



**Ministry of Defence  
Defence Standard 01-5**

**Issue 13 Publication Date January 2002**

**Fuels, Lubricants and Associated  
Products**



**Revision Note**

This Standard has been revised with regards to:

Content Update

**Historical Record**

DG-12 dated July 1968  
DG-12 reprinted December 1972  
DG-12-A (BR 1336/73) dated December 1973  
Def Stan 01-5/Issue 1 dated February 1976  
Def Stan 01-5/Issue 2 dated December 1977  
Def Stan 01-5/Issue 3 dated August 1979  
Def Stan 01-5/Issue 4 dated August 1981  
Def Stan 01-5/Issue 5 dated August 1983  
Def Stan 01-5/Issue 6 dated November 1985  
Def Stan 01-5/Issue 7 dated April 1988  
Def Stan 01-5/Issue 8 dated November 1989  
Def Stan 01-5/Issue 9 dated November 1991  
Def Stan 01-5/Issue 10 dated November 1993  
Def Stan 01-5/Issue 11 dated September 1996  
Def Stan 01-5/Issue 12 dated December 1999

## **PREFACE**

### **Standards for Defence**

#### **Fuels, Lubricants and Associated Products**

- a.** This Standard provides guidance on fuels, lubricants and associated products.
- b.** This Standard has been produced on behalf of the Defence Materiel Standardization Committee (DMSC) by the Joint Petroleum Products Standardisation Committee (JPPSC).
- c.** This Standard has been agreed by the authorities concerned with its use and is to be used wherever relevant in all future designs, contracts, orders etc. and whenever practicable by amendment to those already in existence. If any difficulty arises which prevents the application of the Defence Standard, UK Defence Standardization (DStan) shall be informed so that a remedy may be sought.
- d.** Any enquiries regarding this Standard in relation to an invitation to tender or a contract in which it is incorporated are to be addressed to the responsible technical or supervising authority named in the invitation to tender.
- e.** Compliance with this Defence Standard shall not in itself relieve any person from any legal obligations placed upon them.
- f.** This Standard has been devised for the use of the Ministry of Defence (MOD) and its contractors in the execution of contracts for the MOD. To the extent permitted by law, the MOD hereby excludes all liability whatsoever and howsoever arising (including, but without limitation, liability resulting from negligence) for any loss or damage howsoever caused where the Standard is used for any other purpose.

<u>CONTENTS</u>	<u>PAGE</u>
Preface	1
Introduction	3
Scope	3
WARNING	3
Related Documents	4
Service Authorities	5
Joint Service Designation Products	6
Joint Service Designations (JSD) - Definitions	12
Notes for Guidance	13
Hazard Information	14
International Standardization Agreements	15
Classification of Products	16
Viscosity Classifications	17
SAE Viscosity Classifications	18
ACEA Engine Oil Classification System	19
API Performance Classification	19
API Service Classification System	19
NLGI Classification	20
Classification of Gasolines (Motor)	20
Issuing Authorities	21
NATO Stock Numbers	22
Technical Terms and Abbreviations	23
Product Application Guide	33
Section 1A : OC - Compounded Oils	35
Section 1B : OEP - Extreme Pressure Oils	39
Section 1C : OM - Mineral Oils	51
Section 1D : OMD - Heavy Duty Engine Oils	73
Section 1E : OX - Fluids	85
Section 2 : XG - Greases	117
Section 3 : ZX - Specialities	141
Section 4 : PX - Corrosion Preventives	157
Section 5 : AL - Fluids, WTA and White Spirit	173
Section 6A : Fuels, Aviation Gasolines	189
Section 6B : Fuels, Aviation Turbine Fuels	191
Section 6C : Fuels, Automotive Gasolines	197
Section 6D : Fuels, Diesels	201
Section 6E : Fuels, Furnace Fuel Oils	207
Section 6F : Fuels, Heating and Lighting	213
Section 7 : Reference Fuels	217
Table 1 : NATO Standardized Products	220
Table 2 : Minimum Frequency for Retest of Products	279
Table 3 : Specifications used by the United Kingdom	284
Table 4 : Flash Point Classification of Products	289
Table 5 : Products Obsolete in the United Kingdom	293
Table 6 : Specifications Obsolete in the United Kingdom	300
Table 7 : Obsolete NATO Codes	307
General Index	319
Viscosity / Temperature Characteristics Charts	325

## **FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS**

### Introduction

This Defence Standard lists the standardized products in current use by the Ministry of Defence. In order that fuels, lubricants and associated products are available in all theatres of operations under active service conditions, it is essential that a minimum number of standardized products are specified to meet the requirements of service equipment.

Although many proprietary products may be readily available during the manufacture of equipment, the re-supply of these to users would present unacceptable logistic problems. Furthermore, it is the policy of the Ministry of Defence to use competitive tendering whenever possible and to ensure that all products purchased are of the quality and standard required. This policy is negated if proprietary items are specified rather than standardized products.

If a proprietary product has to be substituted for any of the products listed in this Defence Standard the Service Authority \* shall be consulted. The appropriate contracts branch shall also be advised of the reason for the use of a proprietary item.

Authorities responsible for specifying fuels, lubricants and associated products for current and future applications are to select products from those listed in this Standard. Exceptionally, there may be instances where new products have to be introduced during the development of materiel, in which case reference shall be made to the appropriate Service Authority \* in order that an existing Ministry of Defence Standard may be amended or a new Standard introduced.

### Scope

This Defence Standard provides guidance on the characteristics and uses of fuels, lubricants and associated products for the Ministry of Defence.

### **WARNING**

This Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and in no way absolves either the designer, the producer, the supplier or the user from statutory and all other legal obligations relating to health and safety at any stage of manufacture or use.

\* Note: See page 5

## Related Documents

The following types of documents and publications are referred to in this Standard:

DOCUMENT	SOURCE
British Standards	BSI, Sales Department, 389 Chiswick High Road, LONDON W4 4AL
Defence Standards and DEF Specifications	Directorate of Standardization, Kentigern House, 65 Brown Street, GLASGOW G2 8EX
DEF (AUST)	The Secretariat, Liquid Fuels, Lubricants & Allied Products Committee, c/- Material Research Laboratories, Department of Defence, PO Box 50, ASCOT VALE, VIC 3032
DGS	Abbey Wood Library Building, MOD Abbey Wood #75, PO Box 702, Bristol BS34 8JH
DTD	HMSO Publications Centre, PO Box 276, LONDON SW8 5DT
JSP	CSE Llangennech, Llanelli, Carmarthen, SA14 8YP
IP	Institute of Petroleum, 61 New Cavendish Street, LONDON W1M 8AR
ASTM	American Society for Testing and Materials American Technical Publishers, 27-29 Knowl Piece, Wilbury Way, Hitchin, SG4 0TP
DOD MIL	US Military Specification US Department for Defence
SAE	Society of Automotive Engineers Society of Automotive Engineers Incorporated USA
GP	Canadian Government Specification Board Canadian Department of Defence
VV	US Federal Specification US Department of Defence
STANAG	Focal Point for enquiries, Directorate of Standardization, Stan 2, Kentigern House, 65 Brown Street, GLASGOW G2 8EX
AIR STANDARDS	Def Sys. (NMST), Room 2156, MOD Main Building, Whitehall, LONDON SW1A 2HB

Reference in this Standard to any related documents means in any invitation to tender or contract the edition and all amendments current at the date of such tender or contract unless a specific edition is indicated.

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### Service Authorities

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Service Authorities to be consulted on the use of products listed in this Standard:

#### **Navy**

Systems Fuels & Lubricants  
Manager  
Warship Support Agency (WSA)  
MPS216  
Block J, Foxhill  
Bath BA1 5AB

#### **Army**

Marine and Ground Fuels  
Technical Manager (MGFTM)  
Room 13  
Defence Fuels Group  
West Moors  
Wimborne  
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#### **Air Force**

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**Joint Service Designation Products**

For standardized alternatives with NATO Codes, see Table 1

<b>JSD</b>	<b>Nato Code</b>	<b>Title</b>	<b>Service Authority</b>	<b>Page No.</b>
OC-160	O-254	Lubricating Oil, Compounded: Naval	MPS216	36
OC-300		Lubricating Oil, Gear, Compounded	MPS216	37
OC-600	O-208	Lubricating Oil, Gear, Compounded	MGFTM	38
OEP-30	O-153	Lubricating Oil, Gear: Aircraft, light grade	AFTM	40
OEP-38	O-186	Lubricating Oil, Gear: Extreme pressure, Grade SAE 75W	MGFTM	41
OEP-70	O-155	Lubricating Oil, Gear: Aircraft, medium grade	AFTM	42
OEP-71	O-136	Lubricating Oil, Aircraft Turbine Engine: Petroleum, extreme pressure	AFTM	43
OEP-80		Lubricating Oil, Steam Turbine And Gear: Extreme pressure	MPS216	44
OEP-215		Lubricating Oil, Gear: Helicopter	AFTM	45
OEP-220	O-226	Lubricating Oil, Gear: Extreme pressure, Grade SAE 80W-90	MGFTM	46
OEP-230		Lubricating Oil, Gear: Extreme pressure, Grade SAE 75W-80 (75W-80W)	MGFTM	47
OEP-240		Lubricating Oil, Gear: Extreme Pressure, Limited slip, Grade SAE 80W-90	MGFTM	48
OEP-250		Lubricating Oil, Gear: Extreme Pressure, Grade SAE 80W-140	MGFTM	49
OM-11	O-135	Lubricating Oil, Aircraft Turbine Engine: Petroleum	AFTM	52
OM-12	O-142	Lubricating Oil, General Purpose: Low temperature	AFTM	53
OM-13	O-134	Lubricating Oil, General Purpose: Petroleum, Light	MGFTM	54
OM-15	H-515	Hydraulic Fluid, Petroleum: Superclean	AFTM	55
OM-16	S-756	Insulating Oil: Electrical	MGFTM	56
OM-17		Lubricating Oil: White	MGFTM	57
OM-18	H-520	Hydraulic Fluid, Petroleum: Normal	MGFTM	58
OM-22		Insulating Oil, Electrical: Low pour point	AFTM	59
OM-24		Flushing Oil	MPS216	60
OM-33	H-576	Hydraulic Fluid, Petroleum: Anti-Wear	MPS216	61
OM-58		Lubricating Oil, Petroleum: Compressor, light	MGFTM	62
OM-65	H-572	Hydraulic Fluid, Petroleum: Uninhibited	MPS216	63
OM-70	O-285	Lubricating Oil, Refrigerant Compressor: Uninhibited	MPS216	64
OM-71	O-138	Lubricating Oil, Aircraft Turbine Engine: Petroleum	AFTM	65
OM-100	O-240	Lubricating Oil, Steam Turbine and Gear: Light service	MPS216	66
OM-150		Lubricating Oil, Aircraft Controls: Antifreezing	AFTM	67
OM-160		Lubricating Oil, Petroleum: Compressor medium	MGFTM	68
OM-170		Lubricating Oil, Aircraft Piston Engine: Grade SAE 40	AFTM	69
OM-270		Lubricating Oil, Aircraft Piston Engine: Grade SAE 50	AFTM	70



### Joint Service Designation Products

For standardized alternatives with NATO Codes, see Table 1

<b>JSD</b>	<b>Nato Code</b>	<b>Title</b>	<b>Service Authority</b>	<b>Page No.</b>
OM-750	O-252	Lubricating Oil, Steam Cylinder: Saturated	MPS216	71
OM-1300	O-258	Lubricating Oil, Steam Cylinder: Superheated	MPS216	72
OMD-23		Lubricating Oil, Engine: Two stroke	MGFTM	74
OMD-55	O-1178	Lubricating Oil, Engine: Severe duty, diesel engine service, SAE 5W-30	MGFTM	75
OMD-90	O-1176	Lubricating Oil, Engine: Severe duty, diesel, extended service, SAE 10W-30	MGFTM	76
OMD-113	O-278	Lubricating Oil, Naval Diesel: Severe service	MPS216	77
OMD-140		Lubricating Oil, Engine: Diesel two-stroke, Heavy Duty, Monograde, Grade SAE 40	MGFTM	78
OMD-160		Lubricating Oil, Aircraft Piston Engine: Dispersant base mineral oil, Grade SAE 40	AFTM	79
OMD-162		Lubricating Oil, Multigrade, Aircraft Piston Engine Dispersant, Grade SAE 15W-50	AFTM	80
OMD-250		Lubricating Oil, Aircraft Piston Engine: Dispersant base mineral oil, Grade SAE 50	AFTM	81
OMD-330		Lubricating Oil, Engine: Grade SAE 50	MGFTM	82
OMD-370		Lubricating Oil, Aircraft Piston Engine: Dispersant base mineral oil, Grade SAE 60	AFTM	83
OX-7		Lubricating Oil, Aircraft Turbine Engine: Synthetic 3 cSt	AFTM	86
OX-8	H-542	Brake Fluid, Automotive	MGFTM	87
OX-9	O-148	Lubricating Oil, Aircraft Turbine Engine: Synthetic 3 cSt	AFTM	88
OX-14	O-147	Lubricating Oil, Instrument: Synthetic	AFTM	89
OX-16		Damping Fluid: Silicone base	AFTM	90
OX-18	O-190	Lubricating Oil, General Purpose Preservative, Light	AFTM	91
OX-19	H-537	Hydraulic Fluid, Synthetic, Fire Resistant	AFTM	92
OX-20		Hydraulic Fluid, Phosphate Ester Base	AFTM	93
OX-22	O-291	Lubricating Oil, Marine Gas Turbine Engine: Synthetic type	MPS216	94
OX-24	O-157	Lubricating Oil, Weapons, Small Arms and Light Calibre Weapons	MGFTM	95
OX-26	O-160	Lubricating Oil, Aircraft Gas Turbine Engine: Synthetic 5 cSt	AFTM	96
OX-27	O-156	Lubricating Oil, Aircraft Gas Turbine Engine: Synthetic 5 cSt	AFTM	97
OX-28		Lubricating Oil, Marine Gas Turbine Engine: Synthetic 5 cSt	MPS216	98
OX-29		Lubricating Oil, Synthesized Hydrocarbon	MPS216	99
OX-30		Hydraulic Fluid, Petroleum: Emulsifying	MPS216	100
OX-38	O-149	Lubricating Oil, Aircraft Gas Turbine Engine: Synthetic 7.5 cSt	AFTM	101
OX-40		Hydraulic Fluid, Aqueous Polyglycol Based: Fire resistant	MPS216	102
OX-50	H-536	Hydraulic Fluid, Chlorinated Silicone	AFTM	103

### Joint Service Designation Products

For standardized alternatives with NATO Codes, see Table 1

<b>JSD</b>	<b>Nato Code</b>	<b>Title</b>	<b>Service Authority</b>	<b>Page No.</b>
OX-70	S-1735	Molybdenum Disulphide Lubricating Oil: Silicone base	AFTM	104
OX-72		Lubricating Oil, Stern Tube: Emulsifying	MPS216	105
OX-75	H-548	Hydraulic Fluid, Automatic Transmission	MGFTM	106
OX-79		Transmission Fluid TO-4 (SAE 10W)	MGFTM	107
OX-80		Transmission Fluid TO-4 (SAE 30)	MGFTM	108
OX-85		Transmission Fluid	MGFTM	109
OX-87		Hydraulic Fluid: Aircraft	AFTM	110
OX-95		Lubricating Oil, Compressor: Synthetic	MPS216	111
OX-125		Helicopter Transmission Lubricant	AFTM	112
OX-165		Lubricating Fluid, Gear: Synthetic	MGFTM	113
OX-300		Lubricating Oil, Stern Tube: Emulsifying	MPS216	114
OX-538	H-538	Hydraulic Fluid, Fire Resistant: Low temperature Synthetic Hydrocarbon Base, Aircraft and Missile	AFTM	115
XG-235	G-363	Grease, Plug Valve, Hydrocarbon Resistant	AFTM	118
XG-250	S-736	Silicone Compound: Electrical insulating	AFTM	119
XG-261		Grease, Silicone	MPS216	120
XG-264	G-412	Grease, Graphite: Medium	MGFTM	121
XG-269	G-392	Grease, Aircraft: Synthetic, pneumatic system	AFTM	122
XG-271	G-382	Grease, Aircraft: General purpose	AFTM	123
XG-273		Grease: Synthetic, graphite	AFTM	124
XG-276	G-353	Grease: Synthetic, molybdenum disulfide	AFTM	125
XG-279	G-403	Grease, Automotive and Artillery	MGFTM	126
XG-284	G-366	Grease, Aircraft: Helicopter oscillating bearing	AFTM	127
XG-285	G-355	Grease, Aircraft: Graphite	AFTM	128
XG-286	G-460	Grease, Sea Water Resisting	MPS216	129
XG-287	G-354	Grease: Multipurpose, low temperature range	AFTM	130
XG-291	G-421	Grease: Multipurpose, heavy duty	MPS216	131
XG-293	G-395	Grease, Aircraft: Multipurpose	AFTM	132
XG-294	G-1352	Grease: Multipurpose elevated temperature range	AFTM	133
XG-300	G-372	Grease, Aircraft: Synthetic, high temperature	AFTM	134
XG-305		Grease, Molybdenum Disulphide	MPS216	135
XG-315	G-394	Grease: Silicone, metal to rubber	AFTM	136
XG-344		Grease, Aircraft: High temperature	AFTM	137
XG-380		Grease, Pumpable Calcium Base	MPS216	138
XG-460		Grease, Naval: Graphite	MPS216	139
ZX-9		Cutting Fluid, Soluble, Biostable	MGFTM	142
ZX-13	S-720	Anti-Seize Compound: Graphite	AFTM	143
ZX-21	C 608	Corrosion Preventive Oil, Aircraft Engine: Concentrate	AFTM	144
ZX-24	S-718	Anti-Seize Compound: Aircraft, oxygen system	AFTM	145

### Joint Service Designation Products

For standardized alternatives with NATO Codes, see Table 1

<b>JSD</b>	<b>Nato Code</b>	<b>Title</b>	<b>Service Authority</b>	<b>Page No.</b>
ZX-30		Lubricant, Solid Film: Unbonded, graphite dispersion	AFTM	146
ZX-34	S-1738	Lubricant, Solid Film: Heat cured	AFTM	147
ZX-35	S-740	Molybdenum Disulfide Powder, Lubricating	AFTM	148
ZX-36		Lubricant, Electrical Sleevng	AFTM	149
ZX-38	S-722	Anti-Seize Compound: Molybdenum disulfide	AFTM	150
ZX-40		Grease, Stern Tube: Emulsifying	MPS216	151
ZX-41	S-1712	Damping Fluid: Dimethyl silicone 3 cSt	AFTM	152
ZX-42	S-1714	Damping Fluid: Dimethyl silicone 10 cSt	AFTM	152
ZX-43	S-1716	Damping Fluid: Dimethyl silicone 20 cSt	AFTM	152
ZX-44	S-1718	Damping Fluid: Dimethyl silicone 50 cSt	AFTM	152
ZX-45	S-1720	Damping Fluid: Dimethyl silicone 100 cSt	AFTM	152
ZX-46		Damping Fluid: Dimethyl silicone 500 cSt	MPS216	152
ZX-47		Damping Fluid: Dimethyl silicone 1000 cSt	MPS216	152
ZX-48	S-1724	Damping Fluid: Dimethyl silicone 7500 cSt	AFTM	152
ZX-49		Damping Fluid: Dimethyl silicone 12500 cSt	AFTM	152
ZX-50	S-1726	Damping Fluid: Dimethyl silicone 20000 cSt	AFTM	152
ZX-51		Damping Fluid: Dimethyl silicone 60000 cSt	AFTM	152
ZX-52	S-1728	Damping Fluid: Dimethyl silicone 100000 cSt	AFTM	152
ZX-53	S-1732	Damping Fluid: Dimethyl silicone 200000 cSt	AFTM	152
ZX-54		Compound: Rust penetrating oil	MGFTM	154
ZX-55	S-749	Lubricant: Solid film air drying corrosion inhibiting	AFTM	155
PX-1	C-614	Corrosion Preventive Compound: Soft film, cold application	MGFTM	158
PX-4	C-642	Corrosion Preventive Oil: Thin film	MGFTM	159
PX-6		Petrolatum, Technical: Hard	MPS216	160
PX-7	S-743	Petrolatum, Technical	AFTM	161
PX-11	C-628	Corrosion Preventive: Soft film, hot application	MGFTM	162
PX-13	C-613	Corrosion Preventive Oil, Aircraft Piston Engine: Static preservation, upper cylinder	AFTM	163
PX-15		Corrosion Preventive: Hard film, hot application	MPS216	164
PX-19		Corrosion Preventive Compound: Soft film, grease type	MPS216	165
PX-24	C-634	Corrosion Preventive: Water displacing	AFTM	166
PX-26	C-635	Corrosion Preventive: Hydraulic system	AFTM	167
PX-27	C-615	Corrosion Preventive Oil: Piston metallic	AFTM	168
PX-28		Corrosion Preventive: Undersealing	MGFTM	169
PX-31		Corrosion Preventive Compound: Hard film, cold application	MGFTM	170
PX-32		Corrosion Preventive: Aircraft structures, hard film, transparent, cold application	AFTM	171
PX-36		Corrosion Preventive: Weapon cleaner, lubricant	MGFTM	172



**Joint Service Designation Products**

For standardized alternatives with NATO Codes, see Table 1

<b>JSD</b>	<b>Nato Code</b>	<b>Title</b>	<b>Service Authority</b>	<b>Page No.</b>
AVGAS 100LL		Gasoline, Aviation: Grade 100/130	AFTM	190
AVTAG-FSII	F-40	Turbine Fuel, Aviation: Wide cut type with FSII	AFTM	192
AVCAT-FSII	F-44	Turbine Fuel, Aviation: High flash type with FSII	MPS216	193
AVPIN	S-746	Isopropyl Nitrate	AFTM	194
AVTUR	F-35	Turbine Fuel, Aviation: Kerosene type	AFTM	195
AVTUR-FSII	F-34	Turbine Fuel, Aviation: Kerosene type with FSII	AFTM	196
MTGAS	F-57	Gasoline, Automotive: Lead replacement	MGFTM	198
ULGAS	F-67	Gasoline, Automotive: Unleaded	MGFTM	199
DIESO Military	F-54	Diesel Fuel, Military	MGFTM	202
DIESO UK		Diesel Fuel, General Purpose	MGFTM	203
DIESO MT		Diesel Fuel, General Purpose MT	MGFTM	204
DIESO F-76	F-76	Fuel, Naval Distillate	MPS216	205
3/50 FFO		Fuel, Burner Distillate: Class D	MGFTM	208
36/50 FFO		Fuel, Residual: Boiler, Class E	MGFTM	209
125/50 FFO		Fuel, Residual: Boiler, Class F	MGFTM	210
370/50 FFO		Fuel, Residual: Boiler, Class G	MGFTM	211
KERO/A		Kerosene: Flueless burner, Class C1	MGFTM	214
KERO/B	F-58	Kerosene	MGFTM	215
Stove Naphtha		Naphtha for Cooking Stoves	MGFTM	216

**NOTE** The Service Authority is also shown in bold on the product pages.

## Joint Service Designations (JSD) - Definitions

**OC Compounded Oils** are blends of mineral and vegetable oils only.

**OEP Extreme Pressure Oils** are gear oils containing additives which enhance their ability to withstand extreme gear tooth pressures.

**OF Fatty Oils** are straight vegetable oils.

**OM Mineral Oils** are straight mineral oils or those containing additives intended to improve their performance.

**OMD Heavy-duty Engine Oils** are mineral oil and synthesised hydrocarbon based lubricants containing detergent or dispersant additives primarily designed for use in internal combustion engines.

**OX Fluids** are specialised mineral oil and synthetic fluid based lubricants, hydraulic fluids and damping fluids not covered by other designations and may contain water/glycol.

**XG Greases** are made using thickeners such as those based on calcium, clay or lithium. They may be based on mineral oils, vegetable oils or synthetic fluids and can contain additives such as solid lubricants to improve their performance.

**ZX Specialities** are lubricants, damping fluids and compounds designed for specific applications.

**PX Corrosion Preventives** are used primarily for the prevention of corrosion to metal equipment and are easily removable.

**AL Fluids** are used for engine thrust augmentation, anti-freeze protection, de-icing, cooling, cleaning or similar miscellaneous applications and are mostly water soluble.

## Notes for Guidance

### **Defence Standards, other specifications, NATO Stock Numbers and Service Stores Numbers.**

The issuing authorities for Defence Standards and other specifications, NATO Stock Numbers and Service Stores Numbers, are listed on pages 4, 21 and 22. NATO Stock Numbers quoted on product pages are those current at the date of going to print of this Standard. One specification may cover several closely related products. Specifications currently used by the United Kingdom are listed in Table 3.

### **Technically Acceptable Products List (TAPL).**

Some specifications require Product Conformity Certification (PCC) of products, see page 29, and where applicable this is indicated on the relevant product page. Technically acceptable products are shown on a Technically Acceptable Product List (TAPL) which is available from the relevant Service Authority, see page 5.

**WARNING:** Products used in submarines are subject to toxicity assessment as required by BR 1326 (A) – Materials Toxicity Regulations (Submarines). Qualified Products Lists (QPLs) for MOD UK specifications have been cancelled and are no longer available.

### **Characteristics.**

Only the main characteristics of products are given. Whenever possible an indication is given of the temperature range applicable to the use of the product, or where relevant, the operating temperature range of the equipment. The full specification and appropriate authority shall be consulted when further details are required.

### **Technical Terms and Abbreviations.**

The glossary of technical terms and abbreviations on pages 23 to 32 is one of simplicity and brevity and is intended to assist users unfamiliar with the subject. For scientifically exact information the appropriate text books should be consulted.

### **Standardized Products.**

Internationally agreed products used by NATO, Australia and New Zealand, and the degree of standardization is shown, on page 222 and Table 1. Only in the case of fully standardized products can it be assumed that the products of all countries are interchangeable.

### **New, Obsolete and Obsolescent Products.**

The introduction into Service use of new product types should, whenever possible, be at the expense of existing product types.

Early information on impending changes will assist the work of the Joint Petroleum Products Subcommittee. Obsolete products are not included in Sections 1 to 7 but are listed separately in Table 5. Obsolete specifications are listed in Table 6.

Obsolescence is a stage in the removal of a product from Service use and does not mean that a product is no longer available. While there is an equipment requirement for a product, that product may continue to be used.

### Hazard Information.

For advice on this subject see the MOD Hazardous Stores Information System (HSIS).

#### **Related Documents**

Health and Safety at Work, etc Act 1974  
The Environmental Protection Act 1990  
The Chemical Hazard Information Packaging for Supply Regulations  
JSP 442 Accident Reporting System  
JSP 335 Dangerous Air Cargo Regulations  
JSP 418 Environment Manual  
JSP 424 Guidance Notes for COSHH Assessors  
JSP 327 Manual of Movements  
JSP 375 MOD Health and Safety Handbook  
JSP 437 Personal Protective Equipment Catalogue  
JSP 341 Road Transport Regulations  
JSP 317 Storage and Handling of Petroleum, Oils and Lubricants  
JSP 445 Transport of Dangerous Goods by Road, Rail and Sea  
MoD HSIS Hazardous Stores Information System: MoD Safety Data Sheets on CD-ROM.

For further information contact:

#### **Navy (DLO SEA)**

##### **Focal Node:**

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#### **Army (DLO LAND)**

##### **Focal Node:**

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## International Standardization Agreements.

### **NATO STANAGS:**

- Product Specifications complying with the STANAG are indicated by an asterisk and footnote on the appropriate Product Page
- 1110 Allowable Deterioration Limits for NATO Armed Forces Fuels and Lubricants
  - 1135 Interchangeability Chart of NATO Standardized Fuels, Lubricants and Associated Products, Annex C, reflected in table 1 of this Defence Standard
  - 1385 Guide Specification for Naval Distillate Fuels (F-75 and F-76)
  - 1414 Guidelines to Ensure that Contractors Design and Supply New Equipment Capable of using Standardized Fuels, Lubricants and Associated Products
  - 1425 Guide Specification (Minimum Quality Standard) for Lubricating Oil, Steam Turbine and Gear, Light Service (O-240)
  - 3149 Minimum Quality Surveillance of Petroleum Products Implemented by Service Instructions
  - 3390 Inspection Standards for Fuel Soluble Corrosion Inhibitors. Implemented by Def Stan 68-251 (DERD 2461)
  - 3747 Guide Specification, (Minimum Quality Standards) for Aviation Turbine Fuels F-34, F-40 and F-44. Implemented by Def Stans 91-86, 91-87 and 91-88 (DERD 2452, 2453 and 2454)
  - 3748 Guide Specifications for Hydraulic Fluids, Petroleum, H-515 & H-520 Implemented by Def Stan 91-48
  - 4362 Fuels for Future Ground Equipments using Compression Ignition or Turbine Engines.  
This STANAG is also the implementing document in the UK. It requires that all ground equipment powered by compression ignition and turbine engines shall be capable of operating on kerosene type aviation fuel such as F-34
  - 7036 Fuels to be Introduced into and Delivered by the NATO Pipeline System (NPS)
  - 7063 Methods of Detection and Treatment of Fuels Contaminated by Micro Organisms
  - 7071 Design and Performance Criteria for Aviation Fuel Additive Injection Equipment
  - 7090 Guide Specification for NATO Ground Fuels
  - 7091 Guide Specification for NATO Army Heavy Duty Engine and Transmission Oils
  - 7092 Guide Specification for NATO Army Automotive and Artillery Greases
  - 7093 Guide Specification for NATO Army Automotive Fluids
- Note: The above list is not comprehensive, but includes those STANAG'S considered to be of main interest to users of this Standard.

## **Air Standardization Co-Ordinating Committee (ASCC) Air Standards:**

- 15/3 Minimum Quality Surveillance for Petroleum Products  
Implemented by Service Instructions
- 15/6 Guide specification (Minimum Quality Standards) for Aviation Fuels:  
NATO F-34, F35, F-40 and F-44
- 15/9 Interchangeability Chart of Standardized Fuels, Lubricants and Allied Products  
Implemented by Service Instructions

### **Classification of Products**

#### **Joint Service Designations**

Joint Service Designations (JSD) are allocated to products by the JPPSC and consist of a group of two or three letters followed by a number. The significance of the letter groups is explained below.

In some instances the JSD for oils indicates the approximate viscosity at 40°C in millimetres squared per second, centistokes,  $\text{mm}^2/\text{s}$  (cSt); thus OM-33 indicates a mineral oil of 33  $\text{mm}^2/\text{s}$  (cSt) at 40°C.

Designations for fuels give some indication of the use for which the product is intended or may be an approved abbreviation of the product name.

## Viscosity Classifications

The International System of Units, SI, classification of viscosity is based on a rationalized form of the metric system. The SI unit for kinematic viscosity equivalent to the centistoke (cSt) is millimetres squared per second ( $\text{mm}^2/\text{s}$ ). Where appropriate, both units are shown in this Standard, for example:

Viscosity at 40°C . . . . . 70–75  $\text{mm}^2/\text{s}$ (cSt)

The ISO classification of viscosity is issued by the International Organisation for Standardization (ISO) as International Standard ISO 3448, BS 4231. The system classifies industrial lubricating oils into ranges by their nominal kinematic viscosity at 40°C. Each range is identified by an ISO VG (viscosity grade) number which corresponds to the mid-point viscosity of its range in centistokes:

ISO viscosity grade number, (ISO VG)	Mid point viscosity at 40°C, cSt	Kinematic viscosity limits at 40°C, cSt	
		Min.	Max.
2	2.2	1.98	2.42
3	3.2	2.88	3.52
5	4.6	4.14	5.06
7	6.8	6.12	7.48
10	10	9.00	11.0
15	15	13.5	16.5
22	22	19.8	24.2
32	32	28.8	35.2
46	46	41.4	50.6
68	68	61.2	74.8
100	100	90.0	110
150	150	135	165
220	220	198	242
320	320	288	352
460	460	414	506
680	680	612	748
1000	1000	900	1100
1500	1500	1350	1650

## SAE Viscosity Classifications

The American Society of Automobile Engineers (SAE) Classifications of Engine and Gear Oils are made on the basis of viscosity characteristics only, they consist of numerical series, one for engine oils and another for gear oils. The two series are not related and are such that an engine oil and a gear oil that have the same viscosity when measured by a Standard Method will have a totally different SAE number.

Where the SAE number includes the letter W (Winter grade) two limiting values for viscosity are given, the first, a maximum value at the specified lower temperature and the second, a minimum at the specified higher temperature.

When an SAE classification is shown with two numbers eg, SAE 10W/30, this indicates that the oil is a multigrade and has the viscosity equivalent to the "W" grade when determined at the lower temperature and the viscosity characteristics of the non "W" grade at operating temperatures.

In some circumstances, SAE numbers are used incorrectly to classify other types of lubricating oil. This practice should not be followed as the oil so classified may not necessarily meet all the viscosity requirements for the given number. Lubricating oils other than automotive oils should be classified in accordance with the ISO VG Classification as shown on page 17.

### Engine Oils

SAE Number	Viscosity Range		
	Centipoise	Centistokes at 100°C	
	Max	Min	Max
0W	6 200 at -35°C	3.8	-
5W	6 600 at -30°C	3.8	-
10W	7 000 at -25°C	4.1	-
15W	7 000 at -20°C	5.6	-
20W	9 500 at -15°C	5.6	-
25W	13 000 at -10°C	9.3	-
20		5.6	9.3
30		9.3	12.5
40		12.5	16.3
50		16.3	21.9

## Gear Oils

SAE Viscosity Grade	Maximum Temperature for Viscosity of 150,000cP <sup>(1),(2)</sup>	Kinematic Viscosity at 100°C, cSt <sup>(3)</sup> Minimum <sup>(4)</sup>	Kinematic Viscosity at 100°C, cSt <sup>(3)</sup> Maximum
70W	-55 <sup>(5)</sup>	4.1	—
75W	-40	4.1	—
80W	-26	7.0	—
85W	-12	11.0	—
80	—	7.0	<11.0
85	—	11.0	<13.5
90	—	13.5	<24.0
140	—	24.0	<41.0
250	—	41.0	—

Note: 1 cP = 1 mPa.s: 1cSt = 1 mm<sup>2</sup>/s

1. Using ASTM D 2983
2. Additional low-temperature viscosity requirements may be appropriate for fluids intended for use in light-duty synchronized manual transmissions. See text.
3. Using ASTM D 445
4. Limit must also be met after testing in CEC L-45-T-93, Method C (20 h).
5. The precision of ASTM D 2983 has not been established for determinations made at temperatures below -40°C. This fact should be taken into consideration in any producer-consumer relationship.

### ACEA (European Automobile Manufacturers Association) Engine Oil Classification System

1. This system specifies performance levels of a lubricant in spark and compression engines.
2. It comprises three categories covering:
  - Passenger car gasoline - A
  - Light duty diesel - B
  - Heavy duty diesel - E

### API Performance Classification

Defines a level of performance of a lubricant in spark and compression ignition engines by the oil.

### API Service Classification System

1. API Engine Service Classification System

This system rates Crankcase Oils in relation to their performance in selected engines operated under controlled conditions.

The details of the system and classification are published in the API Bulletin 1509 'Engine Service Classification and Guide to Crankcase Oil Selection'.

The classification is divided into two series: S for mainly gasoline engines and C for mainly diesel engines, the performance level for each series is identified by a second letter eg SC or CD. In cases where an oil has a joint classification the letter grouping for the primary application is given first, eg CD/SF would be a lubricant formulated for diesel application but suitable for use in gasoline engines up to SF service requirements.

## 2. API Service Designation for Automotive Gear Oils

The service designation covers five groups of products (GL-1 to GL-5) for use in axles and manual transmissions only.

The various types and applications are fully described in the API Bulletin No. 1560.

### **NLGI Classification**

The NLGI classification of greases is issued by the American National Lubricating Grease Institute. It indicates the consistency, ie the degree of hardness of greases, in terms of their worked penetration at 25°C.

NLGI Number	Worked penetration at 25°C
000	445–475
00	400–430
0	355–385
1	310–340
2	265–295
3	220–250
4	175–205
5	130–160
6	85–115

### **Classification of Gasolines (Motor)**

The British Standard Institute publish two specifications which cover the classification of unleaded motor gasoline.

Unleaded gasoline is classified in both BS EN 228 and BS 7800. BS EN 228 covers both premium and regular grades. BS 7800 covers high octane (Super) grade. The minimum anti-knock values in terms of RON and MON values are given below.

Grade	RON	MON
High Octane (Super Unleaded)	97	86
Premium	95	85

Leaded gasoline is no longer available under EU Directive and Lead Replacement Petrol (LRP) is available in its place. There is no formal specification for LRP, however the UK petroleum industry have agreed to supply with an exhaust valve seat protection additive and with the following Research Octane Number (RON) and Motor Octane Number (MON) requirements:

Grade	RON	MON
LRP	97	86

## Issuing Authorities

### **Service Stores Numbers**

Service Store or Stock Numbers normally consist of the NATO Stock Number for the Army or the Service Management Code followed by the last seven digits of the NATO Stock Number for the RAF and RN. In the case of the RAF the number is not hyphenated.

To avoid unnecessary repetition of these numbers, only the Service Management Code is shown in the relevant Service column opposite the appropriate NATO Stock Number, but it must be understood that the full Service Stores Number will include the whole part of the NATO Stock Number stated above. Some single Service products may be accounted for by a domestic number during the introductory period.

Service Store or Stock Numbers are issued by the following Authorities:

Management Code	Issued by
0442, 0473 and 0475	Defence Fuels Group
0721, 0722, 0723 and 0725	Defence Fuels Group
34A, B, C or D	Defence Fuels Group

### **Specifications**

The current validity of any specification can only be ascertained by consulting the relevant Service Authority. Some specifications group two or more products under the same number (see page 4, Related Documents).

The use of proprietary products in the Services is defined by various Service Authorities. See the appropriate Product Page, or refer to the relevant Service Authority listed on page 5.

### **NATO Stock Numbers**

Each NATO Stock Number and/or its equivalent Service Stores Number relates to a product in a particular size of container. These container sizes are nominal and in practice the quantity in the container is specified. A double dash sign -- in a Service column indicates that the product is not stocked by that Service. A double plus sign ++ in a Service column indicates that the product is stocked by the Service but has not been allocated a Service Management Code. Aviation products may not be held by all Army depots.

### **NATO Codes**

NATO Codes are allocated to NATO Standardized Products by the Military Agency for Standardization, NATO. They consist of an index letter followed by a number, eg O-134. The NATO Code is enclosed in a rectangle when applied as an identification for marking on containers, dispensing equipment and installations.

### **Interchangeability of Standardized Products**

See page 222 and Table 1.



## Technical Terms and Abbreviations

Note: At the suggestion of users of this Standard, a simplified explanation of the technical terms contained therein is given below. These definitions are intended to assist those unfamiliar with the subject and are confined to meanings within the context of this Standard. For exact definitions the appropriate text books should be consulted.

**ACEA.** European Automobile Manufacturers Association.

**Acidity.** The acidity of petroleum products is measured in terms of the amount of alkali required for neutralization under prescribed conditions.

**Additive.** A substance added to a product in a small proportion in order to achieve desired characteristics.

**Alcohol.** A compound of carbon, hydrogen and oxygen in which each atom of oxygen is linked to one of carbon and one of hydrogen, eg methanol and glycol.

**Aniline point.** The lowest temperature at which a hydrocarbon fluid is completely miscible with an equal volume of aniline. A high reading points to a low aromatic content and less effect on rubbers.

**Antifreeze agent.** A substance added to water to reduce its freezing point, eg ethylene glycol used in engine coolants.

**Antiknock agent.** A substance which increases the resistance to detonation of a spark ignition engine fuel. See also tetraethyl lead and tetramethyl lead.

**Anti oxidant.** See oxidation inhibitor.

**Antiwear additive.** A substance which by surface activity increases the resistance of lubricating films to disruption.

### **API. American Petroleum Institute**

**Aromatics.** Hydrocarbons of ring structure having the smallest hydrogen to carbon ratio.

**Ash.** The inorganic residue left after combustion under specified conditions. See also sulfated ash.

**Asphaltenes.** That proportion of a petroleum product which is soluble in aromatic solvent but insoluble in a petroleum spirit.

**Autogenous ignition temperature.** Auto ignition or spontaneous ignition temperature. The lowest temperature at which ignition of a flammable mixture of vapour and air occurs when tested under standard conditions.

**Bitumen.** A black solid or semi solid obtained as the end product from distillation of certain crude oils.

**Bleeding.** Separation of oil from grease during storage.

**Blown oil.** An oil which has had air blown through it to increase its viscosity or to alter properties.

**BOCLE.** Ball on cylinder evaluator

**Bromine number.** Number of centigrams of bromine which are absorbed by 1g of oil. It provides a measure of the amount of unsaturated material in a fuel and to some extent its storage stability.

**Bulk modulus.** The reciprocal of the compressibility of an oil.

**Carbonizable substances.** Impurities occurring in white oils identified by treatment with sulfuric acid.

**Carbon residue.** The mass of carbon left when an oil or fuel is destructively distilled in the absence of air.

**Centipoise,** mPa.s(cP), Unit of dynamic viscosity.

**Centistokes, cSt.** See Kinematic viscosity.

**Cetane Index.** A means of estimating the cetane number of distillate fuels.

**Cetane number.** A measure of the ignition quality of a diesel fuel. The higher the number the better the ignition quality.

**Channelling test.** Used for testing gear oils, in which a groove cut in the partly congealed oil at a specified temperature must collapse to a given extent within a stated number of seconds.

**Char value.** The mass of carbonaceous matter formed on a wick after a specific amount of burning oil has been burnt in a special lamp under standard conditions.

**Cloud point.** The temperature at which a cloud or haze begins to appear when an oil, which has been previously dried, is cooled under prescribed conditions. Such cloud is usually due to the separation of paraffin wax.

**Cold Filter Plugging Point (CFPP).** A measure of the ability of diesel fuels to operate at reduced temperatures. The lower the temperature quoted the lower the temperature at which the fuel can be used. This will generally be slightly higher than the CFPP.

**Cold test.** Used herein to mean the lowest temperature at which the substance will flow when observed under specified conditions not identical with those of the pour point test.

**Colloidal suspension.** A mixture of a solid in finely divided form and a liquid in which the solid is prevented from settling out of its extremely fine dispersion or by the presence of deflocculating agent.

**Compounded oil.** A blend, usually of fatty oil with mineral lubricating oils.

**Consistency.** A measure of the degree of hardness of a grease, see Penetration.

**Corrosion inhibitor.** An additive which reduces the corrosive properties of a product, or guards against the corrosive effects of contaminants which may be present in the product.

**Crackle test.** Gives an indication of the presence of moisture by the crackling sound emitted when an oil is heated in a test tube.

**Demulsification number.** A measure of the ability of an oil to separate from an oil/water emulsion. Time in seconds for separation of an emulsion of water and oil formed by injecting steam into the oil under prescribed conditions. Ranges from 30 to 1200 plus.

**Density.** The mass of product per unit volume at a specified temperature. For petroleum products this is usually reported in grams/centimetre<sup>3</sup> at 15°C.

**Detergent additive.** A substance which when dissolved in lubricating oil reduces the adhesion between solid particles, eg of gummy or carbonaceous matter and metals. Largely used to minimize persistent gumming of piston rings in heavy duty diesel engines. Most detergent additives produce a slight increase in load carrying capacity but tend to promote oxidation. To counteract this, anti oxidant additives are usually incorporated.

**Diesel fuel.** A petroleum product particularly suitable for use in compression ignition engines. Its viscosity and distillation range, approx 180 to 380°C, are generally intermediate between those of kerosene and light lubricating oil.

**Diesel index.** A figure indicating the ignition quality of a compression ignition engine fuel. It is a calculated value obtained from the aniline point and specific gravity of the product as distinct from the cetane number which is determined by engine tests.

**Dispersant additive.** A substance which when dissolved in lubricating oil keeps low temperature sludges dispersed.

**DoD.** Department of Defense

**Dropping point.** Temperature at which the first drop falls from grease as melting begins under specified conditions.

**Dynamic viscosity.** The dynamic viscosity of a fluid is defined as an indication of its ability to flow.

**Electric strength.** The AC voltage required to initiate an arc between two electrodes immersed in insulating oil or the like at a stated distance apart.

**Electrostatic dissipator additive.** See Static dissipator additive.

**Emulsion.** A dispersion of very small globules of one liquid in another.

**Endurance life.** As applied to solid film lubricants, that point at which the film is no longer providing acceptable friction and wear properties.

**Esters.** Compounds of alcohols and fatty acids which form the major constituents of many synthetic lubricating oils.

**Evaporation loss.** The loss in mass of an oil or grease, after heating under specified conditions.

**Extreme Pressure Additive (EP).** An oil soluble compound of sulfur, chlorine or other active element which releases that element at the very high temperature reached at points on incipient scuffing between the hardened steel surfaces of, for example, hypoid gears. The active element combines with iron and prevents welding which otherwise would lead to tearing of the surfaces. Oils containing these additives are not suitable for indiscriminate use.

**Fatty oils.** Ester of animal, fish or vegetable origin as distinct from mineral or synthetic oil.

**Fire point.** The lowest temperature at which an oil vaporizes rapidly enough to burn for at least five seconds after ignition, under standard conditions.

**Fuels, Lubricants and Associated Products (F & L).** Petroleum fuels, lubricants, hydraulic and insulating oils, temporary protectives, liquid coolants, windscreen washing fluids, deicing and antifreeze compounds together with components and additives for such products.

**Flash point.** Lowest temperature at which a substance gives off enough vapour under stated conditions, using a closed or open vessel, to ignite momentarily when a flame is applied. Flash point is in no way related to autogenous ignition temperature, which is, for example, higher for petrol than for lubricating oil.

**Flock point.** Flocculation value is a measure of the tendency of a lubricant to precipitate wax or other solids from a solution under specified conditions.

**Freezing point.** The temperature at which crystals formed on cooling, disappear when the temperature of a liquid is allowed to rise.

**Fuel System Icing Inhibitor (FSII).** A fuel additive to prevent ice crystals forming when water is present.

**Gas oil.** A petroleum distillate having a viscosity and distillation range intermediate between those of kerosene and light lubricating oil. Distillation range normally falls within 200 to 380°C. Used as a fuel for high speed diesel engines and as a burner fuel in heating installations.

**Gasoline (petrol).** A refined petroleum distillate of high volatility used in spark ignition engines, normally boiling within the range 30 to 220°C.

**Graphite.** A form of carbon with a flaky structure and good lubricating properties.

**Heat of combustion.** Thermal value of specific energy, a measure of the available energy in a fuel.

**Heavy Duty Oil (HD).** Oil containing detergent, anti oxidant and other additives to render it suitable for heavy duty diesel engines.

**Hertz load.** The Mean Hertz Load (load wear index) is derived from a series of wear measurements at graded loads, up to complete seizure, with an apparatus comprising four standard steel balls pressed together in pyramid form, the lower three being fixed whilst the upper one rotates against them,

**Hydrocarbons.** Compounds of carbon and hydrogen only.

**Iodine value.** The number of grams of iodine absorbed by 100 grams of the product. It gives an indication of the amount of unsaturated acids present in the product.

**Jet A** A grade of, kerosene type, aviation turbine fuel to Specification ASTM D1655. Freezing point minus 40°C max.

- Jet A-1** A grade of, kerosene type, aviation turbine fuel to Specification ASTM D1655. Freezing point minus 47°C max. Similar to AVTUR.
- Jet B** A wide cut type aviation turbine fuel to Specification ASTM D1655. Freezing point minus 50°C max.
- JP** Prefix used in US military specifications to denote different types of aviation turbine fuels, in common use as follows:
- JP-1** Obsolete aviation turbine kerosene similar to AVTUR but with a lower freezing point (-60°C max).
- JP-2** Obsolete experimental wide range distillate fuel.
- JP-3** A wide cut gasoline type fuel formerly used by USAF, now replaced by JP-4.
- JP-4** A wide cut gasoline type fuel. Specification MIL-T-5624, interchangeable with AVTAG/FSII, NATO F-40.
- JP-5** Aviation kerosene, high flash point type, for shipborne aircraft. Specification MIL-T-5624, interchangeable with AVCAT/FSII, NATO F-44.
- JP-6** Obsolete experimental kerosene type fuel of high thermal stability.
- JP-7** A kerosene type fuel of low volatility and high thermal stability. Specification MIL-T-38219.
- JP-8** Aviation kerosene, Specification MIL-T-83133 (F-34), interchangeable with AVTUR/FSII, NATO F-34.
- JP-8 + 100** Aviation kerosene, Specification MIL-T83133(F-34), interchangeable with AVTUR/FSII, NATO F-34 plus a high temperature thermal stability additive and designated F-37.
- JP-9** A high density hydrocarbon fuel composed of three different components. Specification MIL-P-87107. Intended for use in special applications.
- JP-10** A high density hydrocarbon fuel composed solely of exo-tetrahydrodi (cyclopentadiene). Specification MIL-P-87107. Intended for use in special applications such as ramjets.
- JP-TS** A kerosene type fuel of low distillation end point (260°C) and high thermal stability. Specification MIL-T-25524.

**Kerosene.** A refined petroleum distillate intermediate in volatility between gasoline and gas oil. Its distillation range is normally between 150 and 300°C.

**Kinematic viscosity.** The dynamic viscosity divided by density and measured as  $\text{mm}^2/\text{s}(\text{cSt})$ .

**Knock rating.** A measure of the detonation resistance of a spark ignition engine fuel. See also octane and performance numbers.

**Lanolin.** A substance extracted from sheep's wool. It has useful anti corrosion properties and is used in certain temporary protectives.

**Lead Scavenger.** A compound added to spark ignition engine fuels to remove the lead from the cylinders which would otherwise be left behind by the leaded antiknock agents.

**Light absorption.** The extent to which radiated light is absorbed in passing through a layer of an absorbing liquid. This is a measure of the purity of white oils.

**LPG.** Liquefied petroleum gas, eg butane, propane.

**Load carrying additive.** An antiwear or extreme pressure additive.

**Load wear index.** See Hertz load.

**LRP.** Lead replacement petrol. Petrol in which anti-wear additives have replaced lead. Not for marine two-stroke use.

**Mercaptan sulfur.** A corrosive organic sulfur compound that occurs in crude oil. Normally removed by the refining process.

**Microcrystalline wax.** Wax obtained from certain petroleum residues, the crystalline structure of which is not visible to the naked eye.

**Mineral jelly.** Petrolatum.

**Molybdenum disulphide.** A naturally occurring mineral with a flaky structure and good lubricating properties.

**Motor Octane Number (MON).** A term used to indicate the octane number obtained under specified operating conditions in the assessment of gasolines.

**Multigrade oil.** A lubricating oil having the combined viscosity characteristics of two single grades of oil. For example, an SAE 10W/30 engine oil has the low temperature advantages of an SAE 10W oil and the high temperature advantages of an SAE 30 oil.

**Naphtha.** See Petroleum naphtha.

**Octane number.** A measure of the antiknock quality of a gasoline. The higher the number the greater the resistance of the fuel to knock. See Motor Octane Number and Research Octane Number.

**Oil mist coking propensity.** The tendency of a hot air/oil mist mixture to form deposits when impinging on a hot static metal surface.

**Oil separation.** See bleeding.

**Olefins.** Hydrocarbons of ethene series which contain a double bond ethylene and are more reactive than paraffins.

**Oxidation inhibitor.** An additive which reduces the rate of oxidation and subsequent deterioration of fuels and lubricants.

**Oxidation stability.** A measure of the resistance of a product to oxidation.

**PAO.** Polyalphaolefin. Synthesized hydrocarbons.

**Paraffins.** Hydrocarbons of the methane series which are indifferent to oxidizing agents and are less reactive than olefins.

**Penetration.** A measure of the consistency of a grease. Higher the number the softer the grease.

**Performance Number (PN).** A figure used to indicate the knock rating characteristics of aviation gasolines in the region above 100 octane.

**Petrolatum, mineral jelly or petroleum jelly.** A soft gel mixture of oil and wax obtained from petroleum.

**Petroleum naphtha.** Distillate boiling in the gasoline range.

**Petroleum, Oils, and Lubricants (POL).** A term which has been used by the Armed Forces but more commonly referred to as Fuels and Lubricants, F & L.

**Petroleum spirit.** Narrow boiling range petroleum distillates of high volatility, eg petroleum spirit 60/80.

**pH value.** A measure of acidity or alkalinity. pH 7 = neutral, pH 0 = extreme of acidity, pH 14 = extreme of alkalinity.

**Pour point.** The lowest temperature at which an oil moves under specified conditions. Oils can often be pumped at temperatures below pour point, but gravity flow into the pump may fail.

**Pour point depressant.** An additive which lowers the pour point by modifying the crystal formation of traces of dissolved wax.

**Power factor.** A measure of the energy loss in insulating compounds or oils due to the presence of electrolytes.

**Precipitation number.** A measure of the insoluble asphaltic materials which may be present in an oil.

**Product Conformity Certification (PCC).** PCC is certification that a product meets its specification. The certification can be undertaken by the supplier or a third party, depending on the needs of the project manager or equipment support manager and the assessment of the risks involved. PCC will be implemented by the relevant Standard. This will normally be invoked where airworthiness or confined atmospheres (e.g. submarines) are involved.

(See page 13 Notes for Guidance and also Technically Acceptable Products List (TAPL)).

**PSN.** IMO Proper Shipping Name

**Pumpability.** The ability of any liquid, slurry or suspension to be moved through a flow conduit tube.

**Reactive sulfur.** A form of sulfur added to certain metal working lubricants to provide extreme pressure lubrication by chemical action during machining under heavy duty conditions.

**Redwood viscosity.** An obsolescent viscosity rating. The relationship between Redwood viscosity in Redwood Seconds No 1, RS1, and centistokes is shown in the charts at the end of this Standard.

**Refractive index.** The ratio of velocity of light in air to its velocity in the material under test. It is used as a measure of purity of the substance.

**Reid Vapour Pressure (RVP).** The vapour pressure of a fuel at 37.8°C measured in a standard apparatus. It provides a measure of ease of starting and vapour locking tendency at high temperatures or high altitudes.

**Relative density.** The ratio of the mass of a given volume of a substance to the mass of an equal volume of pure water.

**Research Octane Number (RON).** A term used to indicate the octane number obtained under specified operating conditions in the assessment of motor gasolines. The research numbers obtained are higher than the Motor Octane Numbers but there is no direct relationship between the two figures. See also Motor Octane Number.

**Roll stability.** The ability of a grease to withstand shear breakdown when subjected to the milling action of a roller contained within a cylinder.

**RS1.** See Redwood viscosity.

**SAE. Society of Automobile Engineers.**

**Saponification value.** Saponification number is a measure of the quantity of fatty materials compounded in an oil. Zero value indicates no fatty materials have been added.

**Saybolt viscosity.** A measure of viscosity as used in the USA.

**SFC.** NATO's Single Fuel Concept. STANAG 4362

**Shear breakdown.** Breakdown of molecules into smaller molecules by shearing forces.

**Shear stability.** Resistance of a lubricant to shear breakdown.

**SI units.** The International System of Units, Systeme International, d'Unites, is a rationalized form of the metric system and employs seven base units from which most quantities can be derived in all technologies.

**Silicone fluids, siloxanes.** Synthetic lubricant containing silicon and oxygen in addition to carbon and hydrogen.

**Silting index.** A measure of the filter blocking tendency of a fluid.

**Single Fuel Concept (SFC).** The use of aviation fuel F-34 / F-35 for all land-based equipment, STANAG 4362 (F-34 with multi-fuel additive S-1750 is designated as F-63).

**Smoke point.** The maximum height of a flame at which a fuel will burn without smoking when tested in a standard lamp.

**Specific energy.** See Heat of combustion.

**Specific gravity.** Obsolescent term. See Relative density.

**Specific heat.** The ratio of the thermal capacity of a material to that of water at a specified temperature.



**Spontaneous ignition temperature.** See Autogenous ignition temperature

**Static Dissipator additive.** An electrostatic dissipator additive. An additive that increases the electrical conductivity of liquid fuels, permitting electrostatic charges to dissipate rapidly.

**Sulfated ash.** The residue remaining after the ash from an ignited sample is treated with sulfuric acid. Generally taken to indicate the concentration of organo-metallic additives in the original sample.

**Surface active materials, surfactants.** Additives or contaminants which impart surface energy properties. They lower surface tension, thereby increasing wetting and spreading power.

**Surface tension.** The 'skin effect' which causes liquids to gather into droplets instead of spreading.

**SUS.** See Saybolt viscosity.

**Synthetic lubricants.** Lubricants prepared by a chemical process as distinct from normal petroleum refinery processes.

**Technically Acceptable Products List (TAPL).** See page 13 Notes for Guidance and also Product Conformity Certification.

**Tetraethyl Lead (TEL).** A liquid organic lead compound added in small proportions to gasoline to improve knock rating.

**Tetramethyl Lead (TML).** A liquid organic lead compound added in small proportions to gasoline to improve knock rating.

**Thermal value.** See Heat of combustion.

**Thixotropy.** Property of certain gel like substances to behave as liquids when agitated or stirred, but which on resting, return to their normal state.

**Thrust augmentation fluid.** A fluid, introduced into an engine to permit an increase in its power outputs for short periods.

**Total Acid Number (TAN).** A measure of the total acidity of the product.

**Total Base Number (TBN).** A measure of the ability of the oil to neutralize acidic products of combustion.

**Ultra-low sulfur diesel (ULSD).** See DIESO MT page

**UN number.** A four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods to identify hazardous substances, material and articles considered dangerous for carriage.

**UN packaging group.** Dangerous goods have for packing and transport purposes been apportioned among three categories (Packaging Groups) by the United Nations

Committee of Experts on the Transport of Dangerous Goods according to the degree of danger they present:

Great danger	Packaging Group I
Medium danger	Packaging Group II
Minor danger	Packaging Group III

**Unworked penetration.** Penetration reading taken on a grease which has received a minimum of handling and has not been 'worked'. See Worked penetration.

**Vapour phase inhibitor (VPI).** Corrosion Inhibitor, which when placed in closed systems minimizes corrosion.

**Viscosity.** The property of a liquid offering resistance to shear or flow. Viscosity decreases with increasing temperature as shown in the charts at the end of the Standard. See also Dynamic viscosity and Kinematic viscosity.

**Viscosity, apparent.** The viscosity expressed in poises calculated from measurements at a given rate of shear. The value varies with the shear rate.

**Viscosity Index (VI).** A figure of merit, rating highest those products in which viscosity is least affected by change of temperature.

**Viscosity index improvers.** An additive which reduces the effect of temperature on the viscosity of an oil.

**Water reaction test.** A test which detects the presence of water miscible components in fuels, and the effect of these components on the fuel water interface.

**Water Separation Index, Modified (WSIM).** A numerical rating indicating the ease with which a fuel will release entrained or emulsified water when passed through a coalescing medium.

**Worked penetration.** A penetration reading taken on a grease immediately after it has been forced repeatedly through small holes in a plate. See Unworked penetration.

**Water Thrust Augmentation (WTA).** See thrust augmentation fluid.

## Product Application Guide

Products listed below have been grouped by their main function to provide guidance on the selection of products to equipment manufacturers and authorised service departments. Some products listed are multi-functional, for example OMD-90, which may also be used as a transmission fluid and in hydraulic applications in addition to its principle function as a piston engine lubricant. Further advice should be sought from the service authority shown on Page 5.

### Propulsion Lubricants

Piston Engine	OM-170, OM-270, OMD-23, OMD-55, OMD-90, OMD-113, OMD-140, OMD-160, OMD-162, OMD-250, OMD-330 and OMD-370.
Gas Turbine	OM-11, OM-71, OX-7, OX-9, OX-22, OX-26, OX-27, OX-28 and OX-38.
Steam Cylinder	OM-750 and OM-1300.

<b>Transmission Lubricants</b>	OC-160, OC-300, OC-600, OM-100, OEP-30, OEP-38, OEP-70, OEP-71, OEP-80, OEP-215 and OEP-220, OEP-230, OEP-240, OEP-250, OX-72, OX-75, OX-79, OX-80, OX-85, OX-125, OX-165 OX-300.
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<b>Hydraulic Fluids</b>	OM-13, OM-15, OM-18, OM-33, OM-65, OX-8, OX-19, OX-20, OX-30, OX-40, OX-50, OX-87 and OX-538.
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<b>Compressor Lubricants</b>	OM-58, OM-70, OM-160 and OX-95.
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<b>Greases</b>	XG-235, XG-250, XG-261, XG-264, XG-269, XG-271, XG-273, XG-276, XG-279, XG-284, XG-285, XG-286, XG-287, XG-291, XG-293, XG-294, XG-300, XG-305, XG-315, XG-344, XG-380, XG-460 and ZX-40.
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<b>Solid Lubricants and Anti-seize Compounds</b>	OX-70, ZX-13, ZX-24, ZX-30, ZX-34, ZX-35, ZX-38 and ZX-55.
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<b>Corrosion Preventives</b>	ZX-21, PX-1, PX-4, PX-6, PX-7, PX-11, PX-13, PX-15, PX-19, PX-24, PX-26, PX-27, PX-28, PX-31, PX-32 and PX-36.
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<b>Coolants</b>	AL-20, AL-26, AL-39 and AL-40.
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<b>Cleaning Products and Release Agents</b>	OX-18, AL-36, ZX-54 and White Spirit.
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<b>Cleaners, Lubricants and Protectives (CLP)</b>	OX-24, PX-24 and PX-36.
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<b>Damping Fluids</b>	OX-16, ZX-41, ZX-42, ZX-43, ZX-44, ZX-45, ZX-46, ZX-47, ZX-48, ZX-49, ZX-50, ZX-51, ZX-52 and ZX-53.
<b>De-icers</b>	AL-5, AL-11 and AL-34.
<b>Transformer Oils</b>	OM-16 and OM-22.
<b>Miscellaneous</b>	OM-12, OM-17, OM-24, OM-150, OX-14, OX-29, ZX-9 and ZX-36.
<b>Fuels</b>	
Aviation Gasoline	AVGAS-100LL
Aviation Turbine Fuels	AVTAG-FSII, AVCAT-FSII, AVPIN, AVTUR and AVTUR-FSII.
Aviation Fuel Additives	AL-41, AL-48 and AL-61.
Thrust Augmentation Fluids	AL-14, AL-28 and WTA.
Automotive Gasolines	MTGAS and ULGAS.
Automotive Diesel Fuels	DIESO MILITARY, DIESO UK, and DIESO MT.
Naval Diesel Fuel	DIESO F-76.
Furnace Fuel Oils	3/50 FFO, 36/50 FFO, 125/50 FFO and 370/50 FFO.
Heating and Lighting Fuels	KERO/A, KERO/B and STOVE NAPHTHA.

**SECTION 1A : OC  
COMPOUNDED OILS**

## SECTION 1A : OC-COMPOUNDED OILS

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### NATO O-254

#### OC-160

LUBRICATING OIL, COMPOUNDED: Naval

**Specification:** Def Stan 91-21/3.

**Composition:** Mineral oil, percent ... .. 90  
Blown rape seed oil, percent ... 10

**Characteristics:** Viscosity at 40°C ... .. 145-155 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -18°C  
Flash point, closed cup, min ... 180°C  
Saponification number, min ... 20.5

The specification includes tests for acidity, emulsification properties and stability of emulsion.

**Uses:** For external parts of reciprocating steam engines where emulsification with water is required. Lubrication of radar equipment and stern tubes in work boats.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-942-3148	25 litre	0475	++	34D
9150-99-910-0534	200 litre	0475	--	--

## SECTION 1A : OC-COMPOUNDED OILS

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### OC-300

LUBRICATING OIL, GEAR, COMPOUNDED

**Specification:** Def Stan 91-65/1.

**Composition:** Refined mineral oil blended with unblown rape seed oil to BS 7207 in the following proportions:

Refined mineral oil, percent ... .. 90

Unblown rape seed oil, percent ... .. 10

**Characteristics:** Viscosity at 40°C ... .. 260-300 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C ... .. 20-24 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -24°C  
Flash point, closed cup, min ... .. 176°C

The specification includes tests for density, ash, acidity, copper corrosion, saponification and low temperature stability.

**Uses:** Naval torpedoes and certain Naval and worm reduction gears operated over the temperature range above minus 20°C.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-943-7238	25 litre	0475	--	--

## SECTION 1A : OC-COMPOUNDED OILS

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### NATO O-208

#### OC-600

LUBRICATING OIL, GEAR, COMPOUNDED

**Specification:** Def Stan 91-65/1.

**Composition:** Refined mineral oil blended with unblown rape seed oil to BS 7207 in the following proportions:

Refined mineral oil, percent	...	...	94
Unblown rape seed oil, percent	...	...	6

**Characteristics:**

Viscosity at 40°C	...	...	...	550-600 mm <sup>2</sup> /s(cSt)
Viscosity at 100°C	...	...	...	27-32 mm <sup>2</sup> /s(cSt)
Pour point, max	...	...	...	0°C
Flash point, closed cup, min	...	...	...	240°C

The specification includes tests for density, ash, acidity, copper corrosion, saponification and low temperature stability.

**Uses:** Vehicle transmissions, general gear applications and chassis lubrication, operated over the temperature range above 0°C.

**Note:** This lubricant is not suitable for use with hypoid gears, in automatic transmissions or torque converter drives.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-910-0536	25 litre	0475	++	34D

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**SECTION 1B : OEP  
EXTREME PRESSURE OILS**

## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### NATO O-153

#### OEP-30

LUBRICATING OIL, GEAR: Aircraft, light grade

**Specification:** Def Stan 91-112/1, includes OEP-70.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oil with extreme pressure additives. It may also contain a technically acceptable pour point depressant.

**Characteristics:**

Viscosity at 40°C	...	...	...	28.8–35.2 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	80
Pour point, max	...	...	...	–39°C
Flash point, closed cup, min	...	...	...	126°C
Load carrying capacity,				
Mean Hertz Load, min	...	...	...	50 kg

The specification includes tests for corrosion of copper, steel, additive elements, acid number, base number and storage stability.

**Uses:** Certain aircraft gearboxes and aircraft cannon.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-179-7833	5 litre	--	--	34B

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## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### NATO O-186

### OEP-38

LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 75W

**Specification:** Def Stan 91-59/2, includes OEP-220.\*

**Composition:** Mineral oil with extreme pressure additives. It may also contain a technically acceptable pour point depressant.

**Characteristics:**

Viscosity at 100°C min	...	...	4.1 mm <sup>2</sup> /s(cSt)
Viscosity at -40°C max	...	...	150 000 mPa.s(cP)
Viscosity index, min	...	...	85
Flash point, closed cup, min	...	...	150°C

The specification includes tests for corrosion of copper and steel, storage stability, foaming characteristics, thermal stability and certain gearbox tests.

**Uses:** Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, and fluid lubricated universal joints. It is a substitute for OEP-220 for cold temperature operations below minus 15°C.

**Note:** This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. If the bulk temperature of the oil exceeds 130°C, there is a risk that some decomposition of EP additives may occur.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0538	25 litre	--	++	34D

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\* Note: This product implements STANAG 7091.

## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### NATO O-155

#### OEP-70

LUBRICATING OIL, GEAR: Aircraft, medium grade

- Specification:** Def Stan 91-112/1, includes OEP-30.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.
- Composition:** Mineral oil with extreme pressure additives. It may also contain a technically acceptable pour point depressant.
- Characteristics:**
- |   |     |     |     |     |                                   |
|---|-----|-----|-----|-----|-----------------------------------|
| Viscosity at 40°C                               | ... | ... | ... | ... | 61.2-74.8 mm <sup>2</sup> /s(cSt) |
| Viscosity index, min                            | ... | ... | ... | ... | 80                                |
| Pour point, max                                 | ... | ... | ... | ... | -30°C                             |
| Flash point, closed cup, min                    | ... | ... | ... | ... | 141°C                             |
| Load carrying capacity,<br>Mean Hertz Load, min | ... | ... | ... | ... | 50 kg                             |

The specification includes tests for corrosion of copper, steel, additive elements, acid number, base number and storage stability.

- Uses:** Certain aircraft gearboxes and translation unit bearings in contra-rotating propellers operated over the temperature range of minus 30°C to plus 120°C.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0539	25 litre	--	++	34B
9150-99-477-3152	5 litre	--	++	34B

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## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### NATO O-136

#### OEP-71

LUBRICATING OIL, AIRCRAFT TURBINE ENGINE :  
Petroleum, extreme pressure

**Specification:** Def Stan 91-97/1, includes OM-71.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Pure refined mineral oil containing an extreme pressure additive.  
May also contain technically acceptable point depressants.

**Characteristics:** Viscosity at 100°C ... .. 8.7-9.3 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 100  
Pour point, max ... .. -29°C  
Flash point, open cup, min... .. 210°C

The specification includes tests for copper corrosion,  
saponification value, ash acidity, and additive content.

**Uses:** Gearboxes on certain aircraft and aircraft cannon.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-910-0540	25 litre	--	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,  
Refer to appropriate service authority, page 5.**

## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### OEP-80

LUBRICATING OIL, STEAM TURBINE AND GEAR: Extreme pressure

**Specification:** Def Stan 91-74/2.

**Composition:** Mineral oil with extreme pressure additives and pour point depressant.

**Characteristics:** Viscosity at 100°C min ... .. 8.0 mm<sup>2</sup>/s(cSt)  
Viscosity at 40° ... .. 61.2-74.8 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -6°C  
Flash point, closed cup, min ... 165°C

**Uses:** In HM Ships propulsion units which have high gear tooth loading, associated main and auxiliary steam turbines, certain gas turbines, hydraulic equipment, air compressors and general lubrication equipment.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-793-6720	25 litre	0475	--	34D
9150-99-793-6719	200 litre	0475	--	--
9150-99-793-6718	Bulk	0725	--	--

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## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### OEP-215

LUBRICATING OIL, GEAR: Helicopter

**Specification:** DTD 900/4981A, (AFS-1274) Shell Aviation Oil S.8350.

**Composition:** Mineral oil with extreme pressure additives and pour point depressants.

**Characteristics:** Viscosity at 100°C ... .. 16.3-17.4 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 85  
Pour point, max ... .. -18°C  
Flash point, open cup, min ... 177°C

The specification includes tests for corrosion of copper and steel, a channelling test at minus 18°C, thermal stability and foaming characteristics.

**Uses:** Lubricant for gearboxes in certain helicopters.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-224-7928	25 litre	--	++	34B

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**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### NATO O-226

### OEP-220

LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 80W-90

**Specification:** Def Stan 91-59/2, includes OEP-38.\*

**Composition:** Mineral oil with extreme pressure additives it may also contain a technically acceptable pour point depressant.

**Characteristics:** Viscosity at 100°C ... .. 13.5-24 mm<sup>2</sup>/s(cSt)  
Viscosity at -26°C, max ... .. 150 000 mPa.s(cP)  
Flash point, closed cup, min ... .. 165°C

The specification includes tests for corrosion of copper and steel, foaming characteristics, thermal stability and certain gearbox tests.

**Uses:** Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, steering gears and fluid lubricated universal joints of automotive equipment, operating over the temperature range of minus 15°C to 130°C.

**Note:** This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. If the bulk temperature of the oil exceeds 130°C, there is a risk that some decomposition of EP additives may occur.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1477	5 litre	0475	++	--
9150-99-910-0542	25 litre	0475	++	34D
9150-99-224-7728	200 litre	0475	++	34D
9150-99-740-4516	Bulk	--	++	--

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\*Note: This product implements STANAG 7091.



## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### OEP-230

LUBRICATING OIL, GEAR: Extreme pressure,  
Grade SAE 75W-80 (75W-80W), GL-5

**Specification:** SAE 75W-80, API GL-5

**Composition:** Mineral and/or synthetic hydrocarbon oils with additives.

**Characteristics:** Viscosity at 100°C, min ... .. 7.0 mm<sup>2</sup>/s(cSt)  
Viscosity at -40°C max ... .. 150 000 mPa.s(cP)  
Pour Point, typical ... .. -45°C  
Flash Point, closed cup, typical ... 155°C

The specification also includes tests for the corrosion of copper and foaming characteristics.

**Uses:** Lubrication of certain automotive gear units, medium duty industrial type enclosed gear units, fluid lubricated universal joints and hubs of automotive equipment, operated over the temperature range of minus 40°C to 100°C.

Note: This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. If the bulk temperature of the oil exceeds 140°C, there is a risk that some decomposition of EP additives may occur.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-960-3312	5 litre	--	++	--

## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### OEP-240

LUBRICATING OIL, GEAR: Extreme pressure, limited slip  
Grade SAE 80W-90, GL-5 LS

**Specification:** SAE80W-90, API GL-5 LS.

**Composition:** Mineral and/or synthetic hydrocarbon oils containing friction modifiers and other additives.

**Characteristics:** SAE viscosity classification ... .. 80W-90  
Other SAE classifications covered ... 85W-90, 90  
Viscosity at 100°C ... .. 13.5–24.0 mm<sup>2</sup>/s(cSt)  
Viscosity at –26°C, max ... .. 150 000 mPa.s(cP)  
Pour Point, typical ... .. -30°C  
Flash point, closed cup, typical ... 165°C

The specification also includes tests for corrosion of copper and foaming characteristics.

**Uses:** Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, steering gears and fluid lubricated universal joints of automotive equipment where limited slip properties are required, operated over the temperature range of minus 15°C to 140°C.

**Note:** This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. If the bulk temperature of the oil exceeds 140°C, there is a risk that some decomposition of EP additives may occur.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-788-6207	25 litre	--	++	34D

## SECTION 1B : OEP - EXTREME PRESSURE OILS

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### OEP-250

LUBRICATING OIL, GEAR: Extreme pressure,  
Grade SAE 80W-140, GL-5

**Specification:** SAE 80W-140, API GL-5

**Composition:** Mineral and/or synthetic hydrocarbon oils with additives.

**Characteristics:** Viscosity at 100°C ... .. 24.0–41.0 mm<sup>2</sup>/s(cSt)  
Viscosity at -26°C max ... .. 150 000 mPa.s(cP)  
Pour Point, typical ... .. -26°C  
Flash Point, closed cup, typical ... 180°C

The specification also includes tests for the corrosion of copper and foaming characteristics.

**Uses:** Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, and fluid lubricated universal joints of automotive equipment operated over the temperature range of minus -25°C to 140°C.

Note: This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. If the bulk temperature of the oil exceeds 140°C, there is a risk that some decomposition of EP additives may occur.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-906-5726	5 litre	--	++	34D
9150-99-615-2815	25 litre	--	++	34D

**SECTION 1B : OEP - EXTREME PRESSURE OILS**

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**SECTION 1C : OM  
MINERAL OILS**

## SECTION 1C : OM - MINERAL OILS

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### NATO O-135

#### OM-11

LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum

**Specification:** Def Stan 91-99/1.

**Composition:** Light mineral oil containing 0.05 to 0.10 percent of stearic acid.

**Characteristics:** Viscosity at 40°C, min... .. 12 mm<sup>2</sup>/s(cSt)  
Viscosity at -25°C, max ... .. 1250 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -45°C  
Flash point, closed cup, min ... 144°C

The specification includes tests for copper corrosion, ash, acidity, saponifiable matter, oxidation stability and aromatic content.

**Uses:** In certain early marks of aircraft turbo-jet engines, eg Avon Mk 1, and also Rover gas turbines. Inhibiting oil in stored aircraft systems.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-910-5055	25 litre	0475	++	34B

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**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,  
Refer to appropriate service authority, page 5.**

## SECTION 1C : OM - MINERAL OILS

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### NATO O-142

#### OM-12

LUBRICATING OIL, GENERAL PURPOSE: Low temperature

**Specification:** Def Stan 91-47/1.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Light mineral oil containing corrosion and oxidation inhibitors.

**Characteristics:** Viscosity at 40°C, min ... .. 9 mm<sup>2</sup>/s(cSt)  
Viscosity at -40°C, max ... .. 4000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -57°C  
Flash point, closed cup, min ... .. 118°C

The specification includes tests for acidity, precipitation number, copper corrosion, oxidation stability, corrosion protection of steels and various other metals and alloys, low temperature stability and evaporation loss.

**Uses:** Lubrication of certain lightly loaded aircraft mechanisms and instruments operated over the temperature range of minus 55°C to plus 70°C.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-943-8712	1 litre	0475	--	34B

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## SECTION 1C : OM - MINERAL OILS

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### NATO O-134

#### OM-13

LUBRICATING OIL, GENERAL PURPOSE: Petroleum, light

**Specification:** Def Stan 91-44/1.

**Composition:** Light mineral oil containing 0.05 to 0.10 percent of stearic acid.

**Characteristics:** Viscosity at 40°C, min ... .. 12 mm<sup>2</sup>/s(cSt)  
Viscosity at -25°C, max ... .. 1250 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -45°C  
Flash point, closed cup, min ... .. 144°C

The specification includes tests for acidity, ash, saponification value, copper corrosion, trace element content, and aromatic content.

**Uses:** General purpose hydraulic fluid, buffer oil under temperate conditions in vehicles and land based equipment, and also for the lubrication of lightly loaded mechanisms. Inhibiting oil in stored aircraft systems.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1239	400ml Aerosol	0475	--	--
9150-99-220-2558	1 litre	0475	++	34D
9150-99-943-1324	25 litre	0475	++	34D
9150-99-553-9083	200 litre	--	++	--

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## SECTION 1C : OM - MINERAL OILS

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### NATO H-515

#### OM-15

HYDRAULIC FLUID, PETROLEUM: Superclean

- Specification:** Def Stan 91-48/2, includes OM-18.\*  
This product requires Product Conformity Certification.  
See page 5, Service Authority.
- Composition:** Light mineral oil blended with an oxidation inhibitor including not more than 20 percent of viscosity index improver and 0.5 percent of a technically acceptable non toxic triaryl phosphate as an antiwear agent.
- Characteristics:**
- |                              |        |                              |
|------------------------------|--------|------------------------------|
| Colour, Lovibond Red         | ... .. | 20-40                        |
| Viscosity at 100°C, min      | ... .. | 4.0 mm <sup>2</sup> /s(cSt)  |
| Viscosity at 40°C, min       | ... .. | 13 mm <sup>2</sup> /s(cSt)   |
| Viscosity at -40°C, max      | ... .. | 500 mm <sup>2</sup> /s(cSt)  |
| Viscosity at -54°C, max      | ... .. | 3000 mm <sup>2</sup> /s(cSt) |
| Pour point, max              | ... .. | -60°C                        |
| Flash point, closed cup, min | ... .. | 81°C                         |

The specification includes tests for particulate contamination, acidity, oxidation stability, low temperature stability, evaporation loss, shear stability, foaming characteristics, phosphorus content, corrosion of metals and the effect on rubber.

- Uses:** Hydraulic mechanisms in aircraft and other specified equipment operated over the temperature range of minus 54°C to plus 90°C in unpressurized systems and minus 54°C to plus 135°C in pressurized systems.

Where a 'superclean' fluid is not mandatory OM-18, NATO H-520 should be used.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-4971	1 litre	--	--	34B
9150-99-910-0572	5 litre	0475	++	34B

---

\* Note: This product implements STANAG 3748.

## SECTION 1C : OM - MINERAL OILS

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### NATO S-756

#### OM-16

INSULATING OIL: Electrical

**Specification:** BS 148: 1998.\* Class 1.

**Composition:** Highly refined mineral oil, specially prepared for use as insulating oil.

**Characteristics:** Viscosity at -15°C ... .. 800 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -30°C  
Flash point, closed cup, min ... .. 140°C

The specification includes tests for density, sludge formation tendency, acidity after oxidation, electric strength, corrosive sulfur and water content.

**Uses:** Transformers, switchgear and for other electrical purposes.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9160-99-942-7822	5 litre	0475	++	34D
9160-99-942-7823	25 litre	0475	++	34D
9160-99-942-7825	200 litre	0475	--	--

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\*Note: This product implements STANAG 7094.

## SECTION 1C : OM - MINERAL OILS

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### OM-17

LUBRICATING OIL: White

**Specification:** UK Mineral Hydrocarbons in Food regulations 1966 (SI 1966/1703).

**Composition:** Water white, tasteless and odourless mineral oil which may contain not more than 10 parts per million of a technically acceptable stabilizer. Suppliers shall state the nature and concentration of stabilizer used.

**Characteristics:** Viscosity of 40°C ... .. 12-15 mm<sup>2</sup>/s (cSt)  
Flash point, closed cup, min ... .. 150°C

**Uses:** For the lubrication of certain machinery, and in many other applications where non-additive, highly refined, white mineral oils are required.

**Standardized Alternatives:** None

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-910-0545	25 litre	0475	++	34D

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## SECTION 1C : OM - MINERAL OILS

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### NATO H-520

#### OM-18

HYDRAULIC FLUID, PETROLEUM: Normal

**Specification:** Def Stan 91-48/2, includes OM-15.\*

**Composition:** Light mineral oil blended with an oxidation inhibitor including not more than 20 percent of viscosity index improver and 0.5 percent of a technically acceptable non-toxic triaryl phosphate as an antiwear agent.

**Characteristics:** Identical with OM-15 except that the particulate contamination content is not specified.

**Uses:** Hydraulic mechanisms in specified equipment operated over the temperature range of minus 54°C to plus 90°C in unpressurized systems and minus 54°C to plus 135°C in pressurized systems. In machine guns of up to 20 mm bore, where specified.

**WARNING:** This fluid is not for use in systems requiring a 'superclean' fluid. For such requirements, OM-15, NATO H-515 shall be used.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-225-1567	25 litre	--	++	34D

---

\*Note: This product implements STANAG 3748.

## SECTION 1C : OM - MINERAL OILS

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### OM-22

INSULATING OIL, ELECTRICAL: Low pour point

**Specification:** BS 148: 1998, Class II.

**Composition:** Highly refined mineral oil, specially prepared for use as an insulating oil.

**Characteristics:** Viscosity at 40°C max ... .. 11.0 mm<sup>2</sup>/s (cSt)  
Viscosity at -30°C max ... .. 1800 mm<sup>2</sup>/s (cSt)  
Pour Point max ... .. -45°C  
Flash point, closed cup, min... .. 130°C

**Uses:** In transformers and switchgear, and for other electrical purposes where especially low temperatures may be encountered.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9160-99-956-3461	25 litre	--	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,**  
Refer to appropriate service authority, page 5.

## SECTION 1C : OM - MINERAL OILS

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### OM-24

#### FLUSHING OIL

**Specification:** BS4475: 2000 Grade CS-22

**Composition:** Mineral oil with pour point depressant.

**Characteristics:** Viscosity at 40°C ... .. 19.8–24.2 mm<sup>2</sup>/s(cSt)  
Viscosity index ... .. 90 min  
Pour point, max ... .. –9°C  
Flash point, closed cup, min ... 165°C

The specification includes a test for acidity.

**Uses:** For flushing oil systems of Naval equipment where the working lubricant is OM-33, OM-65, OM-100, OMD-113 or OEP-80.

Also for flushing oil systems of land service engines, piston aero engines and gearboxes.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-0360	25 litre	0475	++	34D
9150-99-224-1653	200 litre	0475	++	34D

---

## SECTION 1C : OM - MINERAL OILS

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### NATO H-576

#### OM-33

HYDRAULIC FLUID, PETROLEUM: Antiwear

**Specification:** Def Stan 91-39/3.

**Composition:** Mineral oil with additives.

The use of additives containing metals is prohibited.

**Characteristics:** Viscosity at 0°C, max ... .. 500 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C ... .. 28.8-35.2 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -30°C  
Flash point, closed cup, min ... 160°C

The specification includes tests for acidity, water content, copper corrosion, load carrying ability, antiwear properties, compatibility, demulsification, air release, rust preventing characteristics, oxidation stability, foaming characteristics, filterability characteristics and a swelling test on a standard rubber.

**Uses:** Hydraulic fluid in machine tools, forklift trucks and handling gear systems of HM ships and certain fighting vehicles. Lubrication of certain gunnery equipment, radar equipment where the ambient temperature is not lower than minus 30°C.

**WARNING:** Some nations' products may contain zinc. These shall not be used in place of OM-33.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-942-3224	5 litre	0475	++	34D
9150-99-943-1325	25 litre	0475	++	34D
9150-99-944-0596	200 litre	0475	++	34D
9150-99-641-8036	Bulk	0475	++	34D

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## SECTION 1C : OM - MINERAL OILS

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### OM-58

LUBRICATING OIL, PETROLEUM: Compressor, light

**Specification:** Def Stan 91-42/2, includes OM-160.

**Composition:** Mineral oil which may contain a technically acceptable pour point depressant.

**Characteristics:**

Viscosity at 40°C	...	...	...	61.2-74.8 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	75
Pour point, max	...	...	...	-18°C
Flash point, closed cup, min	...	...	...	177°C

The specification includes tests for acidity, ash, saponification value, copper corrosion, oxidation stability and asphaltenes.

**Uses:** Certain air compressors, Naval breech blocks and miscellaneous lubricant for equipment where the ambient temperature is not lower than minus 18°C.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-910-6165	25 litre	0475	++	34D

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## SECTION 1C : OM - MINERAL OILS

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### NATO H-572

#### OM-65

HYDRAULIC FLUID, PETROLEUM: Uninhibited

**Specification:** BS 4475: 2000, Grade CS-68, specification includes other grades.

**Composition:** Plain mineral oil.

**Characteristics:** Viscosity at 40°C ... .. 61.2-74.8 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 90  
Pour point, max ... .. -9°C  
Flash point, closed cup, min ... 192°C

The specification includes tests for acidity.

**Uses:** Certain Naval gunnery systems and submarine telemotor equipment under temperate conditions.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1942	250 ml	0475	--	--
9150-99-220-3468	5 litre	0475	--	--
9150-99-224-2541	25 litre	0475	--	--
9150-99-910-0576	200 litre	0475	--	--
9150-99-797-3609	500 ml	0475	--	--

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## SECTION 1C : OM - MINERAL OILS

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### NATO O-285

#### OM-70

LUBRICATING OIL, REFRIGERANT COMPRESSOR: Uninhibited

**Specification:** BS 2626:1992, Type A, Grade 68.

**Composition:** Plain mineral oil.

**Characteristics:** Viscosity at 40°C ... .. 61.2–74.8 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. –24°C  
Flash point, closed cup, min ... 171°C

The specification includes tests for moisture, acidity, copper corrosion, and material insoluble refrigerant.

**NOTE:** In addition to meeting specification requirements a proportion of filled containers are subjected to an immersion test.

**Uses:** Refrigerators.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-942-4988	500 ml	0475	++	--
9150-99-942-4990	1 litre	0475	++	34D
9150-99-942-4989	5 litre	0475	++	34D

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**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,  
Refer to appropriate service authority, page 5.**

## SECTION 1C : OM - MINERAL OILS

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### NATO O-138

#### OM-71

LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum

**Specification:** Def Stan 91-97/1, includes OEP-71.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Pure refined mineral oil which may contain a technically acceptable pour point depressant.

**Characteristics:** Viscosity at 100°C ... .. 8.7-9.3 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 100  
Pour point, max ... .. -29°C  
Flash point, open cup, min ... 210°C

The specification includes tests for copper corrosion, ash, acidity and saponification value.

**Uses:** Miscellaneous aircraft applications.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0577	500 ml	--	--	34B
9150-99-943-3224	25 litre	0475	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,**  
Refer to appropriate service authority, page 5.

## SECTION 1C : OM - MINERAL OILS

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### NATO O-240

### OM-100

LUBRICATING OIL, STEAM TURBINE AND GEAR: Light service

**Specification:** Def Stan 91-25/3.\*

**Composition:** Mineral oil with additives.

**Characteristics:**

Viscosity at 40°C	...	...	...	72-81 mm <sup>2</sup> /s(cSt)
Viscosity at 100°C, min	...	...	...	8.0 mm <sup>2</sup> /s(cSt)
Pour point, max	...	...	...	-6°C
Flash point, closed cup, min	...	...	...	165°C

The specification includes tests for acidity, copper corrosion, oxidation stability, foaming characteristics, water separation properties, demulsification properties, rust preventing characteristics and rust inhibiting properties.

**Uses:** Lubricant in main and auxiliary steam turbines and their associated gearing and for auxiliary reciprocating engines with forced lubrication systems. Ball and roller bearings in certain electric motors, torpedo tube mechanisms, preservation of Naval aircraft guns and belt feed mechanisms. Also for certain hydraulic systems in HM ships and general purposes.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-944-0425	25 litre	0475	--	--
9150-99-910-0578	200 litre	0475	--	34D
9150-99-224-2538	Bulk	0725	--	--

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\* Note: This product implements STANAG 1425

## SECTION 1C : OM - MINERAL OILS

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### OM-150

LUBRICATING OIL, AIRCRAFT CONTROLS: Antifreezing

**Specification:** DTD 417B.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oil containing a technically acceptable thickening agent.

**Characteristics:** Viscosity at 20°C ... .. 350–2000 mm<sup>2</sup>/s(cSt)  
Viscosity at 60°C, min ... .. 50 mm<sup>2</sup>/s(cSt)  
Flash point, closed cup, min ... 149°C

The specification includes tests for acidity, copper corrosion and lubricating properties at minus 55°C.

**Uses:** Low temperature lubrication of hinges and open bearings in flying control systems down to minus 55°C where grease cannot be applied, and for W/T aerial gear.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-910-0550	25 litre	--	--	34B

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## SECTION 1C : OM - MINERAL OILS

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### OM-160

LUBRICATING OIL, PETROLEUM: Compressor, medium

**Specification:** Def Stan 91-42/2, includes OM-58.

**Composition:** Mineral oil which may contain technically acceptable pour point depressant.

**Characteristics:**

Viscosity at 40°C	...	...	...	135-165 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	75
Pour point, max...	...	...	...	-12°C
Flash point, closed cup, min	...	...	...	186°C

The specification includes tests for acidity, ash, saponification value, copper corrosion, oxidation stability and asphaltenes.

**Uses:** General purpose lubricant for machinery and running in Service spark and compression ignition engines.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-910-0551	25 litre	0475	++	34D
9150-99-282-3291	200 litre	--	++	34D

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## SECTION 1C : OM - MINERAL OILS

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### OM-170

LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Grade SAE 40

**Specification:** SAE J1966, Grade 40, Rev '00, includes OM-270.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Mineral oil which may contain approved pour point depressants, anti-foam agents and antioxidants.

**Characteristics:**

Viscosity at 100°C	...	...	...	12.5–16.5 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	85
Pour point, max	...	...	...	-15°C
Flash point, open, min	...	...	...	225°C

The specification includes engine tests, and tests for copper corrosion, sedimentation, foaming characteristics, ash and acidity.

**Uses:** For certain aircraft piston engines, magneto and generator bearings of certain aircraft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-910-0553	1 litre	--	--	34B

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## SECTION 1C : OM - MINERAL OILS

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### OM-270

LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Grade SAE 50

**Specification:** SAE J1966, Grade 50, Rev '00, includes OM-170.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Mineral oil which may contain technically acceptable pour point depressants, anti-foam agents and antioxidants.

**Characteristics:**

Viscosity at 100°C	...	...	...	16.3–21.9 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	85
Pour point, max	...	...	...	–12°C
Flash point, open cup, min	...	...	...	243°C

The specification includes engine tests, and tests for copper corrosion, sedimentation, foaming characteristics, ash and acidity.

**Uses:** For certain aircraft piston engines.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0554	200 litre	--	--	34B
9150-99-433-5063	1 litre	--	--	34B

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## SECTION 1C : OM - MINERAL OILS

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### NATO O-252

#### OM-750

LUBRICATING OIL, STEAM CYLINDER: Saturated

**Specification:** BS 4475: 2000, Grade CS-680, specification includes other grades.

**Composition:** Mineral oil which may contain pour point depressants.

**Characteristics:** Viscosity at 40°C ... .. 612-748 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 80  
Pour point, max ... .. -3°C  
Flash point, closed cup, min ... 249°C

The specification includes tests for acidity and oxidation characteristics.

**Uses:** Lubricant for saturated steam cylinders and the firing gear of torpedo tubes.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-943-3220	25 litre	0475	++	34D
9150-99-910-0556	200 litre	0475	++	--

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## SECTION 1C : OM - MINERAL OILS

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### NATO O-258

### OM-1300

LUBRICATING OIL, STEAM CYLINDER: Superheated

**Specification:** BS 4475: 2000, Grade CS-1000, specification includes other grades.

**Composition:** Mineral oil which may contain pour point depressants.

**Characteristics:** Viscosity at 40°C ... .. 900-1100 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 70  
Pour point, max ... .. 6°C  
Flash point, closed cup, min ... 261°C

The specification includes tests for acidity.

**Uses:** Lubricant for superheated steam cylinders and as a heat transfer medium.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-943-1329	25 litre	0475	--	34D

**SECTION 1D: OMD  
HEAVY DUTY ENGINE OILS**

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-23

LUBRICATING OIL, ENGINE: Two-stroke

**Specification:** Def Stan 91-104/1

**Composition:** Mineral oil and/or synthetic oils with a technically acceptable hydrocarbon diluent to facilitate mixing with fuel.

**Characteristics:** This oil corresponds to the American Boating Industries Association Certification for Service. Two-Cycle Water Cooled Engines (TC-W3)

Viscosity at 100°C, min ... .. 5mm<sup>2</sup>/s(cSt)

Flash point, closed cup, min ... .. 61°C

The specification includes a test for filter blocking tendency.

**Uses:** In two stroke engines which require fuel/oil mixture. The fuel/oil ratio to be used in an engine is that recommended in the relevant Service instruction or by the engine manufacturer.

**Standardized Alternatives:** None

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-547-5556	1 litre	0475	++	34D
9150-99-374-6895	5 litre	0475	++	34D

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NOTE: This replaces OMD-45.

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### NATO O-1178

#### OMD-55

LUBRICATING OIL, ENGINE:  
Severe duty, diesel, low temperature

**Specification:** Def Stan 91-68/1.

**Composition:** Synthetic and/or mineral hydrocarbons with additives.

**Characteristics:** SAE viscosity classification... .. 5W-30  
API performance, minimum ... .. CF-4/SG or ACEA  
equivalent  
Viscosity at 100°C ... .. 9.3-12.5 mm<sup>2</sup>/s(cSt)  
LT Pumping viscosity at -35°C, max ... 60000 mPa.s(cP)  
LT Cranking viscosity at -30°C, max ... 6600 mPa.s(cP)  
Pour point, max ... .. -36°C  
Flash point, closed cup, min ... .. 180°C

**Uses:** The primary use of this heavy duty crankcase oil is to replace OMD-90 in compression ignition and spark ignition engines when operated persistently below minus 20°C.

**Note:** When reverting to normal temperature conditions OMD-55 need not be replaced until next oil change is due.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-477-3153	25 litre	--	++	34D

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**NOTE:** This implements STANAG 7091

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### NATO O-1176

#### OMD-90

##### LUBRICATING OIL, ENGINE:

Severe duty, diesel, extended service SAE 10W-30

**Specification:** Def Stan 91-113/1.

**Composition:** Mineral oil and/or synthetic hydrocarbons with additives.

**Characteristics:**

SAE viscosity classification	... ..	10W-30
API performance, minimum	... ..	CF-4/SG or ACEA equivalent
Viscosity at 100°C	... ..	9.3–12.5 mm <sup>2</sup> /s(cSt)
Viscosity apparent at -30°C, min	... ..	3500 mPa.s(cP)
Viscosity apparent at -20°C, max	... ..	3500 mPa.s(cP)
Pour point, max	... ..	-30°C
Flash point, closed cup, min	... ..	190°C

The specification includes engine tests and tests for corrosion inhibition, volatility, low temperature pumpability, foaming characteristics, shear stability, elastomer compatibility and reserve alkalinity.

**Uses:** Multigrade heavy duty crankcase oil for use in compression ignition and spark ignition engines of ground equipment operated at all ambient temperatures above minus 20°C. Also in some gearboxes, automatic gearboxes, torque converters, hydraulic systems and power steering systems.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-991-1124	25 litre	0475	++	34D
9150-99-244-8028	200 litre	0475	++	34D
9150-99-670-3317	Bulk	0475	++	34D

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\* Note: This product implements STANAG 7091.

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### NATO O-278

### OMD-113

LUBRICATING OIL, NAVAL DIESEL: Severe service

**Specification:** Def Stan 91-22/4.

**Composition:** Mineral oil with additives.

**Characteristics:**

SAE viscosity classification	...	40
ACEA performance, min	...	E2
API performance, min	...	CF
Viscosity at 100°C	...	12.5–16.3 mm <sup>2</sup> /s(cSt)
Viscosity at 0°C, max	...	3300 mm <sup>2</sup> /s(cSt)
Pour point, max	...	-15°C
Flash point, closed cup, min	...	180°C
Total base number, typical	...	10 mg KOH/g

The specification includes engine tests and tests for sulfated ash, load carrying ability, rust prevention, foaming characteristics and additive content.

**Uses:** Lubrication of main and auxiliary IC engines in Naval ships and craft operating in all climates. Also in other machinery in HM ships where authorized.

Used in engines of certain railway locomotives, stationary generating plant, certain RAF marine craft and the sleeve spindle oil tank of RN Sea King helicopters.

**WARNING:** Not to be used in gasoline engines.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-224-2540	25 litre	0475	--	34D
9150-99-220-3088	200 litre	0475	++	34D
9150-99-224-7025	Bulk	0725	--	--

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-140

#### LUBRICATING OIL, ENGINE :

Diesel two-stroke, heavy duty, monograde, Grade SAE 40

**Specification:** Detroit Diesel Corporation Publication 7SE 270 May 1997

**Composition:** Highly Refined Petroleum Mineral Base Oil and Additives

**Characteristics:** SAE Viscosity Classification ... .. SAE 40  
API Performance, minimum ... .. CF-2  
Viscosity at 100°C ... .. 12.5–16.3 mm<sup>2</sup>/s(cSt)  
Sulfated Ash % w/w, max ... .. 1.0

**Uses:** In both naturally aspirated and turbo-charged Detroit Diesel two-stroke engines. Could be used in other related applications but not for outboard motors or chainsaws.

**Standardized Alternatives:** None

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-869-7211	5 litre	--	++	34D
9150-99-869-7212	25 litre	--	++	34D

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## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-160

LUBRICATING OIL, AIRCRAFT PISTON ENGINE:  
Dispersant base mineral oil, Grade SAE 40

**Specification:** SAE J1899, Grade 40, Rev '00, includes OMD-162, OMD-250 and OMD-370.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Mineral oil which shall contain approved ashless dispersant additives and may contain approved pour point depressants, VI improvers, anti-foam agents and antioxidants.

**Characteristics:** Viscosity at 100°C ... .. 12.5–16.3 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -15°C  
Flash point, open cup, min 225°C  
Ash, percent, max ... .. 0.011

The specification includes engine tests and tests for acidity, copper corrosion, carbon residue, total sulfur, sedimentation and foaming characteristics.

**Uses:** Certain aircraft piston engines and in the sleeve spindle oil tank of RAF Sea King helicopters.

**Standardized Alternatives:** None.

**Note:** The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220  
**WARNING.**

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-8087	25 litre	--	++	34B
9150-99-220-1093	200 litre	--	++	34B

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## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-162

LUBRICATING OIL, AIRCRAFT PISTON ENGINE  
Dispersant base mixed synthetic hydrocarbon and mineral oil  
Grade SAE 15W-50

**Specification:** SAE J1899, Multi-grade, Rev '00, includes OMD-160, OMD-250 and OMD-370.

This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Mixed synthetic hydrocarbon and mineral oil which shall contain an approved antiwear additive (see Note 1 below), together with approved ashless dispersant additives. The lubricant may also contain approved pour point depressants, VI improvers, anti-foam agents and antioxidants.

**Characteristics:**

Viscosity at -15°C max	... ..	3500 mPa.s(cP)
Viscosity at 100°C	... ..	16.3-21.9 mm <sup>2</sup> /s(cSt)
Viscosity Index, min	... ..	100
Flash point, open cup, min	... ..	220°C

The specification includes engine tests and tests for acidity, copper corrosion, total sulfur, sedimentation and foaming characteristics.

**Uses:** Certain aircraft piston engines

Note 1: Lubricants procured to OMD-162 listed on the TAPL for UK MOD use, already contain the antiwear additive which meets the requirements of Avco Lycoming (Allied Signal) IO-360 engines. No further addition of the Textron Lycoming oil additive Part No. LV-16702 should be made.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-360-4081	1 litre	--	--	34B

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-250

LUBRICATING OIL, AIRCRAFT PISTON ENGINE:  
Dispersant base mineral oil, Grade SAE 50

**Specification:** SAE J1899, Grade 50, Rev '00, includes OMD-160, OMD-162 and OMD-370.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Mineral oil which shall contain approved ashless dispersant additives and may contain approved pour point depressants, VI improvers, anti-foam agents and antioxidants.

**Characteristics:**

Viscosity at 100°C	... ..	16.3–21.9 mm <sup>2</sup> /s(cSt)
Pour point, max	... ..	–18°C
Flash point, open cup, min...		243°C
Ash, percent, max	... ..	0.011

The specification includes engine tests and tests for acidity, copper corrosion, total sulfur, sedimentation and foaming characteristics.

**Uses:** Certain aircraft piston engines.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1095	200 litre	--	--	34B

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## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-330

LUBRICATING OIL, ENGINE: Grade SAE 50

**Specification:** Def Stan 91-43/2.\*

**Composition:** Mineral oil and/or synthetic hydrocarbons with additives.

**Characteristics:** SAE viscosity classification ... 50  
Viscosity at 100°C ... .. 16.3-21.9 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 75  
Pour point, max ... .. -9°C  
Flash point, closed cup, min ... 195°C

The specification includes engine tests and tests for acidity, carbon residue, sulfated ash, load carrying capacity, foaming characteristics, elastomer compatibility and additive content.

**Uses:** Certain compressors and gearboxes

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0585	25 litre	0475	++	34D
9150-99-224-0643	200 litre	--	++	34D
9150-99-392-9027	Bulk	--	++	--

**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,  
Refer to appropriate service authority, page 5.**

## SECTION 1D : OMD - HEAVY DUTY ENGINE OILS

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### OMD-370

LUBRICATING OIL, AIRCRAFT PISTON ENGINE:  
Dispersant base mineral oil, Grade SAE 60

**Specification:** SAE J1899, Grade 60, Rev '00, includes OMD-160, OMD-162 and OMD-250.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Mineral oil which shall contain approved ashless dispersant additives and may contain approved pour point depressants, VI improvers, anti-foam agents and anti oxidants.

**Characteristics:** Viscosity at 100°C ... .. 21.9-26.1 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -18°C  
Flash point, open cup, min ... 243°C  
Ash, percent, max ... .. 0.011

The specification includes engine tests and tests for acidity, copper corrosion, total sulfur, sedimentation and foaming characteristics.

**Uses:** Certain aircraft piston engines.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-0875	25 litre	--	--	34B
9150-99-220-1097	200 litre	--	--	34B

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**SECTION 1D : OMD - HEAVY DUTY ENGINE OILS**

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**SECTION 1E: OX  
FLUIDS**

## SECTION 1E : OX - FLUIDS

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### OX-7

LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE:  
Synthetic 3 cSt

**Specification:** Def Stan 91-94/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic oil with additives.

**Characteristics:** Viscosity at 200°C, min ... .. 1.0 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C, max ... .. 4.0 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C, max ... .. 16.0 mm<sup>2</sup>/s(cSt)  
Viscosity at -54°C, max ... .. 13000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -60°C  
Flash point, open cup, min ... 225°C

The specification includes tests for performance in aircraft engines, load carrying ability, acidity, foaming characteristics, high temperature oxidative stability, sediment, trace element content, confined heat stability, corrosivity, elastomer compatibility, miscibility and compatibility with other oils to the same and other specifications, hydrolytic stability, coking propensity, catalytic oxidation and low-temperature viscosity stability.

**Uses:** Certain aircraft turbine engines and auxiliary equipment.

**WARNING:** This oil is unsuitable for use with natural, silicone and polychloroprene, eg Neoprene, elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1938	5 litre	--	++	34B
9150-99-224-0745	200 litre	--	--	34B

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## SECTION 1E : OX - FLUIDS

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### NATO H-542

#### OX-8

#### BRAKE FLUID, AUTOMOTIVE

**Specification:** SAE J1704, Rev '00

**Composition:** Borate ester based brake fluid.

**Characteristics:**

Viscosity at 100°C, min	...	...	...	1.5 mm <sup>2</sup> /s(cSt)
Viscosity at -40°C, max	...	...	...	1800 mm <sup>2</sup> /s(cSt)
Flash point, closed cup, min	...	...	...	80°C
Equilibrium reflux boiling point, min...	...	...	...	230°C
Equilibrium reflux boiling point, with 3 percent added water, min	...	...	...	155°C

The specification includes tests for high and low temperature stability, pH value, effects on rubbers, corrosive properties in contact with various metals and alloys and simulated service performance tests.

**Uses:** Certain hydraulic clutches, most automotive braking systems fitted with cups and seals made from natural rubber and styrene-butadiene rubber, operated over the ambient temperature range of minus 40°C to plus 55°C. Also meets the requirements of DOT 4.

**WARNING:** This product is not compatible with mineral or silicone based products.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-8089	500 ml	--	++	34D
9150-99-220-2348	1 litre	0475	++	34D

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## SECTION 1E : OX - FLUIDS

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### NATO O-148

#### OX-9

LUBRICATING OIL, AIRCRAFT TURBINE ENGINE:  
Synthetic 3 cSt

**Specification:** MIL-PRF-7808L Grade 3.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Synthetic based oil with additives.

**Characteristics:** Viscosity at 100°C, min ... .. 3.0 mm<sup>2</sup>/s(cSt)  
Viscosity at -51°C, max ... .. 17000 mm<sup>2</sup>/s(cSt)  
Flash point, open cup, min ... .. 210°C

The specification includes engine, gear and bearing tests and tests for trace metals, particulate contamination, acidity, viscosity change, evaporation loss, foaming characteristics, deposition, corrosivity, corrosion and oxidation stability, elastomer compatibility, compatibility with oils to same and other specifications and storage stability.

**Uses:** Certain aircraft turbine engines and auxiliary equipment.

**WARNING:** This oil is unsuitable for use with natural, silicone or polychloroprene, eg Neoprene, elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220

**WARNING.**

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-782-2627	1 litre	--	++	34B
9150-99-113-4915	5 litre	--	--	34B

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## SECTION 1E : OX - FLUIDS

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### NATO O-147

#### OX-14

LUBRICATING OIL, INSTRUMENT: Synthetic

**Specification:** Def Stan 91-49/1.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic oil with corrosion and oxidation inhibitors.

**Characteristics:** Viscosity at 40°C, min ... .. 12 mm<sup>2</sup>/s(cSt)  
Viscosity at -54°C, max ... .. 12000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -57°C  
Flash point, closed cup, min ... .. 165°C

The specification includes tests for acidity, precipitation number, oxidation stability, corrosion protection of steel and various other metals and alloys, low temperature stability, evaporation loss and storage stability.

**Uses:** Lubricant for aircraft instruments, electronic equipment, certain aircraft controls, and mechanical fuzes.

**WARNING:** This oil is unsuitable for use with natural or polychloroprene, eg Neoprene, rubbers. It also affects certain paints and plastics.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

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NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-224-6128	1 litre	0475	++	34B

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## SECTION 1E : OX - FLUIDS

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### OX-16

DAMPING FLUID: Silicone base

**Specification:** DTD 900/4386A, (AFS 1475) Arlcone fluid.

**Composition:** Silicone based fluid.

**Characteristics:** Viscosity at 99°C, min ... .. 5 mm<sup>2</sup>/s(cSt)  
Viscosity at 38°C ... .. 10 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -59°C

**Uses:** Damping fluid in oleo legs of certain aircraft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-083-1010	5 litre	--	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

SECTION 1E : OX - FLUIDS



NATO O-190

OX-18

LUBRICATING OIL, GENERAL PURPOSE: Preservative, light

**Specification:** Def Stan 91-79/1.\*  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oils with additives.

**Characteristics:** Viscosity at 38°C, min ... .. 12 mm<sup>2</sup>/s(cSt)  
Viscosity at -40°C, max ... .. 6000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -57°C  
Flash point, open cup, min ... .. 135°C

The specification includes tests for precipitation number, copper corrosion, rust inhibiting properties, oxidation stability, film forming properties, removability of film, water displacing ability in the presence of water.

**Uses:** Lubrication, preservation of certain missile and ejector seat guides and undercarriages of certain aircraft.

**Standardized Alternatives:** See Table 1

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-0364	500 ml	0475	- -	34B
9150-99-220-1174	5 litre	0475	+ +	34B
9150-99-220-1138	25 litre	0475	+ +	34B

\* Note: This product implements STANAG 7094

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**  
Refer to appropriate service authority, Page 5.

## SECTION 1E : OX - FLUIDS

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### NATO H-537

#### OX-19

#### HYDRAULIC FLUID, SYNTHETIC, FIRE RESISTANT

**Specification:** MIL-PRF-83282D  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Synthetic hydrocarbons containing up to 33 percent mass of diesters, with additives.

**Characteristics:** Colour ... .. Red  
Viscosity at 205°C, min ... .. 1.0 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C, min ... .. 3.45 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C, min ... .. 14.0 mm<sup>2</sup>/s(cSt)  
Viscosity at -40°C, max ... .. 2200 mm<sup>2</sup>/s(cSt)  
Flash point, open cup, min ... .. 205°C  
Pour point, max ... .. -55°C

The specification includes tests for specific gravity, colour, acidity or alkalinity, firepoint, auto ignition temperature, bulk modulus, corrosion and oxidation stability, resistance to oxidation, swelling of synthetic rubber, solid particle contamination, foaming characteristics, water content, flammability, lubricity, compatibility, low and high temperature stability and storage stability.

**Uses:** For hydraulic systems in certain aircraft.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-030-9168	25 litre	--	--	34B
9150-00-149-7432	1 US Gal	--	--	34B
9150-00-281-6191	5 US Gal	--	--	34B

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## SECTION 1E : OX - FLUIDS

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### OX-20

HYDRAULIC FLUID, PHOSPHATE ESTER BASE

**Specification:** DTD 900/4881D, (AFS-1559B) Skydrol 500B-4

**Composition:** Phosphate ester fluid.

**Characteristics:** Colour ... .. Purple  
Viscosity at 100°C ... .. 3.8 mm<sup>2</sup>/s(cSt) approx.  
Viscosity at 40°C ... .. 11 mm<sup>2</sup>/s(cSt) approx.  
Pour point. ... .. -62°C approx.  
Flash point, open cup, min 160°C  
Water content, percent .... 0.5 approx

**Uses:** Hydraulic fluid in certain aircraft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-7916	1 US gallon	--	--	34B
9150-99-877-1089	5 US gallons	--	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

## SECTION 1E : OX - FLUIDS

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### OX-22

LUBRICATING OIL, MARINE GAS TURBINE ENGINE:  
Synthetic type

**Specification:** Def Stan 91-93/2

**Composition:** Synthetic oil with additives.

**Characteristics:** Viscosity at 200°C, min ... .. 1.25 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C ... .. 4.4–5.4 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C, max ... .. 30 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. –30°C  
Flash point, open cup, min ... .. 220°C

This specification includes tests for performance in ships gas turbine engines, extended duration elastomer compatibility and corrosion inhibition. There are also tests for load carrying ability, acidity, foaming characteristics, volatility, corrosiveness and oxidative stability, sediment, trace element content, confined heat stability, miscibility and compatibility with other oils to the same and other specifications, coking propensity and hydrolytic stability.

**Uses:** Certain marine gas turbine engines in HM ships.

Also fully interchangeable with OX-28 in marine gas turbine applications only.

Note: OX-22 shall not be used in lieu of OX-28 in aero engines, certain radar and other “above deck” equipment.

**WARNING:** This oil is unsuitable for use with natural, silicone and polychloroprene, eg Neoprene, elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-588-0924	5 litre	0475	--	--

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## SECTION 1E : OX - FLUIDS

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### NATO O-157

#### OX-24

#### LUBRICATING OIL, WEAPONS, SMALL ARMS AND LIGHT CALIBRE WEAPONS

**Specification:** Def Stan 91-102/2

**Composition:** Mineral oil and/or synthetic hydrocarbon oil polyalphaolefin (PAO) with corrosion and oxidation inhibitors.

**Characteristics:** Viscosity at 40°C, min ... .. 5.5 mm<sup>2</sup>/s(cSt)  
Viscosity at -54°C, max ... .. 4000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -60°C  
Flash point, closed cup, min ... .. 120°C

The specification includes tests for total acid number, copper corrosion, corrosion prevention, wear prevention, corrosiveness and oxidation stability and elastomer compatibility.

**Uses:** Lubrication and preservation of small arms and light calibre weapons up to 20mm. OX-24 is compatible with current weapon cleaning/lubrication kits and is to be applied in accordance with the appropriate weapon cleaning/lubricating instructions.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-414-6509	1 litre	0475	++	34D
9150-99-126-6420	25 litre	--	++	34D

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Note: This product replaces OX-18 for small arms applications.

SECTION 1E : OX - FLUIDS

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NATO O-160

OX-26

LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE:  
Synthetic 5 cSt

**Specification:** Def Stan 91-100/3.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic oil with additives.

**Characteristics:** Viscosity at 200°C, min ... .. 1.25 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C ... .. 4.9–5.4 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C, max ... .. 30 mm<sup>2</sup>/s(cSt)  
Viscosity at –40°C, max ... .. 13000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -54°C  
Flash point, open cup, min... .. 210°C

The specification includes tests for performance in aircraft engines, load carrying ability, acidity, foaming characteristics, high temperature oxidative stability, sediment, trace element content, confined heat stability, corrosivity, elastomer compatibility, miscibility and compatibility with other oils to the same and other specifications, hydrolytic stability, coking propensity, catalytic oxidation and low-temperature viscosity stability.

**Uses:** Certain aircraft turbine engines, helicopter gearboxes and auxiliary equipment.

**WARNING:** This oil is unsuitable for use with natural, silicone and polychloroprene, eg Neoprene, elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220

**WARNING.**

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-551-0171	1 litre	--	++	34B
9150-99-225-0985	5 litre	--	++	34B

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## SECTION 1E : OX - FLUIDS

### NATO O-156

### OX-27

LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE :  
Synthetic 5 cSt

**Specification:** Def Stan 91-101/3, includes OX-28  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic oil with additives.

**Characteristics:** Viscosity at 200°C, min ... .. 1.25 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C ... .. 4.9–5.4 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C, max ... .. 30 mm<sup>2</sup>/s(cSt)  
Viscosity at -40°C, max ... .. 13000 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -54°C  
Flash point, open cup, min... .. 246°C

This specification includes tests for performance in ship gas turbine engines and elastomer compatibility. There are also tests for load carrying ability, acidity, foaming characteristics, volatility, corrosiveness and oxidative stability, sediment, trace element content, confined heat stability, miscibility and compatibility with other oils to the same and other specifications, coking propensity, hydrolytic stability and low-temperature viscosity stability.

**Uses:** Certain aircraft turbine engines, auxiliary equipment and in certain powered flying controls, operated over the ambient temperature range of minus 40°C to plus 200°C.

**WARNING:** This oil is unsuitable for use with natural, silicone and polychloroprene, eg Neoprene, elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** See Table 1.

**Note:** The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220  
**WARNING.**

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-225-1747	1 litre	0475	--	34B
9150-99-220-1940	5 litre	0475	++	34B
9150-99-220-1939	200 litre	--	--	34B

## SECTION 1E : OX - FLUIDS

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### OX-28

LUBRICATING OIL, MARINE GAS TURBINE ENGINE:  
Synthetic 5 cSt

**Specification:** Def Stan 91-101/3, includes OX-27  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic oil with additives.

**Characteristics:**

Viscosity at 200°C, min	...	...	1.25 mm <sup>2</sup> /s(cSt)
Viscosity at 100°C...	...	...	4.9–5.4 mm <sup>2</sup> /s(cSt)
Viscosity at 40°C, max	...	...	30 mm <sup>2</sup> /s(cSt)
Viscosity at –40°C, max	...	...	13000 mm <sup>2</sup> /s(cSt)
Pour point, max	...	...	–54°C
Flash point, open cup, min...	...	...	246°C

This specification includes tests for performance in ships gas turbine engines and extended duration elastomer compatibility. There are also tests for load carrying ability, acidity, foaming characteristics, volatility, corrosiveness and oxidative stability, sediment, trace element content, confined heat stability, miscibility and compatibility with other oils to the same and other specifications, coking propensity, hydrolytic stability, and low-temperature viscosity stability.

**Uses:** Certain marine gas turbine engines in HM ships.

Can also replace OX-22 in marine gas turbine and OX-27 in aviation gas turbine applications.

**Note:** OX-27 must not be used in lieu of this product in marine gas turbine application.

**WARNING:** This oil is unsuitable for use with natural, silicone and polychloroprene, eg Neoprene, elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-225-3834	5 litre	0475	--	--

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## SECTION 1E : OX - FLUIDS

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### OX-29

LUBRICATING OIL, SYNTHESIZED HYDROCARBON

**Specification:** Proprietary.

**Composition:** Synthetic hydrocarbon oil with additives, compatible with conventional mineral oils.

**Characteristics:** Viscosity at 40°C ... .. 28.8–35.2 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -54°C  
Flash point, closed cup, min ... .. 226°C

**Uses:** ADN3 aerial pedestals in Type 42 Destroyers.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-224-9258	20 litre	0475	--	--

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## SECTION 1E : OX - FLUIDS

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### OX-30

HYDRAULIC FLUID, PETROLEUM: Emulsifying

**Specification:** Def Stan 91-35/2.

**Composition:** Mineral oil with additives.

**Characteristics:** Colour, Lovibond Red ... .. 20-40  
Viscosity at 0°C, max ... .. 630 mm<sup>2</sup>/s(cSt)  
Viscosity at 40°C ... .. 28.8-35.2 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -30°C  
Flash point, closed cup, min ... 165°C

The specification includes tests for acidity, water content, copper corrosion, oxidation stability, rust inhibiting properties, emulsion stability, filterability, wear and fatigue tests and elastomer compatibility.

**Uses:** Emulsifiable hydraulic fluid for use in the hydraulic systems of certain submarines and ground radar installations and alternator test rigs.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-224-0325	200 litre	0475	--	34D
9150-99-831-2599	Bulk	0725	--	--

## SECTION 1E : OX - FLUIDS

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### NATO O-149

### OX-38

LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE:  
Synthetic 7.5 cSt

**Specification:** Def Stan 91-98/2  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic oil with additives.

**Characteristics:**

Viscosity at 100°C, min	...	...	7.35 mm <sup>2</sup> /s(cSt)
Viscosity at 40°C, max	...	...	36 mm <sup>2</sup> /s(cSt)
Viscosity at -40°C, max	...	...	13000 mm <sup>2</sup> /s(cSt)
Flash point, open cup, min	...	...	216°C
Pour Point, max	...	...	-54°C

The specification includes tests for performance in aircraft engines, load carrying ability, acidity, foaming characteristics, high temperature oxidative stability, sediment, trace element content, confined heat stability, corrosivity, elastomer compatibility, miscibility and compatibility with other oils to the same and other specifications, hydrolytic stability and catalytic oxidation.

**Uses:** Certain aircraft turbine engines, helicopter gearboxes and auxiliary equipment.

**WARNING:** This oil is unsuitable for use with natural and polychloroprene, eg Neoprene elastomers. It also affects certain paints and plastics.

**Standardized Alternatives:** See Table 1.

**Note:** The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220

**WARNING.**

### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-910-0591	5 litre	--	++	34B

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## SECTION 1E : OX - FLUIDS

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### OX-40

HYDRAULIC FLUID, AQUEOUS POLYGLYCOL BASED: Fire Resistant

**Specification:** Def Stan 91-110/1

**Composition:** Water, polyglycol polymers with additives.

**Characteristics:**

Colour	...	...	...	...	Green, fluorescent
Density at 15°C	...	...	...	...	Report
Viscosity at 40°C	...	...	...	...	41.4–50,6 mm <sup>2</sup> /s(cSt)
Viscosity at 0°C, max	...	...	...	...	350 mm <sup>2</sup> /s(cSt)
Pour point, max	...	...	...	...	–39°C
pH	...	...	...	...	7.5–10.0
Water content, percent volume	...	...	...	...	35–45

The specification includes tests for copper corrosion, rust inhibition in presence of sea water and compatibility with sea water, water content, additive elements and elastomer compatibility.

**Uses:** General use as a fire-resistant hydraulic fluid in systems specifically designed for this fluid. Not to be used in existing systems without the approval of the design authority.

**WARNING:** This fluid is not compatible with conventional mineral oil, conventional oil resistant paints and light metals, eg cadmium, zinc and aluminium alloys.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-721-7413	200 litre	0475	--	--
9150-99-731-2026	25 litre	0475	--	--

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SECTION 1E : OX - FLUIDS

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NATO H-536

OX-50

HYDRAULIC FLUID, CHLORINATED SILICONE

**Specification:** MIL-S-81087C  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Silicone fluid based on chlorinated diphenylmethyl polysiloxane.

**Characteristics:** Viscosity at 99°C ... .. 15-19 mm<sup>2</sup>/s(cSt)  
Viscosity at 38°C ... .. 50-60 mm<sup>2</sup>/s(cSt)  
Viscosity at -54°C, max ... .. 3500 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -73°C  
Flash point, open cup, min ... 288°C

The specification includes tests for particulate contamination acidity, fire point, lubricity and wear, volatility, gelling and corrosion/oxidation stability.

**Uses:** Constant speed drives of Wessex Mk 3 helicopter.

**WARNING:** This fluid must not be mixed with other lubricating oils or hydraulic fluids.

This fluid tends to cause certain rubbers and plastics to shrink and harden.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-01-059-1557	1 US quart	++	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS,  
Refer to appropriate service authority, page 5.**

## SECTION 1E : OX - FLUIDS

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### NATO S-1735

#### OX-70

MOLYBDENUM DISULFIDE LUBRICATING OIL, Silicone base

**Specification:** DOD-L-25681D

**Composition:** Silicone fluid, based on methylphenyl polysiloxane and molybdenum disulfide powder 50/50 percent mixture.

**Characteristics:** Viscosity of silicone fluid at 100°C ... .. 16-22 mm<sup>2</sup>/s(cSt)  
Viscosity of silicone fluid at 40°C ... .. 65-85 mm<sup>2</sup>/s(cSt)  
Flash point, open cup, min... .. 274°C

The oil and molybdenum disulfide are blended to give a homogenous mixture at the time of packing but the molybdenum disulfide powder settles at the bottom of containers during storage.

**Uses:** Lubricant for certain aircraft slow speed sliding surfaces, operated up to temperatures of 400°C.

**WARNING:** This fluid shall not be used on antifriction bearings under any circumstances.

This fluid tends to cause certain rubbers and plastics to shrink and harden.

Note: Stir well before use.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No 9150-99-224-7914	Nominal Size 500 g	Navy --	Army --	<b>RAF</b> 34B
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## SECTION 1E : OX - FLUIDS

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### OX-72

LUBRICATING OIL, STERN TUBE: Emulsifying

**Specification:** Proprietary.

**Composition:** A mineral lubricating oil with emulsifying additives.

**Characteristics:** Colour ... .. Golden yellow  
Viscosity at 40°C ... .. 70–75 mm<sup>2</sup>/s(cSt)  
Viscosity at 100°C, min ... .. 8 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -24°C  
Flash point, closed cup, min ... 180°C

**Uses:** Stern tube lubricant in Island and Castle Class offshore patrol vessels, Roysterer Class tugs and certain landing craft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-9735	25 litre	0475	--	--
9150-99-224-9734	200 litre	0475	--	--

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## SECTION 1E : OX - FLUIDS

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### NATO H-548

#### OX-75

#### HYDRAULIC FLUID, AUTOMATIC TRANSMISSION

**Specification:** This product complies with the performance requirements of GM 6417M: 1998

**Composition:** Mineral and/or synthetic hydrocarbon oils with additives.

**Characteristics:**

Viscosity at 100°C	...	...	...	6.5–9.0 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	160
Apparent viscosity at -20°C, max				1500 mPas (cP)
Apparent viscosity at -40°C, max				20000 mPas (cP)
Flash point, open cup, min	...	170°C		

The specification includes GM transmission test, tests for foaming characteristics, copper corrosion, de-aeration, oxidation stability, elastomeric compatibility, load carrying capacity and corrosion.

**Uses:** Power steering and automatic transmissions not fitted with wet brakes, normally using DEXRON fluids.

**WARNING:** This fluid is not compatible with ethylene/propylene rubbers.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-869-4113	1 litre	0475	++	34D
9150-99-869-4114	5 litre	0475	++	34D

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Note: This product implements STANAG 7093

## SECTION 1E : OX - FLUIDS

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### OX-79

TRANSMISSION FLUID TO-4 (SAE 10W)

**Specification:** This product complies with the performance requirements of Caterpillar Inc. publication TO-4.

**Composition:** Highly Refined Petroleum Mineral Base Oil and Additives.

**Characteristics:** SAE Viscosity Classification... .. SAE 10W  
Viscosity at 100°C ... .. 4.1 mm<sup>2</sup>/s (cSt)  
Flash Point, closed cup, min... .. 160°C

The specification includes tests for corrosion control, elastomer compatibility, oxidation resistance, wear and friction.

**Uses:** In powershift transmissions and hydraulic systems requiring a lubricant meeting the requirements of Caterpillar Inc. publication TO-4 where the temperature is persistently below minus 20°C.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-598-6128	20 litre	- -	++	34D
9150-99-752-2043	200 litre	- -	++	34D

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## SECTION 1E : OX - FLUIDS

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### OX-80

#### TRANSMISSION FLUID TO-4 (SAE 30)

**Specification:** This product complies with the performance requirements of Caterpillar Inc. publication TO-4.

**Composition:** Highly Refined Petroleum Mineral Base Oil and Additives.

**Characteristics:** SAE Viscosity Classification... .. SAE 30  
Viscosity at 100°C ... .. 9.3–12.5 mm<sup>2</sup>/s (cSt)  
Flash Point, closed cup, min ... .. 160°C

The specification includes tests for corrosion control, elastomer compatibility, oxidation resistance, wear and friction.

**Uses:** In powershift transmissions and hydraulic systems requiring a lubricant meeting the requirements of Caterpillar Inc. publication TO-4 at ambient temperatures above minus 20°C.

**Standardized Alternatives:** None

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-406-8020	20 litre	--	++	34D
9150-99-682-6446	200 litre	--	++	34D

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## SECTION 1E : OX - FLUIDS

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### OX-85

#### TRANSMISSION FLUID

**Specification:** This product complies with the performance requirements of both:

Ford ESEN – M2C 86B  
Massey Ferguson CMS M1135: 1980

**Composition:** Mineral oil with additives.

**Characteristics:**

Viscosity at 100°C	...	...	...	10–11 mm <sup>2</sup> /s(cSt)
Viscosity at 40°C	...	...	...	75–86 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	105
Pour point, max	...	...	...	–27°C
Flash point, open cup, min	...	...	...	210°C

**Uses:** Where specified for automatic transmissions fitted with metal sintered wet brakes operating at ambient temperatures above –20°C.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-282-3293	25 litre	--	++	34D

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## SECTION 1E : OX - FLUIDS

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### OX-87

HYDRAULIC FLUID: Aircraft

**Specification:** DTD 900/6103A (AFS 1897) Nimor 87

**Composition:** Polyalkalene glycol ethers, polyalkalene glycols and inhibitors.

**Characteristics:** Density 20°C ... .. 1.01–1.03 gm/cm<sup>3</sup>  
Viscosity at 40°C, min ... .. 4.5 mm<sup>2</sup>/s(cSt)  
Viscosity at 0°C, max... .. 22 mm<sup>2</sup>/s(cSt)  
Viscosity at –40°C, max ... .. 1000 mm<sup>2</sup>/s(cSt)  
Flash point, open cup, min ... 95°C  
Cloud point, max ... .. –40°C  
Reflux boiling point, min ... .. 200°C

The specification also includes tests for pour point, ash, low temperature stability and effect on standard IR rubber.

**Uses:** Hydraulic systems in Nimrod and Comet aircraft only. Known previously as Nimor 87 and replaces OF-4 in both systems.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-770-2899	20 litre	--	--	34B
9150-99-617-3398	5 litre	--	--	34B

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**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.



## SECTION 1E : OX - FLUIDS

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### OX-95

LUBRICATING OIL, COMPRESSOR: Synthetic

**Specification:** Proprietary.

**Composition:** Synthetic oil with additives.

**Characteristics:** Viscosity at 40°C ... .. 95 mm<sup>2</sup>/s(cSt) approx  
Viscosity at -18°C ... .. 20000 mm<sup>2</sup>/s(cSt) approx  
Pour point ... .. -30°C  
Flash point, closed cup, min 266°C

**Uses:** Cylinder and crankcase lubricant for air-cooled high-pressure compressors including those used for diving air.

**WARNING:** This oil is unsuitable for use with certain rubbers. It also affects certain paints and plastics.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-225-3824	1 litre	0475	++	34D
9150-99-225-3825	5 litre	0475	--	34D

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## SECTION 1E : OX - FLUIDS

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### OX-125

#### HELICOPTER TRANSMISSION LUBRICANT

**Specification:** Will be implemented by Def Stan 91-69.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic Hydrocarbons with additives.

**Characteristics:** Viscosity at 100°C ... .. 8.75 - 9.25 mm<sup>2</sup>/s(cSt)  
Viscosity at -32°C max ... .. 13,000 mPa.s(cP)  
Pour point max ... .. -40°C  
Flash point, closed cup, min ... .. 232°C

The specification includes tests for acidity, oxidation stability, corrosion inhibiting properties, elastomer compatibility, evaporation loss, foaming characteristics, specific heat and load carrying capacity.

**Uses:** In certain helicopter transmission systems, temperature range minus 40 to +150°C

#### Standardized Alternatives:

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
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## SECTION 1E : OX - FLUIDS

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### OX-165

LUBRICATING FLUID, GEAR: Synthetic

**Specification:** Def Stan 91-71/2.

**Composition:** Polyalkylene glycol with additives.

**Characteristics:** Viscosity at 100°C ... .. 20.0-25.0 mm<sup>2</sup>/s(cSt)  
Viscosity index, min. ... .. 160  
Flash point, open cup, min ... 255°C

The specification includes tests for acidity, oxidation stability, corrosion protection of steel and various other metals, low temperature stability, evaporation loss, foaming characteristics and load carrying capacity and miscibility.

**Uses:** Spiral bevel gears and in transmissions incorporating a hydraulic steering system and in aircraft arrester barriers, operated over the temperature range of minus 40°C to plus 150°C. Also in fuel and Lubricant Oil (LO) centrifuges.

**WARNING:** This material is not intended for use with conventional hypoid gears. This oil is incompatible with mineral oils. It must not be used as a top up fluid for addition to equipment containing mineral oils.

This material may also have deleterious effects on certain elastomers, paint systems and leather.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-225-2356	25 litre	0475	++	34D

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## SECTION 1E : OX - FLUIDS

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### OX-300

LUBRICATING OIL, STERN TUBE: Emulsifying

**Specification:** Proprietary.

**Composition:** Mineral and fatty oil with additives.

**Characteristics:** Colour ... .. Green  
Viscosity at 60°C ... .. 98–110 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. 3°C  
Flash point, closed cup, min ... .. 165°C

The specification includes tests for free fatty acids, emulsification and emulsion stability.

**Uses:** Stern tube lubricant in certain marine craft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-7379	22 kg	0475	--	--
9150-99-224-7378	185 kg	0475	--	--

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SECTION 1E : OX - FLUIDS

NATO H-538

OX-538

HYDRAULIC FLUID, FIRE RESISTANT:

Low temperature, synthetic hydrocarbon base, aircraft and missile

**Specification:** MIL-PRF-87257A. This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Synthetic hydrocarbons containing up to 35 percent mass of diesters, with additives.

**Characteristics:** Colour... .. Red  
Viscosity at 100°C min... .. 2.0 mm<sup>2</sup>/s(cSt)  
at 40°C min ... .. 6.7mm<sup>2</sup>/s(cSt)  
at -40°C max ... .. 550mm<sup>2</sup>/s(cSt)  
at -54°C max ... .. 2,500mm<sup>2</sup>/s(cSt)  
Flash point, open cup, min ... .. 160°C  
Fire point, open cup, min ... .. 170°C  
Pour point max ... .. -60°C

This specification includes tests for specific gravity, acidity or alkalinity bulk modules, corrosion and oxidation stability, swelling of synthetic rubber, solid particle contamination, foaming characteristics, lubricity water content compatibility, low and high temperature stability and storage stability.

**Uses:** For hydraulic systems in certain aircraft.

**Standardized Alternative:** None

**Store Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-239-2250	1 litre	--	--	34B
9150-99-285-3752	5 litre	--	--	34B

**SECTION 1E : OX - FLUIDS**

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## **SECTION 2 : XG-GREASES**

SECTION 2 : XG-GREASES

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**NATO G-363**

**XG-235**

GREASE, PLUG VALVE, HYDROCARBON RESISTANT

**Specification:** Def Stan 91-6/4.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Animal, vegetable or synthetic oil with a gelling agent.

**Characteristics:** Penetration, unworked ... .. 180-260  
Dropping point, min ... .. 125°C

The specification includes tests for copper corrosion, resistance to fuel and water, grease film stability, corrosion of steel.

**Uses:** Lubricant for glands and cocks in fuel and oil supply systems.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-944-0585	500 g	0475	--	34B

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**NATO S-736**

**XG-250**

SILICONE COMPOUND: Electrical insulating

**Specification:** Def Stan 68-69/1.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Silicone fluid and a gelling agent.

**Characteristics:** Penetration, unworked ... .. 190-250  
Penetration, worked, max ... .. 310  
Volume resistivity at 23°C, min ... 1.0 x 10<sup>14</sup> ohm.cm<sup>-1</sup>

The specification includes tests for oil separation, evaporation loss, low temperature stability, freedom from abrasive particles, freedom from corrosive action on metals, effect on rubber, waterproof sealing properties, electrical proof strength, power factor, permittivity and storage stability.

**Uses:** Protective insulating compound as a filling and coating material in electrical equipment and installations, suitable over the temperature range of minus 50°C to plus 200°C.

Protection of all aluminium alloy fittings in HM ships, bushes, engine mountings, components of hydraulic equipment.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
5970-99-220-2421	50 g	0475	++	--
5970-99-224-8408	1 kg	0475	++	34B
5970-99-224-4975	400 g Aerosol	--	++	34B

PSN: Aerosols  
UN No: 1950  
UN Class: 2.1  
Packaging Group N/A

SECTION 2 : XG-GREASES

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**XG-261**

GREASE, SILICONE

**Specification:** AFS 990C Molykote 44 Grease-Medium

**Composition:** Silicone fluid and a gelling agent.

**Characteristics:** Penetration, worked ... .. 240-280  
Dropping point, min ... .. 200°C

The specification includes tests for foreign particles, oil separation, evaporation loss and copper corrosion.

**Uses:** Roller bearings of radar pedestals in HM ships.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-225-3133	100 g	0475	--	34B

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SECTION 2 : XG-GREASES

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**NATO G-412**

**XG-264**

GREASE, GRAPHITE: Medium

**Specification:** Def Stan 91-18/2.

**Composition:** Ninety five parts of product XG-279 and five parts of graphite powder.

**Characteristics:** Penetration, worked ... .. 240-300

The specification includes a test for graphite content.

**Uses:** General purpose lubricant where a graphited grease is required, for leaf springs and lift guides, protective for wire ropes, certain antiseize applications, operated over the temperature range of minus 54°C to plus 105°C.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-220-5175	21 gm	--	++	34D
9150-99-220-1049	3 kg	0475	++	34D

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SECTION 2 : XG-GREASES

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**NATO G-392**

**XG-269**

GREASE, AIRCRAFT:Synthetic, pneumatic system

**Specification:** SAE-AMS-G-4343  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Liquid lubricant and a gelling agent.

**Characteristics:** Penetration, worked ... .. 260-300  
Dropping point, min ... .. 163°C

The specification includes tests for apparent viscosity, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, rust preventive properties, effects on rubber and storage stability.

**Uses:** Lubricant for certain specified components in Hercules aircraft, operated over the temperature range of minus 55°C to plus 95°C and pressures up to 14 mPa.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-00-269-8255	1lb	--	--	34B

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**NATO G-382**

**XG-271**

GREASE, AIRCRAFT: General purpose

**Specification:** Def Stan 91-12/1.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oil and a gelling agent.

**Characteristics:** Penetration, worked ... .. 265-340  
Dropping point, min ... .. 149°C

The specification includes tests for foreign particles, working stability, oil separation, copper corrosion, oxidation stability, low temperature torque, water resistance, elevated temperature performance, rust preventive properties and storage stability.

**Uses:** General purpose lubrication of high speed ball and roller bearings, plain bearings, internal combustion engine accessories, and certain fire control instruments over the operating temperature range minus 40°C to plus 120°C.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0510	125 g	0475	--	34B
9150-99-943-1550	500 g	0475	++	34B
9150-99-910-0511	3 Kg	0475	++	34B
9150-99-168-6147	12.5 Kg	--	++	--

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SECTION 2 : XG-GREASES

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**XG-273**

GREASE: Synthetic, graphite

**Specification:** Def Stan 91-85/1

**Composition:** 9 parts of product XG-287 and 1 part graphite powder.

**Characteristics:** Penetration, worked ... .. 265-295

The specification includes tests for graphite content, oil separation and copper corrosion.

**Uses:** Lubricant for leaf springs and lift guides, steel wire ropes and Bowden cables, machine guns and small arms in hot dusty conditions.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-787-3633	50 g	--	++	34B
9150-99-942-3151	125 g	--	++	34B

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SECTION 2 : XG-GREASES

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**NATO G-353**

**XG-276**

GREASE: Synthetic, molybdenum disulfide

**Specification:** Def Stan 91-57/2.

**Composition:** 95 parts of product XG-287 and 5 parts of product ZX-35.

**Characteristics:** Penetration, worked ... .. 265-295

The specification includes tests for molybdenum disulfide content and oil separation.

**Uses:** Certain heavily loaded sliding applications and anti-friction bearings carrying high loads over the temperature range minus 73°C to plus 120°C.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-942-5139	125 g	0475	++	34B
9150-99-224-7683	3 kg	0475	++	34B
9150-99-593-2251	12.5 kg	--	++	34B

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**NATO G-403****XG-279**

GREASE, AUTOMOTIVE AND ARTILLERY

**Specification:** Def Stan 91-27/2.\***Composition:** Mineral oil and a gelling agent.

**Characteristics:** Penetration, worked... .. 265-295  
 Dropping point, min ... .. 130°C

The specification includes tests for foreign particles, oil separation, evaporation loss, water absorption, copper corrosion, oxidation stability, working stability in the presence of water, roll stability, roller bearing performance, extreme pressure properties, wear preventive characteristics, rust preventive properties, apparent viscosity at minus 54°C and storage stability.

**Uses:** General purpose lubricant for automotive and artillery applications, operated over the temperature range of minus 54°C to plus 105°C.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-250-7742	500 g	0475	--	--
9150-99-220-2418	3 kg	0475	++	34D
9150-99-220-1149	12.5 kg	0475	++	34D
9150-99-220-2731	25 kg	--	++	34D
9150-99-220-1150	50 kg	--	++	34D

\* Note: This product implements STANAG 7092.



SECTION 2 : XG-GREASES

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**NATO G-366**

**XG-284**

GREASE, AIRCRAFT: Helicopter oscillating bearing

**Specification:** Def Stan 91-51/1 .  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Low temperature liquid lubricant and a gelling agent.

**Characteristics:** Penetration, worked ... .. 265-305  
Dropping point, min ... .. 138°C

The specification includes tests for foreign particles, unworked penetration, working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance, rust preventive properties and storage stability.

**Uses:** General purpose lubricant for helicopter and aircraft antifretting applications, operated over the temperature range of minus 55°C to plus 75°C.

**WARNING:** This grease should not be used in ball and roller bearings, operated at high temperatures or speeds.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-943-9321	500 g	0475	++	34B
9150-99-224-7907	3 kg	--	++	34B
9150-99-220-2310	12.5 kg	--	--	34B

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SECTION 2 : XG-GREASES

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**NATO G-355**

**XG-285**

GREASE, AIRCRAFT: Graphite

**Specification:** Def Stan 91-54/1.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oil with a gelling agent and 5 percent of graphite powder.

**Characteristics:** Penetration, worked ... .. 265-340  
Dropping point, min ... .. 150°C

The specification includes tests for graphite content, working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance and storage stability.

**Uses:** For use over the operating temperature range minus 40°C to plus 120°C in heavily loaded intermittent applications such as aircraft combustion starter gears and slow moving plain bearings and sliding surfaces.

**WARNING:** This grease should not be used in ball and roller bearings, operated at high temperatures or speeds.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0517	125 g	0475	++	34B
9150-99-923-0474	3 kg	0475	++	34B

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SECTION 2 : XG-GREASES

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**NATO G-460**

**XG-286**

GREASE, SEA WATER RESISTING

**Specification:** Def Stan 91-34/2.

**Composition:** Lubricating oil and water resistant soaps.

**Characteristics:** Penetration, worked ... .. 265-295  
Dropping point, min ... .. 130°C

The specification includes tests for oil separation, copper corrosion, water resistance and rust preventive properties.

**Uses:** Lubrication and protection against corrosion of mechanisms submerged in sea water or subject to wave action and the washing effect of heavy seas.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-224-8885	3 kg	0475	++	34B

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SECTION 2 : XG-GREASES

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**NATO G-354**

**XG-287**

GREASE: Multi-purpose, low temperature range

**Specification:** Def Stan 91-53/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic lubricant with gelling agent and extreme pressure additives.

**Characteristics:** Penetration, worked ... .. 265-295  
Dropping point, min ... .. 180°C

The specification includes tests for oil separation, evaporation loss, oxidation stability, copper corrosion, water absorption, elastomer compatibility, working stability, low temperature torque, extreme pressure properties, wheel bearing leakage, roll stability, water washout, rust prevention, apparent viscosity, rolling bearing and elevated temperature performance and storage stability.

**Uses:** General purpose lubricant for aircraft accessories, instruments gears, actuators and other mechanisms where high load carrying capacity is required, operated over the temperature range of minus 73°C to plus 120°C where satisfactory performance in the presence of water is required.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-1793	125 g	0475	++	34B
9150-99-350-6234	4.5 kg	--	--	34B
9150-99-224-1861	12.5 kg	0475	++	34B

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**NATO G-421**

**XG-291**

GREASE: Multipurpose, heavy duty

**Specification:** Def Stan 91-105/1\*

**Composition:** Mineral oil and/or synthetic hydrocarbon oil poly alphaolefin (PAO) with gelling agent and additives.

**Characteristics:** Penetration, worked ... .. 265-295  
 Dropping point, min ... .. 230°C

The specification includes tests for viscosity of base oil, oil separation, evaporation loss, oxidation stability, copper corrosion, water absorption, elastomer compatibility, working stability, low temperature torque, extreme pressure properties, wheel bearing leakage, roll stability, water washout, rust prevention, apparent viscosity, rolling bearing and elevated temperature performance, churning and storage stability.

**Uses:** Lubrication of gears, anti-friction bearings, plain bearings and other mechanisms over the temperature range of minus 30°C to plus 140°C, where satisfactory performance in the presence of water is required.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-918-3786	500 g	0475	--	34D
9150-99-838-1808	3 kg	0475	--	--

---

\* NOTE: This product implements STANAG 7092.

## SECTION 2 : XG-GREASES

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### NATO G-395

#### XG-293

GREASE, AIRCRAFT: Multipurpose

**Specification:** Def Stan 91-52/1.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Wide temperature range liquid lubricant and a high melting gelling agent.

**Characteristics:** Penetration, worked ... .. 265-320  
Dropping point, min ... .. 232°C

The specification includes tests for foreign particles, working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance, load carrying capacity, steel/steel wear, elevated temperature performance, rust preventive properties, gear wear, friction and wear under oscillating conditions, effect on rubber and storage stability.

**Uses:** Wheel bearings, antifriction bearings, plain bearings, gearboxes and aircraft accessories, operated over the temperature range of minus 55°C to plus 175°C. Reactor compartments of nuclear submarines.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-224-1797	500 g	0475	++	34B
9150-99-513-5131	12.5 kg	--	--	34B

SECTION 2 : XG-GREASES

---

**G-1352**

**XG-294**

GREASE: Multi-purpose, elevated temperature range

**Specification:** Def Stan 91-106/1  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Synthetic hydrocarbon lubricant with gelling agent and extreme pressure additives.

**Characteristics:** Penetration, worked ... .. 265-295  
Dropping point, min ... .. 230°C

The specification includes tests for oil separation, evaporation loss, oxidation stability, copper corrosion, water absorption, elastomer compatibility, working stability, low temperature torque, extreme pressure properties, anti-wear properties, wheel bearing leakage, roll stability, water washout, rust prevention, apparent viscosity, rolling bearing performance, elevated temperature performance and storage stability.

**Uses:** Lubrication of gearboxes, anti-friction bearings, plain bearings and other mechanisms over the temperature range of minus 54°C to plus 175°C, and where satisfactory performance in the presence of water is required.

**Standardized Alternatives:**

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-855-1324	500 g	--	--	34B
9150-99-376-9100	12.5 kg	--	--	34B

---

SECTION 2 : XG-GREASES

---

**NATO G-372**

**XG-300**

GREASE, AIRCRAFT: Synthetic, high temperature

**Specification:** MIL-G-25013E.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Liquid lubricant with a gelling agent and additives.

**Characteristics:** Penetration, worked ... .. 260-320  
Dropping point, min ... .. 230°C

The specification includes tests for working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, elevated temperature performance, water resistance, rust preventive properties and storage stability.

**Uses:** Lubricant for lightly loaded high speed anti-friction bearings and certain aircraft actuators and similar equipment, certain equipment in submarines and where conventional soap thickened greases would be unsuitable, operated over the temperature range of minus 75°C to plus 230°C.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-01-234-5866	1 lb	--	--	34B

---



## SECTION 2 : XG-GREASES

---

### XG-305

#### GREASE, MOLYBDENUM DISULFIDE

**Specification:** Def Stan 91-64/2.

**Composition:** Liquid lubricant with a gelling agent and 3 percent min of molybdenum disulfide.

**Characteristics:** Penetration, worked ... .. 265-295  
Dropping point, min ... .. 180°C

The specification includes tests for working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance, extreme pressure properties, rust preventive properties and storage stability.

**Uses:** Lubricant for heavily loaded applications and for certain antiseize uses, operated over the temperature range of minus 20°C to plus 120°C.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-814-8952	500 g	--	++	34D
9150-99-760-7160	3 kg	0475	--	34D
9150-99-935-6295	12.5kg	0475	--	--

---

SECTION 2 : XG-GREASES

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**NATO G-394**

**XG-315**

GREASE: Silicone, metal to rubber

**Specification:** Def Stan 91-56/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Silicone fluid, gelling agent and additives.

**Characteristics:** Penetration, worked ... .. 265-295  
Dropping point, min ... .. 200°C

The specification includes tests for oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, effect on rubber and storage stability.

**Uses:** Metal to rubber lubrication, except silicone rubbers, especially in aircraft pneumatic systems and guided weapons.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1438	100 g	0475	++	34B
9150-99-220-4466	200 g	--	--	34B
9150-99-944-0603	1 kg	0475	--	--

---

SECTION 2 : XG-GREASES

---

**XG-344**

GREASE, AIRCRAFT: High temperature

**Specification:** DTD 900/4872A, (AFS 594A) Mobilplex 47

**Composition:** Mineral oil and a gelling agent.

**Characteristics:** Penetration, worked ... .. 265-295  
Dropping point, min ... .. 260°C

The specification includes tests for water content, load carrying capacity and leakage from a wheel bearing.

**Uses:** Certain aircraft turbine engine starters and high temperature electric motor bearings in HM ships.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-5056	500 g	0475	--	--
9150-99-224-9259	3 kg	0475	--	34B

---

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

SECTION 2 : XG-GREASES

---

**XG-380**

GREASE, PUMPABLE CALCIUM BASE

**Specification:** Def Stan 91-111/1

**Composition:** Low viscosity mineral oil and water insoluble soap, normally calcium soap.

**Characteristics:** Dropping point, min ... .. 130°C

The specification includes tests for, copper corrosion, oil separation and apparent viscosity at minus 40°C.

**Uses:** Lubricant for exposed parts of Naval gun mountings at low temperatures, torpedoes and for Naval missile handling gear.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-910-0504	3 kg	0475	--	--

SECTION 2 : XG-GREASES

---

**XG-460**

GREASE, NAVAL: Graphite

**Specification:** Proprietary.

**Composition:** Semi-fluid grease containing gelling agent, graphite and extreme pressure additives.

**Uses:** Breech-blocks of guns.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
9150-99-910-0524	3 kg	0475	--	34D

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## SECTION 3 : ZX-SPECIALITIES

### SECTION 3 : ZX - SPECIALITIES

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#### ZX-9

CUTTING FLUID, SOLUBLE, BIOSTABLE

**Specification:** Def Stan 91-70/1.

**Composition:** Mineral oil with emulsifiers and additives.

**Characteristics:** Flash point, closed cup, min ... .. 70°C

The specification includes tests for copper corrosion, pH value, cast iron corrosion, fluid stability, frothing tendency, thermal stability, resistance to bacterial and fungal attack. Forms a stable translucent dispersion in hard or soft water.

**Uses:** General purpose coolant and lubricant for metal machining operations. The concentration is varied according to the cutting or grinding operation and the hardness of the water.

**WARNING:** Add ZX-9 to water, not water to ZX-9 when mixing.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9150-99-108-3103	25 litre	0475	++	34D

---



## SECTION 3 : ZX - SPECIALITIES

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### NATO S-720

#### ZX-13

ANTISEIZE COMPOUND: Graphite

**Specification:** Def Stan 80-80/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Equal parts of grease and graphite powder .

**Characteristics:** Penetration, worked ... .. 170-260  
Dropping point, min ... .. 100°C

The specification includes a test for graphite content.

**Uses:** Sparking plug thread antiseize compound and certain other threaded fittings operated up to 500°C.

**WARNING:** This compound shall not be used for oxygen equipment or systems. See ZX-24 for low-pressure aircraft oxygen systems.

ZX-13 is an electrical conductor. When used on sparking plugs it shall not be allowed to come into contact with the terminal or electrode.

This product is not intended as a general purpose lubricant and ZX-13 shall not be used in ball and roller bearings.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No 8030-99-910-0528	Nominal Size 500 g	Navy 0475	Army ++	RAF 34B
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### SECTION 3 : ZX - SPECIALITIES

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**C-608**

**ZX-21**

**Specification:** MIL-C-6529C Type 1.  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Additive concentrate of corrosion inhibitors in mineral oil.

**Characteristics:**

Viscosity at 99°C	...	...	...	18–21 mm <sup>2</sup> /s(cSt)
Viscosity index, min	...	...	...	95
Pour point, max	...	...	...	-12°C
Flash point, open, min	...	...	...	204°C

The specification includes tests for carbon residue, ash, precipitation number, copper corrosion, stability at high and low temperatures and volatility.

**Uses:** A component of an inhibiting oil for aircraft engine transmissions.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-910-5062	25 litre	--	--	34B

---

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

### SECTION 3 : ZX - SPECIALITIES

---

#### NATO S-718

#### ZX-24

ANTISEIZE COMPOUND: Aircraft, oxygen system

**Specification:** DTD 900/4042A, (AFS 355A) Acheson Aquadag.

**Composition:** Stabilized dispersion of colloidal graphite in water.

**Characteristics:** Black fluid.

**Uses:** Antiseize compound for low pressure aircraft oxygen systems.

Note: Stir well before use.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-942-7802	75 g	--	--	34B

---

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

### SECTION 3 : ZX - SPECIALITIES

---

#### ZX-30

LUBRICANT, SOLID FILM: Unbonded, graphite dispersion

**Specification:** DTD 900/4639, Acheson Dag 580.

**Composition:** Stabilized dispersion of colloidal graphite in ethanol.

**Characteristics:** Black fluid.

**Uses:** Unbonded dry film lubricant coating for bomb release mechanisms and certain antiseize applications.

Note: Stir well before use.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-944-0586	1 kg	0475	--	--
9150-99-600-6847	4.5 kg	--	++	--

---

PSN: Paint

UN No: 1263

UN Class: 3

Packaging Group: III

**THIS PRODUCT SHOULD NOT BE USED IN  
NEW APPLICATIONS OR DESIGNS**

Refer to appropriate service authority, page 5

## SECTION 3 : ZX - SPECIALITIES

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### NATO S-1738

#### ZX-34

LUBRICANT, SOLID FILM: Heat cured

- Specification:** SAE AS5272 TYPE I  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.
- Composition:** Molybdenum disulphide powder and a resin binder dispersed in a solvent .
- Characteristics:** The specification includes tests for appearance, adhesion, thermal shock stability, resistance to various fluids, endurance life, load carrying capacity and corrosion resistance of the cured coating and storage stability of the dispersion.
- Uses:** Bonded dry film lubricant for metal surfaces.

Note: Stir well before use.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-225-0980	500 g	--	--	34B

---

PSN: Flammable Liquid NOS (contains Xylene)

UN No: 1993

UN Class: 3

Packaging Group: III

### SECTION 3 : ZX - SPECIALITIES

---

#### NATO S-740

#### ZX-35

#### MOLYBDENUM DISULFIDE POWDER, LUBRICATING

**Specification:** Def Stan 68-62/2.

**Composition:** Molybdenum disulfide powder.

**Characteristics:** A fine powder of which 100, 99 and 95 percent shall pass through a 150, 75 and 63 micrometre mesh sieve, respectively. The specification includes tests for molybdenum and sulfur content, insoluble matter, acetone and water soluble matter and abrasiveness.

**Uses:** Boundary lubricant, an ingredient in certain greases and bonded coating compositions.

**WARNING:** This product shall not be added to any lubricant without the prior written agreement of the appropriate service Authority. See page 5.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
6810-99-220-5785	500 g	0475	++	34B

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**SECTION 3 : ZX - SPECIALITIES**

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**ZX-36**

LUBRICANT, ELECTRICAL SLEEVING

**Specification:** DTD 900/4877A, (AFS 611A) Hellerine Grade M.

**Composition:** Transparent viscous oil.

**Uses:** Lubricant for the sleeves of electrical cables .

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-220-3658	250 ml	0475	++	34B

---

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**  
Refer to appropriate service authority, page 5.

### SECTION 3 : ZX - SPECIALITIES

---

#### NATO S-722

#### ZX-38

ANTI-SEIZE COMPOUND: Molybdenum disulfide

**Specification:** Def Stan 80-81/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oil and a gelling agent containing not less than 50 percent ZX-35.

**Characteristics:** Penetration, worked ... .. 200-300  
Dropping point, min ... .. 100°C

The specification includes tests for copper corrosion and molybdenum disulfide content.

**Uses:** Anti-seize and anti-scuffing compound for metal parts, operated over the temperature range of up to 250°C.

**WARNING:** This compound is not intended as a general purpose lubricant.

This product shall not be used on ball and roller bearings.

ZX-38 is not for use with gaseous or liquid oxygen.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
8030-99-224-9248	100 g	0475	++	34B
8030-99-224-9249	500 g	0475	--	34B

---



### SECTION 3 : ZX - SPECIALITIES

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#### ZX-40

GREASE, STERN TUBE: Emulsifying

**Specification:** Proprietary.

**Composition:** Petrolatum and emulsifying additives.

**Characteristics:** Colour ... .. Green  
Penetration, unworked ... .. 140-170  
Flash point, closed cup, min ... .. 200°C

**Uses:** Stern tube lubricant and for other applications in certain marine craft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-220-1628	3 kg	0475	--	--



### SECTION 3 : ZX - SPECIALITIES

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#### ZX-41 to ZX-53

DAMPING FLUIDS: Dimethyl silicone

**Specification:** Def Stan 91-46/2.

**Composition:** Silicone fluids based on dimethyl polysiloxanes.

**Characteristics:** The above Standard specifies a range of fluids with the following characteristics:

Joint Service Designation	NATO Code	Viscosity grade at 25°C mm <sup>2</sup> /s(cSt)	Flash point, min °C
ZX-41	S-1712	3	90
ZX-42	S-1714	10	144
ZX-43	S-1716	20	186
ZX-44	S-1718	50	234
ZX-45	S-1720	100	249
ZX-46	-	500	270
ZX-47	-	1000	270
ZX-48	S-1724	7500	276
ZX-49	-	12500	276
ZX-50	S-1726	20000	276
ZX-51	-	60000	276
ZX-52	S-1728	100000	276
ZX-53	S-1732	200000	276

The specification includes tests for colour, haze, acidity, volatility, refractive index and permittivity.

These fluids are colourless, odourless, water repellent, chemically inert, and have good dielectric properties.

All these fluids are highly compressible and have low rates of change of viscosity with temperature.

Note: See the following page 153 for **Uses, WARNING, Standardized Alternatives, and Stores Numbers.**

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### SECTION 3 : ZX - SPECIALITIES

---

**Uses:** Damping, transducer and dielectric fluids in radar, radio and missile equipment. Also used as heat transfer fluids.

**WARNING:** These fluids shall not be mixed with any lubricant or hydraulic fluid.

They shall not be used as water displacing fluids.

These products are not effective as lubricants, steel/steel, at high loads.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:** As detailed below.

Joint Service Designation	NATO Stock Number	Nominal Size	Navy	Army	RAF
ZX-42	9150-99-770-7553	400 g	--	--	34B
ZX-43	9150-99-220-2534	500 g	0475	--	34B
ZX-44	9150-99-220-1503	100 ml	0475	--	--
ZX-44	9150-99-220-2924	500 g	--	++	34B
ZX-45	9150-99-220-5612	100 ml	0475	--	--
ZX-45	9150-99-220-3409	500 g	--	--	34B
ZX-46	9150-99-220-1235	500 g	0475	++	34D
ZX-47	9150-99-220-5616	100 ml	0475	--	--
ZX-47	9150-99-220-3410	1 kg	--	--	34B
ZX-51	9150-99-220-3543	500 g	--	--	34B
ZX-52	9150-99-220-6068	500 g	--	--	--

## SECTION 3 : ZX - SPECIALITIES

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### ZX-54

COMPOUND: Rust penetrating oil

**Specification:** Def Stan 91-72/1.

**Composition:** Unpigmented petroleum materials, corrosion inhibitors and low aromatic hydrocarbon solvent.

**Characteristics:** Flash point, closed cup, min ... 32°C.

The specification includes tests for corrosion prevention and rust penetration.

**Uses:** As release agent for rusted and corroded components and fasteners etc.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
8030-99-923-1633	400 ml Aerosol	--	++	--
9150-99-453-7068	250 ml	0475	++	--
9150-99-684-3867	5 litre	0475	++	--

---

For (8030-99-923-1633)

PSN: Aerosols

UN No: 1950

UN Class: 2.1

Packaging Group: N/A

For (9150-99-453-7068) and (9150-99-684-3867)

PSN: Petroleum Distillates NOS (contains Naphtha)

UN No: 1268

UN Class: 3

Packaging Group: II

### SECTION 3 : ZX - SPECIALITIES

---

#### NATO S-749

#### ZX-55

LUBRICANT: Solid film air drying corrosion inhibiting

**Specification:** MIL-L-23398D Amdt 2  
This specification involves US qualification procedures. For products currently approved, see page 5, Service Authority.

**Composition:** Molybdenum disulfide with resin binder system.

**Characteristics:** The specification includes tests for film thickness and adhesion, resistance to water, load carrying characteristics and aluminium corrosion resistance.

**Uses:** Air curing bonded dry film lubricant for metal surfaces.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-33-002-1389	500ml Aerosol	--	--	34B

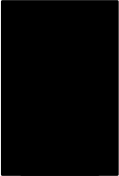
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PSN: Flammable Liquid, N.O.S. (contains isopropanol / butanol)

UN No: 1993

UN Class: 3

Packaging Group: II



**SECTION 3 : ZX - SPECIALITIES**

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## **SECTION 4 : PX-CORROSION PREVENTIVES**

## SECTION 4 : PX - CORROSION PREVENTIVES

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### NATO C-614

#### PX-1

CORROSION PREVENTIVE COMPOUND: Soft film, cold application

- Specification:** Def Stan 80-217/1.  
This specification covers two grades, DYED and UNDYED but only the undyed grade is available currently.
- Composition:** The undyed grade consists of lanolin and white spirit only.  
(The dyed grade also contained a small quantity of xylene and a green dye)
- Characteristics:** A thin soft film, which hardens slightly on ageing, is left when the solvent evaporates. The film does not withstand rubbing, hence treated articles should be wrapped, with the minimum of handling, in grease resistant wrapping. Owing to the low melting point of lanolin, 34°C to 40°C, PX-1 is unsuitable for high storage temperatures.
- Total solids, percent, mass     ...     ...     28-32
- The specification includes tests for water content and film forming properties.
- Uses:** Short-term preservation in temperate climates. Protection of certain engine cylinders, valve gear, complete engines and gun barrels. Preservation of ferrous and light alloy sheets in storage.
- Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
8030-99-910-0478	5 litre	0475	++	34B
8030-99-910-0479	25 litre	--	--	34B

Dyed Grade: Not provisioned by the RN, Army and RAF.

---

PSN: Flammable Liquid, N.O.S. (contains turpentine substitute).  
UN No: 1993  
UN Class: 3  
Packaging Group: III



## SECTION 4 : PX - CORROSION PREVENTIVES

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### NATO C-642

#### PX-4

CORROSION PREVENTIVE OIL: Thin film

**Specification:** Def Stan 80-34/3.

**Composition:** Mineral oil with corrosion and oxidation inhibitors.

**Characteristics:** Viscosity at 100°C ... .. 12.5-16.3 mm<sup>2</sup>/s(cSt)  
Pour point, max ... .. -20°C  
Flash point, closed cup, min ... 150°C

The specification includes tests for copper corrosion, corrosiveness and oxidation stability, corrosion protection of steel and film forming properties.

**Uses:** Preservation of internal metal surfaces, steel components prior to wrapping, packaging or storage, land and marine IC engines, automotive components, small mechanisms, certain fuze parts, aluminium and phosphated steel sheets.

**Note:** Not always essential to remove this prior to use of certain equipment. If in doubt consult the appropriate Service Authority. See Page 5.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
8030-99-943-1320	5 litre	0475	++	34D
8030-99-910-0484	25 litre	0475	--	34D
8030-99-522-0381	200 litre	--	--	34D

---

PSN: Barium Compound, N.O.S. (contains Barium Salt).

UN No: 1564

UN Class: 6.1

Packaging Group: III

## SECTION 4 : PX - CORROSION PREVENTIVES

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### PX-6

PETROLATUM, TECHNICAL: Hard

**Specification:** Def Stan 91-38/1, includes PX-7.

**Composition:** A stiff, tacky petrolatum.

**Characteristics:** Penetration, unworked ... .. 90-140  
Viscosity at 100°C ... .. 17-25 mm<sup>2</sup>/s(cSt)  
Melting point, min ... .. 64°C  
Flash point, closed cup, min ... 235°C

The specification includes tests for acidity, ash, saponification value and volatile matter.

**Uses:** Preservation of torpedoes and various ordnance stores.

As an ingredient of PX-11.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-943-1548	3 kg	0475	--	--
9150-99-910-0485	12.5 kg	0475	--	34D

---

## SECTION 4 : PX - CORROSION PREVENTIVES

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### NATO S-743

#### PX-7

#### PETROLATUM, TECHNICAL

**Specification:** Def Stan 91-38/1, includes PX-6.

**Composition:** Soft petrolatum.

**Characteristics:** Penetration, worked ... .. 230-275  
Melting point, min ... .. 40°C  
Flash point, closed cup, min ... 205°C

The specification includes tests for acidity, ash, saponification value and volatile matter.

**Uses:** Preservation of battery terminals, certain torpedo mechanisms and components.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-910-0488	100 g	0475	++	34B
9150-99-943-2033	3 kg	0475	++	34B



## SECTION 4 : PX - CORROSION PREVENTIVES

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### PX-11

CORROSION PREVENTIVE:  
Soft film, hot application

**Specification:** Def Stan 80-85/1.

**Composition:** PX-6 + 10% beeswax.

**Characteristics:** Melting point ... .. 65°C

The specification includes tests for saponification number, ash and acidity.

This product provides a soft greasy film, which has a firmer texture and better protective properties than mineral jelly, but treated items require to be over-wrapped in a grease resistant paper after the film has been allowed to solidify.

**Uses:** Preservation of anti-friction bearings, machined surfaces, automotive, artillery and small arms sub-assemblies.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
8030-99-910-0494	12.5 kg	0475	++	34D

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## SECTION 4 : PX - CORROSION PREVENTIVES

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### NATO C-613

#### PX-13

CORROSION PREVENTIVE OIL, AIRCRAFT PISTON ENGINE:  
Static preservation, upper cylinder

**Specification:** DTD 791 C  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Microcrystalline petroleum wax, corrosion inhibitors, a dispersant additive and a tackiness additive in a mixture of mineral oil and petroleum spirit.

**Characteristics:** The specification includes tests for corrosion of steel, aluminium and copper, film stability, spraying properties, distillation, wax and water content and storage stability.

A thin soft wax remains when the solvent evaporates, the wax is present as a dispersant in the liquid phase and if it separates out on standing it is readily dispersed by shaking.

**Uses:** Preservation of aircraft engine cylinder bores, valves and springs.

**Note:** Not normally essential to remove this product prior to use of certain equipment but if in doubt consult the appropriate Service Authority. See page 5.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
8030-99-910-0497	25 litre	0475	--	34B

---

PSN: Petroleum Distillates NOS (Naphtha and Hexane Mixture)

UN No: 1268

UN Class: 3

Packaging Group: II

## SECTION 4 : PX - CORROSION PREVENTIVES

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### PX-15

CORROSION PREVENTIVE:  
Hard film, hot application

**Specification:** Def Stan 80-145/1

**Composition:** Plastic material, oil free.

**Characteristics:** The specification includes tests for appearance at 150°C, film forming properties and effect of impact.

A tough transparent plastic material of high melting point. It does not adhere to metal. Metal objects properly cleaned and completely enveloped in PX-15 will remain fully protected for several years.

**Uses:** Protection of components, tools, cutting edges from corrosion and mechanical damage.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
8030-99-910-7062	25 kg	0475	--	--

---

## SECTION 4 : PX - CORROSION PREVENTIVES

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### PX-19

CORROSION PREVENTIVE COMPOUND:  
Soft film, grease type

**Specification:** Def Stan 91-78/1.

**Composition:** A soft grease made from mineral oil and calcium soaps. Rust inhibitors and oxidation inhibitors may be included.

**Characteristics:** Penetration, worked ... .. 330-370  
Dropping point, min ... .. 90°C

The specification includes tests for acidity and alkalinity, oil separation, oxidation stability, protection of steel and low temperature properties.

**Uses:** Preservation of metal parts including artillery and small arms subassemblies, and on unwrapped heavy engineering and tool stores.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	<b>Navy</b>	Army	RAF
8030-99-220-2360	3 kg	0475	++	34D

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**  
Refer to appropriate product service authority, page 5.

## SECTION 4 : PX - CORROSION PREVENTIVES

---

### NATO C-634

#### PX-24

CORROSION PREVENTIVE: Water displacing

**Specification:** Def Stan 68-10/4.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Petroleum materials with corrosion inhibitors and surface active agents.

**Characteristics:** Flash point, closed cup, min ... .. 61°C

The specification includes tests for protection against corrosion, water displacing properties, freedom from corrosive effects, demulsification, film forming, lacquer forming tendency, copper corrosion under electric stress, electric strength, recovery of surface resistance and effect on non-metallic materials.

This product displaces water from surfaces and leaves a soft protective film.

**Uses:** Preservation and corrosive inhibition after operation of certain gas turbine engines and as a dewatering and protective fluid. This product is suitable for use on low voltage electrical equipment (up to 440V).

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-224-0649	25 litre	0473	--	--
6850-99-224-4966	5 litre	0475	++	34B
6850-99-224-5311	1 litre	--	++	--
8030-99-062-9759	500 ml Handspray	0475	--	--

---

NOTE: This product replaces PX-10 and PX-29.

PSN: Petroleum Distillate N.O.S. (contains White Spirit)  
UN No: 1268  
UN Class: 3  
Packaging Group: III



## SECTION 4 : PX - CORROSION PREVENTIVES

---

### NATO C-635

#### PX-26

CORROSION PREVENTIVE: Hydraulic system

- Specification:** Def Stan 80-142/1  
This product requires Product Conformity Certification.  
See page 5, Service Authority.
- Composition:** Hydraulic fluid OM-15 with technically acceptable corrosion inhibitors.
- Characteristics:**
- |                                  |                              |
|----------------------------------|------------------------------|
| Colour, Lovibond red ... ..      | 20-40 units                  |
| Viscosity at 40°C, min ... ..    | 13 mm <sup>2</sup> /s(cSt)   |
| Viscosity at -40°C, max ... ..   | 500 mm <sup>2</sup> /s(cSt)  |
| Viscosity at -54°C, max ... ..   | 3000 mm <sup>2</sup> /s(cSt) |
| Pour point, max ... ..           | -60°C                        |
| Flash point, closed cup, min ... | 81°C                         |

The specification includes tests for solid particle contamination, strong acid number, total acid number, copper corrosion, low temperature stability, sheer stability, wear scar diameter, evaporation loss, foaming characteristics, phosphorus content, corrosiveness and oxidation stability, corrosion prevention of steel and elastomer compatibility.

This product is similar to OM-15 and can be used as an emergency substitute, subject to technical advice.

**Uses:** Corrosion preventive oil for aircraft hydraulic systems in storage, radar equipment and rig testing of hydraulic components.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9150-99-700-8672	5 litre	--	--	34B
9150-99-763-8294	20 litre	--	++	--

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## SECTION 4 : PX - CORROSION PREVENTIVES

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### NATO C-615

#### PX-27

CORROSION PREVENTIVE OIL: Piston, metallic

**Specification:** Def Stan 91-40/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Mineral oil with a technically acceptable additive concentrate containing corrosion inhibitors and formulated to neutralize the corrosion effect of the products of combustion of leaded gasoline.

**Characteristics:** Viscosity at 100°C ... .. 17.5-21.9 mm<sup>2</sup>/s(cSt)  
Viscosity index, min ... .. 90  
Pour point, max ... .. -6°C  
Flash point, closed cup, min ... 170°C

The specification includes tests for corrosion protection of steel, other metals and alloys, carbon residue, sulfated ash and storage stability.

**Uses:** Corrosion preventive oil for aircraft piston engines which is circulated during final running on the test bed and for installed engines when an aircraft is being prepared for storage. Also preservation of certain helicopter gearboxes for storage.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9150-99-225-0849	25 litre	--	--	34B

## SECTION 4 : PX - CORROSION PREVENTIVES

---

### PX-28

CORROSION PREVENTIVE: Undersealing

**Specification:** Def Stan 80-143/1  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Petroleum based materials dispersed in hydrocarbon solvents.

Note: Halogenated solvents are excluded.

**Characteristics:** Flash point, closed cup, min ... .. 38°C  
Non volatile matter, percent, min ... 50

The specification includes tests for freedom from corrosive effects, water displacing properties and resistance to solvent vapour washing.

**Uses:** Preservation and corrosion inhibition of the interior surfaces of hollow sections of automotive and vehicle underbodies, certain artillery components bare metal and over certain paint systems.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
8030-99-657-7708	25 litre	--	++	34D

---

PSN: Flammable Liquid, N.O.S. (contains turpentine substitute)

UN No: 1993

UN Class: 3

Packaging Group: III



## SECTION 4 : PX - CORROSION PREVENTIVES

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### PX-31

CORROSION PREVENTIVE COMPOUND:  
Hard film, cold application

**Specification:** Def Stan 80-186/1

**Composition:** Bitumen with additives in a hydrocarbon solvent.

Note: Halogenated solvents are excluded.

**Characteristics:** Flash point, closed cup, min ... .. 38°C  
Surface drying time, minutes, max ... 45

The specification includes tests for film properties, total solids, viscosity, copper corrosion, film resistance to humidity, film flexibility, adhesion and stickiness.

**Uses:** Preservation of tools and automotive parts.

Note: This product is unsuitable for internal use in engines, subassemblies with moving parts and components with inaccessible recesses.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
8030-99-225-0860	5 litre	0475	++	34B
8030-99-225-0861	25 litre	--	++	34B

---

PSN: Flammable Liquid, N.O.S (contains Naphtha)

UN No: 1993

UN Class: 3

Packaging Group: III

## SECTION 4 : PX - CORROSION PREVENTIVES

---

### PX-32

#### CORROSION PREVENTIVE:

Aircraft structures, hard film, transparent, cold application

**Specification:** Def Stan 80-83/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** Unpigmented petroleum based materials dispersed in hydrocarbon solvents.

Note: Bitumen products and halogenated solvents are excluded.

**Characteristics:** Flash point, closed cup, min ... .. 32°C  
Viscosity at 25°C, min ... .. 1500 mPa.s(cP)

The specification includes tests for freedom from corrosive effects, film forming, sag, effect on polymethacrylate, transparency, flammability, adhesion, effect of impact, resistance to removal by aircraft exterior cleaner, resistance to anti-icing and de-icing fluids and resistance to weathering.

This product provides a light brown transparent film when the solvent evaporates.

**Uses:** Preservation and corrosion inhibition of structural members of airframes, interior surfaces of aircraft skins, components, bare metal and over certain paint systems.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
8030-99-225-3835	5 litre	0475	++	34B

---

PSN: Flammable Liquid, N.O.S. (contains turpentine substitute)

UN No: 1993

UN Class: 3

Packaging Group: III

## SECTION 4 : PX - CORROSION PREVENTIVES

---

### PX-36

CORROSION PREVENTIVE: Weapon cleaner, lubricant

**Specification:** Def Stan 91-103/2.

**Composition:** Mineral oil and/or synthetic hydrocarbon oil poly-alphaolefin (PAO), non-halogenated hydrocarbon solvent, corrosion and oxidation inhibitors.

**Characteristics:** Viscosity at 40°C, min ... .. 3.5 mm<sup>2</sup>/s  
Viscosity at -40°C, max ... .. 400 mm<sup>2</sup>/s  
Flash point, closed cup, min ... .. 61°C  
Pour point, max ... .. -50°C

The specification includes tests for water displacing properties, protection against corrosion, salt spray resistance, corrosion prevention, firing residue removal and elastomer compatibility.

This product has moderate lubrication properties.

**Uses:** The cleaning and preservation of the internal surfaces of barrels and breeches of ordnance of calibre over 20 mm.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
8030-99-051-9497	500 ml	0475	++	34D

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**SECTION 5 : AL-FLUIDS, WTA AND WHITE SPIRIT**

## SECTION 5 : AL - FLUIDS

---

### NATO S-745

#### AL-5

DE-ICING, DEFROSTING FLUID: Aircraft surfaces, in flight

**Specification:** DTD 406B.

**Composition:** Product, AL-20, percent volume ... 85  
Product, AL-11, percent volume ... 5  
Water, percent volume ... .. 10

**Characteristics:** Viscosity at 20°C ... .. 11-13 mm<sup>2</sup>/s(cSt)  
Specific gravity at 15.6°/15.6°C ... 1.092-1.097  
pH value ... .. 6.0-7.5

The specification includes tests for miscibility with water, conductivity and a cold test at minus 40°C.

This product is a clear colourless liquid.

**Uses:** De-icing or defrosting propellers, wing and tail systems equipped with porous distributors.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-910-0472	25 litre	--	--	34B
6850-99-220-5387	200 litre	--	--	34B

---



## SECTION 5 : AL - FLUIDS

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### NATO S-737

#### AL-11

#### ISOPROPANOL, TECHNICAL

**Specification:** BS 1595: Part 1, 1986.

**Composition:** Propan-2-ol (Isopropyl alcohol) for industrial use.

**Characteristics:** Density at 20°C ... .. 0.785–0.787 g/cm<sup>3</sup>  
Residue on evaporation,  
parts per million, max ... .. 20  
Flash point, closed cup, max ... .. 11°C

The specification includes tests for colour, distillation range, miscibility with water, water content, alkalinity, acidity, aldehydes and ketones content.

This product is a clear colourless liquid.

**Uses:** Deicing windscreens, corrosion inhibition procedure for certain gas turbines, diluted with water it is used as a compressor washing fluid during cold weather and prior to inhibition of the engine with PX-24.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6810-99-224-5628	25 litre	--	++	34B

---

PSN: Isopropanol  
UN No: 1219  
UN Class: 3  
Packaging Group: II



## SECTION 5 : AL - FLUIDS

---

### NATO S-747

#### AL-14

#### METHANOL, TECHNICAL

**Specification:** BS 506: Part 1, 1987.

**Composition:** Methanol (methyl alcohol) for industrial use.

**Characteristics:** Density at 20°C ... .. 0.791–0.794 g/cm<sup>3</sup>  
Residue on evaporation,  
parts per million, max ... .. 10 ppm

The specification includes tests for colour, distillation range, miscibility with water, alkalinity, acidity, aldehydes and ketones, sulfur and its compounds.

This product is a clear colourless liquid.

**Uses:** This product is also blended with high purity water to make AL-28 and AL-40.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6810-99-220-0988	25 litre	--	++	34B

---

PSN: Methanol

UN No: 1230

UN Class: 3, Subsidiary Risk 6.1

Packaging Group: II

## SECTION 5 : AL - FLUIDS

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### AL-20

#### ETHANEDIOL, TECHNICAL

**Specification:** Def Stan 68-108/2

**Composition:** Ethanediol.

**Characteristics:** Distillation:  
95 percent volume, recovery between... 194-199°C  
Density at 20°C ... .. 1.112-1.115 g/cm<sup>3</sup>

The specification includes tests for a cold test, ash content, acidity, chlorine and sulfate content.

This product is a clear colourless liquid.

**Uses:** Cooling systems of certain types of radar, when diluted with distilled or demineralized water and in certain transmitting equipment and marine gas turbines. The antifreeze is approved for use with AFFF fire extinguishers.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
6810-99-224-6027	25 litre	0473	++	34D



## SECTION 5 : AL - FLUIDS

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### AL-26

COOLANT FLUID, INHIBITED: Radio equipment

**Specification:** Def Stan 68-61/1.

**Composition:** Ethanediol, percent weight ... .. 61.5  
Water, percent weight ... .. 37.0  
Sodium benzoate, percent weight ... 1.5

The ethanediol conforms generally to Def Stan 68-108/2, AL-20, but the total chlorine content, expressed as sodium chloride (NaCl) is limited to not more than 33 parts per million.

**Characteristics:** Specific gravity at 15.6°/15.6°C ... .. 1.080-1.090  
pH ... .. 7.0-8.0  
Freezing point 50 percent  
solution in water, max ... .. -15°C  
Total chlorine content,  
calculated as NaCl, max ... .. 60 ppm  
Ionizable chlorine content,  
calculated as NaCl ... .. 5-20 ppm

This product is a clear colourless liquid.

**Uses:** Coolant in certain radio equipment.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
6850-99-224-7689	200 litre	--	--	34B

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

## SECTION 5 : AL - FLUIDS

---

### NATO S-1744

#### AL-28

METHANOL/WATER: 44/56

**Specification:** Def Stan 68-253/1, includes WTA.

**Composition:** AL-14, 43.8 parts + WTA, 56.2 parts (by volume)

**Characteristics:** Density at 15°C ... .. 0.941–0.945 g/cm<sup>3</sup>

The specification includes tests for acidity and total solids.

This product is a clear colourless liquid.

**Uses:** Thrust augmentation fluid in certain aircraft turbine engines.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
6850-99-220-2292	200 litre	--	--	34B

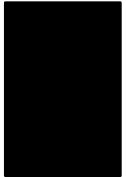
---

PSN: Methanol

UN No: 1230

UN Class: 3, Subsidiary risk 6.1

Packaging Group: II



## SECTION 5 : AL - FLUIDS

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### NATO S-1746

#### AL-34

DE-ICING, DEFROSTING FLUID: Aircraft surfaces, ground use

**Specification:** DTD 900/4907, Kilfrost Anti-Icing Barrier Compound (AFS 663).

**Characteristics:** Thixotropic fluid.

**Uses:** Anti-icing barrier compound providing protection for aircraft and certain missiles on the ground and for defrosting of turn around aircraft.

**WARNING:** This product shall not be used in aircraft de-icing systems under any circumstances.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-766-3796	25 litre	--	++	--
6850-99-220-3463	200 litre	--	--	34B
6850-99-220-3464	Bulk	--	--	34B

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## SECTION 5 : AL - FLUIDS

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### AL-36

WINDSCREEN WASHING FLUID: Aircraft

**Specification:** DTD 900/4939B, (AFS 959B) Kilfrost WWF/Mod 3

**Characteristics:** Clear colourless liquid of low freezing point.

**Uses:** Windscreen washing fluid in certain aircraft.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-224-9463	500 ml	0473	--	--
6850-99-224-5397	25 litre	--	++	34B

---



## SECTION 5 : AL - FLUIDS

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### NATO S-757

#### AL-39

##### ANTIFREEZE, INHIBITED ETHANEDIOL

**Specification:** Def Stan 68-127/1.

**Composition:** Ethanediol and water, inhibited with sodium sebacate and benzotriazole.

**Characteristics:** Colour ... .. Blue  
Flash point, open cup, min ... .. 110°C  
Freezing point, 25 percent volume  
aqueous solution, max ... .. -10°C  
Water content, percent, max ... .. 5.0  
Sodium sebacate content ... .. 4.0-4.5% m/m  
Benzotriazole content... .. 0.25-0.30% m/m

The specification includes tests for density, boiling point and pH value.

**Uses:** Antifreeze in the cooling systems of marine and land service IC engines containing both ferrous and non ferrous components.

The product shall be diluted with an equal volume of water, before use.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-641-8053	5 litre	--	++	34D
6850-99-225-0424	25 litre	0473	++	34D
6850-99-225-0425	200 litre	--	++	34D
6850-99-818-0087	Bulk	--	++	--

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## SECTION 5 : AL - FLUIDS

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### AL-40

METHANOL/WATER: Hydrogen Generators

**Specification:** Def Stan 68-129/1.

**Composition:** Nine parts by volume of product AL-14 to 4 parts of distilled or deionized water.

**Characteristics:** Density at 15°C ... .. 0.886-0.890 g/cm<sup>3</sup>

This product is a clear colourless liquid.

**Uses:** For use in catalytic generators providing hydrogen for balloon filling.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
6810-99-513-3295	25 litre	--	++	34D

---

PSN: Methanol

UN No: 1230

UN Class: 3, Subsidiary Risk 6.1

Packaging Group: II



## SECTION 5 : AL - FLUIDS

---

### NATO S-1745

#### AL-41

FUEL SYSTEM ICING INHIBITOR: High flash type

**Specification:** Def Stan 68-252/2.

**Composition:** Diethylene glycol monomethyl ether.

**Characteristics:** Density at 15°C ... .. 1.024–1.028 kg/l  
Flash point, closed cup, min ... .. 65°C

The specification includes tests for acidity, colour, distillation range, ethylene glycol and water content.

When aviation fuel containing this product becomes contaminated with free water the AL-41 migrates from the fuel to the water where it acts as a freezing point depressant.

**Uses:** Aviation fuel system icing inhibitor (FSII) added to aviation turbine fuels.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220

#### **WARNING.**

#### **Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-225-1930	5 litre	0721	--	--
6850-99-225-1929	25 litre	0721	--	--
6850-99-300-6950	205 litre	--	--	34B
6850-99-234-3270	Bulk	--	--	34B

---

## SECTION 5 : AL - FLUIDS

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### AL-48\*

#### MIXTURE OF FUEL SYSTEM ICING INHIBITOR AL-41 AND LUBRICITY IMPROVING ADDITIVE AL-61

**Specification:** Def Stan 68-150/1.

**Composition:** A homogeneous mixture of AL-41 and AL-61. The concentrations to be used are listed in Def Stan 68-150.

**Characteristics:** Density at 15°C ... .. 1.020-1.028 g/cm<sup>3</sup>

The specification includes a test for Total Acid Number. This product is a clear colourless liquid.

**Uses:** This mixture allows two additives to be injected into aviation fuels in a single operation. It should not be used where there are facilities for separate injection, which is the recommended method of injection of FSII and lubricity improving additives for the preparation of AVTUR/FSII F-34, AVTAG/FSII F-40 and AVCAT/FSII F-44.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-549-2707	25 litre	--	--	34B
6850-99-000-6760	200 litre	--	--	34B
6850-99-304-1578	Bulk	--	--	34B

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\*Note: Joint Service Designation AL-48 is followed by a type number to indicate the corrosion inhibitor used.

## SECTION 5 : AL - FLUIDS

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### NATO S-1747

#### AL-61

#### LUBRICITY IMPROVING ADDITIVE FOR AVIATION TURBINE FUELS

**Specification:** Def Stan 68–251/2.  
This product requires Product Conformity Certification.  
See page 5, Service Authority.

**Composition:** A mixture of fatty acids.

**Characteristics:** Each additive must meet the requirements for Minimum Effective Concentration and Lubricity Improving Potential. In addition, quality control characteristics for each product approved to this specification are listed in the Def Stan 69–251 TAPL. This includes tests for ash, density, flash point, kinematic viscosity, pour point, microseparometer rating and total acid number.

Concentration limits, applicable when the product is used as an Aviation Fuel Lubricity Improving Additive as a fuel specification requirement, are also given.

**Uses:** As a lubricity improver for aviation gas turbine engine fuels.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
6850-99-663-3466	500 ml	--	--	34B
6850-99-224-5252	200 litre	--	--	34B

---

PSN: Environmentally Hazardous Substance Liquid NOS (contains Naphthalene)  
UN No: 3082  
UN Class: 9  
Packaging Group: III

## SECTION 5 : WTA

---

### NATO S-1739

#### WTA

WATER, THRUST AUGMENTATION: Demineralized

**Specification:** Def Stan 68-253/1, includes AL-28.

**Characteristics:** Dissolved solids, max ... .. 10 mg/litre  
pH value... .. 5.0-7.5  
or  
Electrical conductivity at  
20 ± 5°C, max ... .. 1100 µs/m  
Silica content, max ... .. 3 mg SiO<sub>2</sub>/litre

This product is a clear colourless liquid free from solid matter.

**Uses:** Thrust augmentation fluid in the Pegasus engine of the Harrier aircraft and an ingredient of AL-28.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220 **WARNING**.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
6810-99-220-3461	200 litre	--	++	34B

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## SECTION 5 : WHITE SPIRIT

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### NATO S-752

### WHITE SPIRIT

**Specification:** BS 245: 1976, TYPE A.

**Composition:** Hydrocarbons

**Characteristics:** Distillation, solvent recovered:  
Recovery at 145°C, max ... .. 10% v/v  
Recovery at 200°C, min ... .. 90% v/v  
Final boiling point, max ... .. 220°C  
Aromatic content, max... .. 25% v/v  
Flash point, closed cup, min ... .. 32°C

The specification includes tests for suspended matter, free water, colour residue on evaporation, neutrality and corrosive sulfur.

**Uses:** General purpose cleaner, thinners for certain paints and removal of certain temporary protectives.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
8010-99-942-7564	25 litre	0442	++	34D
8010-99-942-9258	200 litre	--	--	34D
8010-99-220-1815	Bulk	0442	--	--

---

PSN: Turpentine Substitute

UN No: 1300

UN Class: 3

Packaging Group: III

**SECTION 6A : FUELS  
AVIATION GASOLINES**

**SECTION 6A : AVIATION GASOLINES**

---

**AVGAS-100LL**

GASOLINE, AVIATION: Grade 100/130

**Specification:** Def Stan 91-90/1, includes other grades

**Composition:** Hydrocarbons with technically acceptable additives.

**Characteristics:** Colour ... .. Blue  
 Distillation, fuel evaporation:  
 10 percent, max ... .. 75°C  
 40 percent, min ... .. 75°C  
 50 percent, max ... .. 105°C  
 90 percent, max ... .. 135°C  
 End point, max ... .. 170°C  
 Freezing point, max ... .. -60°C  
 Knock rating:  
 Lean mixture, motor method,  
 Octane number, min ... .. 99.5  
 Rich mixture, octane number, min ... .. 130  
 Reid vapour pressure at 37.8°C ... .. 38.0–49.0 kPa  
 Sulfur total, percent mass, max ... .. 0.05  
 Tetraethyl lead content, max ... .. 0.56 gPb/l  
 Specific energy, min ... .. 43.5 MJ/kg

The specification includes tests for specific energy, copper corrosion, existent gum, oxidation stability and water reaction.

**Uses:** In aircraft piston engines.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
—	200 litre	—	++	—
9130-99-910-0444	Bulk	0722	++	34A

PSN: Petrol  
 UN No: 1203  
 UN Class: 3  
 Packaging Group: II



**SECTION 6B : FUELS  
AVIATION TURBINE FUELS**

## SECTION 6B : AVIATION TURBINE FUELS

### NATO F-40

### AVTAG-FSII

TURBINE FUEL, AVIATION: Wide cut type with FSII

**Specification:** Def Stan 91-88/1.\*

**Composition:** Hydrocarbons with AL-41 and AL-61 as mandatory additives: these additives may be added to the fuel as an admixture AL-48.

**Characteristics:** Aromatics, max ... .. 25.0 % v/v  
Sulfur total, max ... .. 0.30 % m/m  
Distillation, fuel recovered:  
20 percent volume, min ... .. 100°C  
50 percent volume, min ... .. 125°C  
End point, max ... .. 270°C  
Reid vapour pressure at 37.8°C ... .. 14-21 kPa  
Density at 15°C ... .. 751-802 kg/m<sup>3</sup>  
Freezing point, max ... .. -58°C  
Specific energy, min ... .. 42.8 MJ/kg  
The specification includes tests for acidity, mercaptan sulfur, hydrogen content, specific energy, smoke point, copper corrosion, thermal stability, existent gum, water reaction, water separation (MSEP) and electrical conductivity.

Small amounts of free water in the fuel are prevented from freezing by the presence of 0.10-0.15 percent volume of AL-41. The AL-61 improves the lubricity of the fuel.

**Uses:** Aircraft turbine engines.

**WARNING:** Not acceptable for use or embarkation in HM ships. The vapour pressure of this fuel is such that it forms explosive mixtures with air over a very wide range of temperatures and concentrations.

**Standardized Alternatives:** See Table 1.

Note: This fuel is not normally available in UK or NATO Europe. In UK the specification is being retained because it is required for aero engine certification. The NATO availability of this fuel is presently restricted to Canada. The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents.  
See page 220 **WARNING**.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9130-99-220-1037	Bulk	--	++	34A

\* Note: This standard implements STANAG 3747.  
No transport information available. Highly flammable.

**SECTION 6B : AVIATION TURBINE FUELS**

---

**NATO F-44**

**AVCAT-FSII**

TURBINE FUEL, AVIATION: High flash type with FSII

**Specification:** Def Stan 91-86/2.\*

**Composition:** Hydrocarbons with AL-41 and AL-61 as mandatory additives: these additives may be added to the fuel as an admixture AL-48.

**Characteristics:**

Aromatics, max ... ..	22.0 % v/v
Sulfur, total, max ... ..	0.30 % m/m
Distillation, fuel recovered:	
10 percent volume, max... ..	205°C
End point, max ... ..	300°C
Flash point, closed cup, min ... ..	61°C
Density at 15°C... ..	788-845 kg/m <sup>3</sup>
Freezing point, max... ..	-46°C
Viscosity at -20°C, max... ..	8.8 mm <sup>2</sup> /s(cSt)
Specific energy, min... ..	42.6 MJ/kg

The specification includes tests for acidity, olefins, mercaptan sulfur, hydrogen content, specified energy, smoke point, copper corrosion, silver corrosion, thermal stability, copper content, existent gum, water reaction and water separation index, modified.

Small amounts of free water in the fuel are prevented from freezing by the presence of 0.12-0.15 percent volume of AL-41. The AL-61 improves the lubricity of the fuel.

**Uses:** Turbine engines of shipborne aircraft, emergency use in ships' main and auxiliary engines in lieu of DIESO.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220 **WARNING**.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9130-99-224-9717	200 litre	0722	--	--
9130-99-220-2148	Bulk	0722	--	--

---

\* Note: This product implements STANAG 3747.

PSN: Kerosene  
 UN No:  
 UN: Class 3  
 Packaging Group: III

## SECTION 6B : AVIATION TURBINE FUELS

---

### NATO S-746

#### AVPIN

#### ISOPROPYL NITRATE

**Specification:** Def Stan 91-89/1.

**Composition:** Isopropyl nitrate only.

**Characteristics:** Density at 20°C ... .. 1041-1047 kg/m<sup>3</sup>  
Acidity, total, as nitric acid, max ... .. 100 mg/l  
Nitrite, as nitrous acid, max ... .. 25 mg/l  
Water, max ... .. 1200 mg/l

The specification includes tests for chlorides, sulfates, residue on evaporation and colour.

**Uses:** Starter fuel for certain aircraft turbine engines.

**Standardized Alternatives:** See Table 1.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9135-99-224-0654	20 litre	--	--	34B
9135-99-942-3147	200 litre	--	--	34B

---

PSN: Isopropyl nitrate

UN No: 1222

UN Class: 3

Packaging Group: II

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

## SECTION 6B : AVIATION TURBINE FUELS

---

### NATO F-35

#### AVTUR

TURBINE FUEL, AVIATION: Kerosene type

**Specification:** Def Stan 91-91/3.\*

**Composition:** Hydrocarbons with technically acceptable additives.

**Characteristics:**

Aromatics, max	... ..	25.0 % v/v
Sulfur total, max	... ..	0.30 % m/m
Distillation, fuel recovered:		
10 percent volume, max	... ..	205°C
End point, max	... ..	300°C
Flash point, closed cup, min	... ..	38°C
Density at 15°C	... ..	775-840 kg/m <sup>3</sup>
Freezing point, max	... ..	-47°C
Viscosity at -20°C, max	... ..	8.0 mm <sup>2</sup> /s(cSt)
Specific energy, min	... ..	42.8 MJ/kg

The specification includes tests for acidity, lubricity, mercaptan sulfur, specific energy, smoke point, naphthalenes, thermal stability, existent gum, water reaction, water separation index, modified, and electrical conductivity.

**Uses:** Aircraft turbine engines, and the basis of AVTUR/FSII to Def Stan 91-87/2.

**WARNING:** Not acceptable for use or embarkation in HM Ships.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220 **WARNING**.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	<b>RAF</b>
9130-99-943-1771	Bulk	0722	--	34A

---

\* Note: This product implements STANAG 3747.

PSN: Kerosene

UN No:

UN Class: 3

Packaging Group: III

## SECTION 6B : AVIATION TURBINE FUELS

---

### NATO F-34

### AVTUR-FSII

TURBINE FUEL, AVIATION: Kerosene type with FSII

**Specification:** Def Stan 91-87/2.\*

**Composition:** Hydrocarbons with AL-41 and AL-61 as mandatory additives: these additives may be added to the fuel as an admixture AL-48.

**Characteristics:** As AVTUR F-35 except that small amounts of free water in the fuel are prevented from freezing by the presence of 0.10-0.15 percent volume of AL-41. The AL-61 improves the lubricity of the fuel.

**Uses:** Aircraft turbine engines and compression ignition engines (single fuel concept).

**WARNING:** Not acceptable for use or embarkation in HM Ships.

**Standardized Alternatives:** See Table 1.

Note: The listing of alternatives in Table 1 is a guide only and reference must be made to the Aircraft's Documents. See page 220

**WARNING.**

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9130-99-330-1276	200 litre	--	++	34A
9130-99-220-1036	Bulk	0722	++	34A

---

\*Note: This product implements STANAG 3747.

PSN: Kerosene

UN No:

UN Class: 3

Packaging Group: III

**SECTION 6C : FUELS  
AUTOMOTIVE GASOLINES**

## SECTION 6C : AUTOMOTIVE GASOLINES

---

### F-57

### MTGAS

GASOLINE, AUTOMOTIVE: LEAD REPLACEMENT

**Specification:** Proprietary.

**Composition:** Hydrocarbons together with exhaust valve seat protection additive and other additives as required.

**Characteristics:** Research Octane Number RON, min ... .. 95  
Specific energy, typical ... .. 42.5 MJ/kg  
Reid vapour pressure at 37.8°C,  
including seasonal variation ... .. 45-115 kPa

**Uses:** Spark ignition engines for military use, where leaded fuel is required.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9130-99-921-6841	20 litre	--	++	34C
9130-99-577-5825	Bulk	0723	++	34C

---

\* Note: This product implements STANAG 7090.

PSN: Petrol

UN No: 1203

UN Class: 3

Packaging Group: II



## SECTION 6C : AUTOMOTIVE GASOLINES

---

### NATO F-67

#### ULGAS

GASOLINE, AUTOMOTIVE: UNLEADED

**Specification:** BS EN 228: 2000

**Composition:** Volatile hydrocarbons together with additives as required.

**Characteristics:**

Lead content, max	... ..	5 mg/l
Motor Octane number MON, min	... ..	85
Research Octane number RON, min	... ..	95
Specific energy, typical	... ..	42.5 MJ/kg
Reid vapour pressure at 37.8°C, including seasonal variation	... ..	35-100 kPa

**Uses:** Spark ignition engines for ground use.

**WARNING:** Not to be used in engines requiring leaded gasoline.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9130-99-300-6864	20 litre	0723	++	34C
9130-99-956-6833	Bulk	0723	++	34C

-

In Europe the local National guide specification, which interprets EN 228 will be used.

\* Note: This product implements STANAG 7090.

PSN: Petrol

UN No: 1203

UN Class: 3

Packaging Group: II



**SECTION 6C : AUTOMOTIVE GASOLINES**

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**SECTION 6D : FUELS  
DIESELS**

## SECTION 6D : DIESEL FUELS

---

### NATO F-54

#### DIESO MILITARY

##### DIESEL FUEL, MILITARY

**Specification:** BS EN 590: 2000.

**Composition:** Hydrocarbons and corrosion inhibitors, technically acceptable cetane number improvers may be included.

**Characteristics:** As DIESO MT

**Uses:** Compression ignition engines, in Central Europe, operated over the ambient temperature range of not lower than minus 15°C.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9140-99-370-8580	20 litre	--	++	34C
9140-99-670-3548	Bulk	--	++	34C

---

\* Note: This product implements STANAG 7090.

PSN: Diesel Fuel

UN No: 1202

UN Class: 3

Packaging Group: III

## SECTION 6D : DIESEL FUELS

---

### DIESO UK

#### DIESEL FUEL, GENERAL PURPOSE

**Specification:** BS2869: 1998, Class A2, includes other grades and products.

**Composition:** Hydrocarbons and corrosion inhibitors, technically acceptable cetane number improvers may be included.

**Characteristics:**

Colour	... ..	Red
Density, min	... ..	820 kg/m <sup>3</sup>
Distillation, fuel recovered		
Recovery at 250°C, max	... ..	65% v/v
Recovery at 350°C, min	... ..	85% v/v
Flash point, closed cup, min	... ..	56°C
Viscosity at 40°C		
Summer, March to September		
inclusive	... ..	2.0-5.5 mm <sup>2</sup> /s(cSt)
Winter October to February		
inclusive	... ..	1.5-5.5 mm <sup>2</sup> /s(cSt)
Sulfur content, max	... ..	0.20% m/m
Cetane number, min	... ..	45
Ash content, max	... ..	0.01% m/m
Cold filter plugging point		
Summer, March to September		
inclusive, max	... ..	-4°C
Winter, October to February		
inclusive, max	... ..	-12°C

The specification includes tests for copper corrosion, carbon residue, sediment, strong acid number and water content.

**Uses:** Compression ignition engines, other than motor transport on public roads.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	NAVY	Army	RAF
9140-99-005-0243	20 litre	--	++	--
9140-99-495-7241	200 litre	--	++	--
9140-99-224-9638	Bulk	--	++	34C

PSN: Diesel Fuel  
 UN No: 1202  
 UN Class: 3  
 Packaging Group: III



## SECTION 6D : DIESEL FUELS

---

### DIESO MT

DIESEL FUEL, GENERAL PURPOSE MT

**Specification:** BS EN 590: 2000

**Composition:** Hydrocarbons and corrosion inhibitors, technically acceptable cetane number improvers may be included.

**Characteristics:** Distillation, fuel recovered:  
Recovery at 350°C, min ... .. 85% v/v  
Flash point, closed cup, min ... .. above 55°C  
Viscosity at 40°C ... .. 2.0-4.5 mm<sup>2</sup>/s(cSt)  
Sulfur content, max ... .. 0.035% m/m  
Cetane number, min ... .. 51  
Ash content, max ... .. 0.01% m/m  
Cold filter plugging point  
Summer, max ... .. -5°C  
Winter, max ... .. -15°C

The specification includes tests for copper corrosion, carbon residue, oxidation stability, lubricity, contamination, polycyclic aromatic hydrocarbons and water content.

**Uses:** Compression ignition engines, for motor transport on public roads.

Note: Ultra low sulfur diesel (ULSD) complying with BS EN 590 and the following government specification is preferred for MOD use.

- The sulfur content of which does not exceed 0.005% by weight or is nil;
- the density of which does not exceed 835 kilograms per cubic metre at a temperature of 15°C; and
- of which not less than 95% by volume distills at a temperature not exceeding 345°C.

This product is preferred for MOD use.

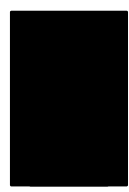
**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9140-99-910-5052	20 litre	--	++	--
9140-99-875-6672	200 litre	--	++	--
9140-99-910-0459	Bulk	0723	++	34C

---

PSN: Diesel Fuel  
UN No: 1202  
UN Class: 3  
Packaging Group: III



## SECTION 6D : DIESEL FUELS

---

### NATO F-76

### DIESO F-76

#### FUEL NAVAL DISTILLATE

**Specification:** Def Stan 91-4/6\*

**Composition:** Petroleum distillates, technically acceptable cetane number improvers may be included.

**Characteristics:** Density at 15°C ... .. 0.820-0.880 kg/l  
Distillation, fuel recovered:  
Recovery at 350°C, min ... .. 85% v/v  
Flash point, closed cup, min ... .. 61°C  
Viscosity at 40°C ... .. 1.7-4.3 mm<sup>2</sup>/s(cSt)  
Cloud point, max ... .. -1°C  
Pour point, max ... .. -6°C  
Sulfur content, max ... .. 1.0% m/m  
Cetane number, min ... .. 45

The specification includes tests for colour, pour point, ash content, copper corrosion, acidity, carbon residue, filter blocking, storage stability and water reaction.

**Uses:** Compression ignition engines of the high and medium speed types, Naval gas turbines, steam raising plant in certain HM ships.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9140-99-942-3220	Bulk	0721	--	--

---

\* Note: This product implements STANAG 1385.

PSN: Diesel Fuel  
UN No: 1202  
UN Class: 3  
Packaging Group: III

**SECTION 6D : DIESEL FUELS**

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**SECTION 6E : FUELS  
FURNACE FUEL OILS,**

## SECTION 6E : FURNACE FUEL OILS

---

### 3/50 FFO

FUEL, MIDDLE DISTILLATE: Class D

**Specification:** BS 2869: 1998 Class D includes other grades and products.

**Composition:** Hydrocarbons.

**Characteristics:** Distillation, fuel recovered  
Recovery at 250°C, max ... .. 65% v/v  
Recovery at 350°C, min ... .. 85% v/v  
Flash point, closed cup, min ... .. 56°C  
Viscosity at 40°C ... .. 1.5–5.5 mm<sup>2</sup>/s(cSt)  
Sulfur content, max ... .. 0.2% m/m  
Ash content, max ... .. 0.01% m/m  
Cold filter plugging point:  
Summer, March to September  
inclusive, max... .. -4°C  
Winter, October to February  
inclusive, max... .. -12°C

The specification includes tests for carbon residue, copper corrosion, sediment, strong acid number and water content.

**Uses:** Automatic burners for heating.

This product requires no preheating in storage or in use in temperate climates.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9140-99-943-3330	Bulk	--	++	34C

---

PSN: Gas Oil

UN No: 1202

UN Class: 3

Packaging Group: III

## SECTION 6E : FURNACE FUEL OILS

---

### 36/50 FFO

FUEL, RESIDUAL: Burner, Class E

**Specification:** BS 2869: 1998 Class E, includes other grades and products.

**Composition:** Hydrocarbons.

**Characteristics:** Viscosity at 100°C, max ... .. 8.2 mm<sup>2</sup>/s(cSt)  
Flash point, closed cup, min ... .. 66°C  
Sulfur content, max ... .. 3.5% m/m  
Ash content, max ... .. 0.10% m/m

The specification includes tests for carbon residue, sediment, strong acid number and water content.

**Uses:** For boiler furnaces. This fuel may require preheating in temperate climates.

**Standardized Alternatives:** None

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9140-99-910-0464	Bulk	--	++	--

---

PSN: Gas Oil  
UN No: 1202  
UN Class: 3  
Packaging Group: III

**THIS PRODUCT SHOULD NOT BE USED IN NEW APPLICATIONS OR DESIGNS.**

Refer to appropriate service authority, page 5.

## SECTION 6E : FURNACE FUEL OILS

---

### 125/50 FFO

FUEL, RESIDUAL: Burner, Class F

**Specification:** BS 2869: 1998 Class F, includes other grades and products.

**Composition:** Hydrocarbons.

**Characteristics:** Flash point, closed cup, min ... .. 66°C  
Viscosity at 100°C, max ... .. 20mm<sup>2</sup>/s (cSt)  
Sulfur content, max ... .. 3.5% m/m  
Ash content, max ... .. 0.10% m/m

The specification includes tests for carbon residue, sediment, strong acid number and water content.

**Uses:** Boiler furnaces.

This fuel requires preheating in temperate climates.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
9140-99-942-5615	Bulk	--	++	34C

---

PSN: Gas Oil

UN No: 1202

UN Class: 3

Packaging Group: III

## SECTION 6E : FURNACE FUEL OILS

---

### 370/50 FFO

FUEL, RESIDUAL: Burner, Class G

**Specification:** BS 2869: 1998, Class G, includes other grades and products.

**Composition:** Hydrocarbons.

**Characteristics:** Flash point, closed cup, min ... .. 66°C  
Viscosity at 100°C, max ... .. 40 mm<sup>2</sup>/s(cSt)  
Sulfur content, max ... .. 3.5% m/m  
Ash content, max ... .. 0.15% m/m

The specification includes tests for carbon residue, sediment, strong acid number and water content.

**Uses:** Boiler furnaces and RN non marine use.

This fuel requires preheating in temperate climates.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9140-99-942-6256	Bulk	--	++	--

---

PSN: Gas Oil

UN No: 1202

UN Class: 3

Packaging Group: III



**SECTION 6E : FURNACE FUEL OILS**

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**SECTION 6F : FUELS  
HEATING AND LIGHTING**

## SECTION 6F : HEATING AND LIGHTING FUELS

---

### KERO/A

KEROSENE: Flueless burner, Class C1

**Specification:** BS 2869: 1998 Class C1, includes other grades.

**Composition:** Hydrocarbons.

**Characteristics:** Distillation, fuel recovered:  
Recovery at 200°C ... .. 15–60% v/v  
Final boiling point, max ... .. 280°C  
Flash point, closed cup, min ... .. 43°C  
Smoke point, min ... .. 34 mm  
Sulfur content, max ... .. 0.04%/m

The specification includes tests for colour, char value and copper corrosion.

**Uses:** For heating and lighting, particularly for flueless wick fed burners operating indoors. Not for IC engines.

**Standardized Alternatives:** None.

**Stores Numbers:**

NATO Stock No	Nominal Size	Navy	Army	RAF
9140-99-943-9602	20 litre	--	++	--
9140-99-943-9591	200 litre	--	++	--
9140-99-910-5053	Bulk	0475	++	34C

---

PSN: Kerosene

UN No: 1223

UN Class: 3

Packaging Group: III



## SECTION 6F : HEATING AND LIGHTING FUELS

---

### NATO F-58

### KERO/B

### KEROSENE

**Specification:** BS 2869: 1998 Class C2, includes other grades and products.\*

**Composition:** Hydrocarbons.

**Characteristics:** Distillation, fuel recovered:

Recovery at 200°C, min	...	...	...	15% v/v
Final boiling point, max	...	...	...	300°C
Flash point, closed cup, min	...	...	...	38°C
Viscosity at 40°C	...	...	...	1.0–2.0 mm <sup>2</sup> /s(cSt)
Sulfur content, max	...	...	...	0.20% m/m
Smoke point, min	...	...	...	19 mm

The specification includes tests for colour, char value and copper corrosion.

**Uses:** Heating, lighting and cleaning.

**Note:** Not to be used in flueless wick fed burners.

**Standardized Alternatives:** See Table 1.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	Army	RAF
9140-99-460-6730	20 litre	--	++	--
9140-99-573-1014	200 litre	--	++	--
9140-99-910-5054	Bulk	0475	++	34C

---

\* Note: This product implements STANAG 7090.

PSN: Kerosene

UN No: 1223

UN Class: 3

Packaging Group: III



## SECTION 6F : HEATING AND LIGHTING FUELS

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### STOVE NAPHTHA

#### NAPHTHA FOR COOKING STOVES

**Specification:** Proprietary.

**Composition:** Hydrocarbons and an anti-oxidant may be included.

**Characteristics:** Distillation, fuel recovered:

Initial boiling point	...	...	...	...	30-40°C
10 percent volume	...	...	...	...	60-80°C
50 percent volume	...	...	...	...	90-110°C
Final boiling point, max	...	...	...	...	200°C
Sulfur content, max	...	...	...	...	0.05% m/m
Vapour pressure, max...	...	...	...	...	60 kPa

The specification includes tests for Reid vapour pressure, aromatics content, benzene content, lead content, existent gum, oxidation stability and copper corrosion.

**Uses:** Fuel for cooking stoves and lanterns.

**Note:** Not to be used in equipment designed to operate on kerosene.

**Standardized Alternatives:** None.

#### Stores Numbers:

NATO Stock No	Nominal Size	Navy	<b>Army</b>	RAF
6810-99-137-2959	20 litre	0475	++	--

---

PSN: Petroleum Distillates, N.O.S. (contains Hexane)

UN No: 1268

UN Class: 3

Packaging Group: II

## SECTION 7 : REFERENCE FUELS

## **SECTION 7 : REFERENCE FUELS**

---

### **REFERENCE FUELS**

Def Stan 91/7 has been withdrawn and is replaced (when used for technical acceptance testing and development work on MOD compression ignition and turbine engines and testing of oils in Petter AV-B tests) by EN 590 for the testing for Land and by F-76 for Naval applications.

Reference diesel fuel, low temperature has been withdrawn and, where required, AVTUR to Def Stan 91-91/3 with a minimum cetane number of 40 is recommended for technical acceptance testing and development work on MOD compression ignition and turbine engines.

Reference diesel fuel 47 cetane has been withdrawn without replacement.

Gasoline low lead to Def Stan 91-7/3 can be substituted by BS4040 4 star or EN 228, dependent on the application.

**SECTION 7 : REFERENCE FUELS**

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## **NATO STANDARDIZED FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS**

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**TABLE 1** implements NATO STANAG 1135, Annex C and ASCC Air Std 15/9. These documents are reviewed periodically and identify the degree of interchangeability between the agreed products of NATO countries, Australia and New Zealand. Only products that are fully standardized may be interchanged under the NATO code.

**TABLE 1** lists national specifications which have been agreed by the appropriate Working Parties as being similar and interchangeable after study and comparison with the guide specification where applicable. The number in brackets placed beside the NATO Code Number indicates the STANAG's number agreed as the guide specification. The symbol (+) is placed beside a national specification when this is the agreed guide specification.

Services using a product are identified as follows:

Navy	– n or N	)	A capital letter indicates
Army	– a or A	)	the Service responsible
Air Force	– af or AF	)	for the specifications.

If the Service responsible for the specification does not use the product the identifying capital letter will be shown in brackets, eg (A).

**Standardized Product:** A product that conforms to specifications resulting from the same or equivalent technical requirements. The standardized fuels, lubricants and associated products are identified by a NATO Code.

**Acceptable Product:** One which may be used in place of another product for extended periods without technical advice.

**Emergency Substitute:** A product which may only be used in an emergency on the advice of technically qualified personnel of the sponsor Service, who will specify the limitations.

**WARNING:** A listing under Acceptable Product and Emergency Substitute may not necessarily apply to aircraft useage. The use of fuels and lubricants in aircraft engine types is authorized by Controller of Aircraft Release to Service documents. Information as to the types of fuels and lubricants that may be used, including emergency use, is also shown in the aircraft's Servicing Manual and Pilot's Notes, together with relevant engineering safeguards. Air publication (AP) 100E-05 also refers.

NATO Codes are allocated to NATO Standardized Products by the Military Agency for Standardization, NATO. They consist of an index letter followed by a number, eg O-134.

The NATO Code is enclosed in a rectangle when applied as an identification for marking on containers, dispensing equipment and installation.

## ABBREVIATIONS

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ASCC Air Standardization Co-ordinating Committee

NATO	North Atlantic Treaty Organization	S	Speciality Products
F	Fuels	JSD	Joint Service Designations
O	Oils	AP	Acceptable Products
G	Greases	ES	Emergency Substitutes
H	Hydraulic Fluids	R	Remarks
C	Corrosion Preventives	Q	Product is subject to Qualification Testing
AS	Australia *	BE	Belgium
CZ	Czech Republic	DA	Denmark
GE	Germany	GR	Greece
IT	Italy	LU	Luxembourg
NO	Norway	PL	Poland
PO	Portugal	SP	Spain
US	United States	TU	Turkey
CA	Canada	FR	France
HU	Hungary	NL	Netherlands
NZ	New Zealand *	UK	United Kingdom

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\* Note: Australia and New Zealand are non-NATO nations.

Footnote: It has been agreed by the authorities concerned that propellant fuels shall not be detailed in Table 1.

**TABLE 1 – NATO Standardized Products**

<b>NATO Code</b>		<b>F-18</b> GASOLINE, AVIATION: Grade 100/130	<b>F-34 (3747)</b> TURBINE FUEL, AVIATION: Kerosene type with S-1745	<b>F-35 (3747)</b> TURBINE FUEL, AVIATION: Kerosene type
AS			DEF (AUST) 5240 C Amd 1 a/af	Def Stan 91-91/3 (DERD 2494) n/a/af
BE	BA-PF-5* Iss E a/AF		BA-PF-7C a/AF	BA-PF-7C* a/AF
CA			CAN/CGSB-3.23 Iss 00 (F-34)** AF	CAN/CGSB 3.23 Iss 00** AF
CZ				
DA			Def Stan 91-87/2 n/a/AF	Def Stan 91-91/2 (DERD 2494)** AF
FR	DCSEA 118/A (+) n/a/AF		DCSEA 134/A n/a/AF	DCSEA 134/A** AF
GE			TI 9130 - 0012 Iss 4 n/a/AF	Def Stan 91-91/3 n/AF
GR			MIL-T-83133D Amd 1 n/a/AF	MIL-T-83133D Amd 1 n/a/AF
HU				
IT			AER-M-C.141e F-34 a/AF	AER-M-C.141e F-35* a/AF
LU				
NL			Def Stan 91-87/1 Amd 1 a/AF	Def Stan 91-91/2 (DERD 2494) n/(AF)
NO			MIL-T-83133D Amd 1 a/AF	
NZ			DEF (AUST) 5240 C Amd 1 AF	Def Stan 91-91/3 (DERD 2494) AF
PL				
PO			Def Stan 91-87/2 AVTUR/FSII AF AF	Def Stan 91-91/3 AVTUR AF
SP			MIL-T-83133E n/a/AF	MIL-T-83133E n/AF
TU			MIL-T-83133D Amd 1 n/a/AF	
UK			Def Stan 91-87/2 (DERD 2453) AVTUR/FSII n/a/AF	Def Stan 91-91/3 (DERD 2494)**AVTUR (AF)
US			MIL-DTL-83133E n/a/AF	MIL-DTL-83133E AF
AP	SEA			
	LAND			
	AIR			F-34
ES	SEA			
	LAND			
	AIR		F-34/F-35*, F-40*, F-44*	F-40, F-44
REMARKS	* BE, Limited availability (+) Guide Specification	*Freezing Point of: F-34, F-35 -47°C F-40 -58°C F-44 -46°C ** CA, Limited availability	* BE, IT Limited availability ** Only available at civil airports	



**TABLE 1**

<b>NATO Code</b>		<b>F-37</b> TURBINE FUEL, AVIATION: Kerosene type with S-1749	<b>F-40 (3747)</b> TURBINE FUEL, AVIATION: Wide cut type with S-1745	<b>F-44 (3747)</b> TURBINE FUEL, AVIATION: High flash type with S-1745
AS			MIL-PRF-5624S	DEF (AUST) 5207 A n
BE			BA-PF-2 Iss G** (AF)	BA-PF-6B** n/(AF)
CA			CAN/CGSB 3-22 Iss 00 AF	3-GP-3.24d Iss 00 n/AF
CZ				
DA				MIL-PRF-5624T Grade JP-5 n/(AF)
FR				DCSEA 144/A n/(AF)
GE				Def Stan 91-86/2 n/AF
GR			MIL-PRF-5624S** AF	MIL—PRF-5624S (AF)
HU				
IT				AER-M-C.143b F-44 n/(AF)
LU				
NL				Def Stan 91-86/2 Am 1 (DERD 2452) n/(AF)
NO				MIL-DTL-5624T** Grade JP-5 n/(AF)
NZ			Def Stan 91-88/1 AF	DEF (Aust)5207A AF
PL				
PO				MIL-DTL-5624T Grade JP-5 n/AF
SP				MIL-PRF-5624S n/(AF)
TU			MIL-PRF-5624S Grade JP-4 n/a/AF	MIL-PRF-5624S Grade JP-5 N
UK			Def Stan 91-88/1 (DERD 2454) <b>AVTAG/FSII</b> n/a/AF	Def Stan 91-86/2 (DERD 2452) <b>AVCAT/FSII</b> n/AF
US		MIL-DTL-83133E AF	MIL-DTL-5624T Grade JP-4 N/a/af	MIL-DTL-5624T Grade JP-5 N/a/af
AP	SEA			
	LAND			
	AIR	F-34		F-34*
ES	SEA			
	LAND			
	AIR	F-35	F-34*, F-35*, F-44*	F-35*, F-40*
REMARKS		*Freezing Point of: F-34, F-35 -47°C F-40 -58°C F-44 -46°C ** BE, GR, Limited availability	* F-34, F-35, F-40 Not acceptable for stowage aboard warships Does not contain corrosion/inhibitor lubricity additive **BE NO Limited availability	



**TABLE 1**

<b>NATO Code</b>		<b>F-63 DIESEL FUEL</b>	<b>F-65 (7090) LOW TEMPERATURE FUEL BLEND (DIESEL)</b>	<b>F-67 (7090) GASOLINE AUTOMOTIVE Unleaded 95 RON</b>
AS				
BE				EN 228:1999* n/A/af
CA				
CZ				
DA				EN 228:1999* n/A/af
FR		DCSEA 108 Iss 1 n/A/af		
GE				EN 228:2000 n/A/af
GR				EN228:1993 n/A/af
HU				
IT				EN228:1993 n/A/af
LU				
NL				PVE 104530 A/af
NO				
NZ				
PL				
PO				
SP			STANAG 7090 A	
TU				
UK				BS EN228: 2000 <b>ULGAS</b> n/A/af
US			STANAG 7090 A/af	
AP	SEA			
	LAND	F-34, F-35, F-54, F-65	F-34*, F-35*, F-44, F-63	
	AIR			
ES	SEA			
	LAND	F-75	F-58	F-57
REMARKS			* Except GE	* BE, DA Limited stock

TABLE 1

NATO Code		F-75 (1385) FUEL, NAVAL DISTILLATE: Low pour point*	F-76 (1385) FUEL, NAVAL DISTILLATE:	F-77 FUEL, RESIDUAL: Light viscosity, boiler
AS			DEF (AUST) 5213 Am 2 N	
BE			BN-PF-71C Amd 1* N	
CA	3-GP-11c Type 15 N		3-GP-11-Mb N	
CZ				
DA				
FR	STM 7120 B Iss 3* N/a		STM 7120 B Iss3 N/a/af	STM 7110A Iss 2 Amd 1 N
GE	TL 9140-0003 Iss 7 N/a/af			
GR			MIL-F-16884 J* N/a/af	MIL-F-859E N
HU				
IT	MM C 1002/E Iss 1 N		MM C 1002/E Iss 1 N	
LU				
NL			KN 10323 Iss 3 N	
NO	STANAG 1385 N			
NZ			Def Stan 91-4/4 Amd 1 N/af	
PL				
PO			P TEST MAT 002 N	
SP			MIL-F-16884 J N	
TU			MIL-F-16884 J N	
UK			Def Stan 91-4/6 <b>DIESO F-76</b> N	
US			MIL-F-16884 J N/a/af	
AP	SEA	F-76**	F-75	
	LAND			
	AIR			
ES	SEA	F-44	F-44	
	LAND			
	AIR			
REMARKS	F-75 Minimum flash point is 60°C (140°F) * Content S<0.2% ** May require special handling and storage due to low temperature characteristics	*Flash Point Minimum 60°C (140°F) UK has more restrictive acceptance criteria in respect of water separability and particulate contamination		

TABLE 1

NATO Code		O-133 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum, Grade 1010 (2cSt)	O-134 LUBRICATING OIL, GENERAL PURPOSE: Petroleum, light	O-135 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum
AS		MIL-L-6081C (ASG) Grade 1010 n/a/af	Def Stan 91-44/1 Amd 1 n/a/af	Def Stan 91-99/1 (DERD 2490) n/a/af
BE		BA-PO-106A AF		BA-PO-115A** n/a/AF
CA		MIL-L-6081D (ASG) Grade 1010 n/AF		
CZ				
DA		MIL-L-6081D (ASG) Grade 1010 AF	Def Stan 91-44/1 Amd 1 A/af	Def Stan 91-99/1* n/(AF)
FR		AIR 3516/A Iss 2 n/AF		AIR 3515/B Iss 3 n/a/AF
GE		MIL-L-6081D (ASG) Grade 1010 n/AF		Def Stan 91-99/1* n/a/AF
GR		MIL-L-6081C (ASG) Grade 1010 n/AF	Def Stan 91-44/1 Amd 1 (A)	
HU				
IT		AA-M-0.242e n/a/AF	AA-M-0.277d* n/(A)/af	AIR 3515 B Iss 3 AF
LU				
NL		MIL-L-6081C (ASG) Grade 1010 n/AF	Def Stan 91-44/1 Amd 1 n/A/af	
NO		MIL-PRF-6081D (ASG) Grade 1010 AF	Def Stan 91-44/1 Amd 1 (A)/af	Def Stan 91-99/1* (DERD 2490) n/AF
NZ		MIL-L-6081C (ASG) Grade 1010 AF	Def Stan 91-44/1 Amd 1 AF	Def Stan 91-99/1 (DERD 2490) AF
PL				
PO		MIL-PRF-6081D Grade 1010 AF		Def Stan 91-99/1* AF
SP		MIL-PRF-6081D Grade 1010 n/AF	Def Stan 91-44 n/a/AF	
TU		MIL-PRF-6081D (ASG) Grade 1010 n/a/AF		Def Stan 91-99/1* (DERD 2490) n/AF/af
UK			Def Stan 91-44/1 Amd 1 (+) <b>OM 13</b> n/A/af	Def Stan 91-99/1* (+) (DERD 2490) <b>OM-11</b> n/AF
US		MIL-PRF-6081D (ASG) (+) Grade 1010 n/AF		
AP	SEA			
	LAND		O-135	
	AIR			
ES	SEA			
	LAND		O-142	
	AIR			O-134
REMARKS	Q (+) Guide Specification	Q * Qualification not required (+) Guide Specification	Q *Qualification not required (+) Guide Specification	

TABLE 1

NATO Code		O-136 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum, extreme pressure	O-138 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum	O-142 LUBRICATING OIL, GENERAL PURPOSE: Low temperature
AS		Def Stan 91-97/1 (DERD 2479) a/af	Def Stan 91-97/1 (DERD 2479) a/af	MIL-PRF-7870C n/a/af
BE		BA-PO-103B AF	BA-PO-103B n/a/AF	BA-PO-102A AF
CA				MIL-L-7870B Amd 1 n/AF
CZ				
DA				MIL-PRF-7870C AF
FR			AIR 3512/A Iss 2 n/a/AF	
GE			Def Stan 91-97/1* a/AF	
GR			AIR 3512/A Iss 2 AF	MIL-L-7870B Amd 1 n/a/AF
HU				
IT				AA-M-0.278e n/a/AF
LU				
NL		Def Stan 91-97/1 n/(AF)	Def Stan 91-97/1 AF	MIL-PRF-7870C Amd 1 n/AF
NO		Def Stan 91-97/1 (DERD 2479) AF		Def Stan 91-47/1 AF
NZ			Def Stan 91-97/1 (DERD 2479) AF	MIL-PRF-7870C AF
PL				
PO			AIR 3512/A Iss 2 n/(AF)	MIL-PRF-7870C n/AF
SP			AIR 3512 A Iss 2 n/a/AF	MIL-PRF-7870C n/a/AF
TU			Def Stan 91-97/1 AF	MIL-PRF-7870C n/a/AF
UK		DEF STAN 91-97/1 (+) (DERD 2479) <b>OEP-71</b> n/a/AF	Def Stan 91-97/1 (+) (DERD 2479) <b>OM-71</b> n/a/AF	Def Stan 91-47/1 (+) <b>OM-12</b> n/a/AF
US				MIL-PRF-7870C Amd 1 n/a/AF
AP	SEA			
	LAND			
	AIR		O-136	
ES	SEA			
	LAND			
	AIR	O-138		O-134*, O-135*, O-190
REMARKS	Q (+) Guide Specification	Q (+) Guide Specification	Q * Except for extreme low temperatures (+) Guide Specification	

TABLE 1

NATO Code		O-147 LUBRICATING OIL, INSTRUMENT: Synthetic	O-148 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic 3 cSt	O-149 LUBRICATING OIL AIRCRAFT TURBINE ENGINE Synthetic 7.5 cSt
AS		MIL-PRF-6085D n/a/af	MIL-PRF-7808L Grade 3 a/af	Def Stan 91-98/1 (DERD 2487) n/a/af
BE		BA-PO-105A Amd 1 n/a/AF	BA-PO-109C a/AF	Def Stan 91-98/1 (DERD 2487) AF
CA		MIL-PRF-6085D n/AF	MIL-PRF-7808L Grade 3 n/AF	
CZ				
DA		MIL-PRF-6085D a/AF	MIL-PRF-7808L Grade 3 AF	Def Stan 91-98/1 AF
FR		AIR 3511/A Iss 2 n/AF		
GE		MIL-PRF-6085D n/a/AF	MIL-PRF-7808L Grade 3 n/a/AF	Def Stan 91-98/1 n/AF
GR		MIL-L-6085C n/a/AF	MIL-PRF-7808L n/a/AF	Def Stan 91-98/1 (DERD 2487) n/AF
HU				
IT		AM M 0.279/d n/AF	MIL-L-7808K n/a/AF	Def Stan 91-98/1 (DERD 2487) AF
LU				
NL		MIL-PRF-6085E n/AF	MIL-PRF-7808L Grade 3 AF	Def Stan 91-98/1 n/AF
NO		MIL-PRF-6085D AF	MIL-PRF-7808L Grade 3 AF	Def Stan 91-98/1 (DERD 2487) AF
NZ		MIL-PRF-6085D AF		Def Stan 91-98/1 (DERD 2487) AF
PL				
PO		MIL-PRF-6085D n/AF	MIL-PRF-7808L Grade 3 AF	
SP		MIL-PRF-6085D n/a/AF	MIL-PRF-7808L Grade 3 n/a/AF	Def Stan 91-98/1 n/a/AF
TU		MIL-PRF-6085D n/AF	MIL-PRF-7808L Grade 3 n/a/AF	Def Stan 91-98/1 (DERD 2487) n/AF
UK		Def Stan 91-49/1 <b>OX-14</b> n/AF	MIL-PRF-7808L Grade 3 <b>OX-9</b> a/AF	Def Stan 91-98/2 (+) (DERD 2487) <b>OX-38</b> n/AF
US		MIL-PRF-6085D Amd 1 (+) n/a/AF	MIL-PRF-7808L Grade 3 (+) a/AF	
AP	SEA			
	LAND			
	AIR		0-163	
ES	SEA			
	LAND			
	AIR		O-149*, O-150, O-156	O-148*, O-154, O-156*, O-159
REMARKS	Q (+) Guide Specification	Q * Up to 50% of O-149 as an emergency substitute may be placed in an engine containing O-148 (+) Guide Specification	Q * Up to 50% of O-148 or O-156 as an emergency substitute may be placed in an engine containing O-149 (+) Guide Specification	

TABLE 1

NATO Code		O-150 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic 3cSt	O-152 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic, corrosion inhibited 5cSt	O-153 LUBRICATING OIL, GEAR: Aircraft, light grade
AS				MIL-PRF-6086E Grade L n/a/af
BE				
CA				
CZ				
DA				MIL-PRF-6086E Grade L n/a/AF
FR		AIR 3514/A Iss 2 n/a/AF		
GE				Def Stan 91-112/1 n/a/AF
GR		AIR 3514/A Iss 2 n/AF		MIL-L-6086D Grade L n/a/AF
HU				
IT				AA-M-0.281 AF
LU				
NL				MIL-PRF-6086E Grade L n/a/AF
NO		AIR 3514/A Iss 2 AF		MIL-PRF-6086E Grade L n/AF
NZ				MIL-L-6086D Grade L AF
PL				
PO			MIL-PRF-23699F Class C/I n/AF	MIL-PRF-6086E Grade L a/AF
SP		AIR 3514/A Iss 2 n/a/AF		MIL-PRF-6086E Grade L AF
TU			MIL-PRF-23699F Class C/I n/AF	MIL-PRF-6086E Grade L n/AF
UK				Def Stan 91-112/1* <b>OEP-30</b> n/AF
US			MIL-PRF-23699F (+) Class C/I N/af	MIL-PRF-6086E (+) Grade L AF
AP	SEA			
	LAND			
	AIR		O-148, O-154, O-156, O-160, O-163	
ES	SEA			
	LAND			
	AIR	O-156, O-148	O-149, O-150	O-155
REMARKS		Q	Q (+) Guide Specification	Q * UK, Limited availability (+) Guide Specification



TABLE 1

NATO Code		O-154 LUBRICATING OIL, AIRCRAFT ENGINE TURBINE: Synthetic 5 cST, HTS	O-155 LUBRICATING OIL, GEAR: Aircraft, medium grade	O-156 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic 5 cSt
AS			MIL-PRF-6086E Grade M n/a/af	MIL-PRF-23699F n/a/af
BE			BA-PO-107C Amd 1 n/a/AF	MIL-PRF-23699F Class STD AF
CA	MIL-PRF-23699F Class HTS n/a/AF	MIL-PRF-6086E Grade M n/AF		MIL-PRF-23699F Class STD n/AF
CZ				
DA		MIL-PRF-6086E Grade M n/AF		
FR		DCSEA 255/A n/a/AF		MILPRF-23699F Class STD n/a/AF
GE		Def Stan 91-112/1 n/AF		MIL-PRF-23699F Class STD n/a/AF
GR		MIL-L-6086D Grade M n/a/AF		MIL-PRF-23699F Class STD n/a/AF
HU				
IT		AA-M-0.282e n/AF		MIL-PRF-23699F Class STD n/a/AF
LU				
NL		MIL-PRF-6086E n/AF		MIL-PRF-23699F Class STD n/AF
NO		DTD 581C Iss 1 Amd 1 AF		MIL-PRF-23699F Class STD AF
NZ				MIL-PRF-23699F Class STD AF
PL				
PO		MIL-PRF-6086E Grade M AF		MIL-PRF-23699F Class STD n/AF
SP		MIL-PRF-6086E Grade M n/AF		MIL-PRF-23699F Class STD n/a/AF
TU		MIL-PRF-6086E Grade M a/AF		MIL-PRF-23699F Class STD n/a/AF
UK		Def Stan 91-112/1 <b>OEP-70</b> n/a/AF		Def Stan 91-101/3 (DERD 2499) <b>OX-27</b> n/a/AF
US	MIL-PRF-23699F* Class HTS AF	MIL-PRF-6086E (+) Grade M n/a/AF		MIL-PRF-23699F (+) Class STD N/a/af
AP	SEA			
	LAND			
	AIR	0-156: 0-160: 0-163	0-154: 0-160: 0-163	0-148: 0-154: 0-160: 0-163
ES	SEA			
	LAND			
	AIR	0-148, 0-150	0-148, 0-149, 0-150, 0-153	0-149, 0-150
REMARKS	Q *US, No stock	Q (+) Guide Specification	Q (+) Guide Specification	

TABLE 1

NATO Code		O-157 LUBRICATING OIL, LOW TEMPERATURE, WEAPONS	O-158 GREASE, AIRCRAFT: Semifluid	O-159 LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic 7.5 cSt
AS		MIL-L-14107C Amd 2 af	MIL-L-46000C n/a/af	
BE			MIL-L-46000C A/af	
CA		MIL-L-14107C Amd 2 n/a/AF	MIL-L-46000C n/A/af	
CZ				
DA			MIL-L-46000C (A)/af	
FR				AIR 3517A Iss 2 n/AF
GE			MIL-L-46000C A/af	
GR		MIL-L-14107C Amd 2 AF	MIL-L-46000C n/A/af	AIR 3517A Issue 2 n/AF
HU				
IT		AA-M-0.291D Amd 1 AF		
LU				
NL		MIL-L-14107C Amd 2 AF	MIL-L-46000C n/AF	
NO			MIL-L-46000C n/(A)/af	
NZ				
PL				
PO			MIL-L-46000C A	
SP		MIL-L-14107C Am 2 n/a/AF	MIL-L-46000C n/A/af	AIR 3517 A Iss 2 a/AF
TU		MIL-L-14107C Amd 2 a/AF	MIL-L-46000C A/af	
UK		Def Stan 91-102/2 (+) <b>OX-24</b> n/A/af		
US		MIL-L-14107D AF	MIL-L-46000C (+) n/A/af	
	SEA			
AP	LAND		S-758*	
	AIR			
	SEA			
ES	LAND			
	AIR			O-149
REMARKS	Q (+) Guide Specification	Q * US only (+) Guide Specification	Q	

TABLE 1

NATO Code		O-160 LUBRICATING OIL AIRCRAFT TURBINE ENGINE: Synthetic 5 cSt	O-163 4cSt, AVIATION TURBINE OIL	O-183 LUBRICATING OIL, ENGINE: Sub Zero
AS				
BE				
CA			MIL-PRF-7808L Grade 4 AF	MIL-L-46167B Amd 1 n/A
CZ				
DA		Def Stan 91-100/1 n/AF	MIL-PRF-7808L Grade 4 AF	
FR				
GE		Def Stan 91-100/2 (DERD 2497) n/AF		
GR		Def Stan 91-100/1 (DERD 2497) AF	MIL-L-7808K Grade 4 AF	
HU				
IT		Def Stan 91-100/1 (DERD 2497) AF		
LU				
NL		Def Stan 91-100/1 (DERD 2497) n/(AF)	MIL-PRF-7808L Grade 4 AF	
NO		Def Stan 91-100/1 AF		
NZ				
PL				
PO				
SP		Def Stan 91-100/1 (DERD 2497) AF		
TU		Def Stan 91-100/1 AF	MIL-PRF-7808L Grade 4 n/a/AF	MIL-L-46167B Amd 1 n/AF
UK		Def Stan 91-100/3 (+) (DERD 2497) <b>OX-26</b> a/AF		
US			MIL-PRF-7808L (+) Grade 4 n/a/AF	MIL-PRF-46167C (+) n/A/af
AP	SEA			
	LAND			
	AIR	0-154	O-148, O-150	
ES	SEA			
	LAND			O-149
	AIR	O-148, O-149, O-150, O-163	O-149, O-154, O-156, O-160	
REMARKS		Q (+) Guide specification	Q (+) Guide specification	Q (+) Guide specification

TABLE 1

NATO Code		O-186 (7091) LUBRICATING OIL, GEAR: Extreme pressure, Grade 75W	O-190 LUBRICATING OIL, GENERAL PURPOSE: Preservative, light	O-192 LUBRICATING OIL, GENERAL PURPOSE: Preservative, medium
AS			VV-L-800C Am 1 n/a/af	
BE		BT-PO-152 Iss C n/af/A		
CA		MIL-PRF-2105E Grade 75W n/af/A	VV-L-800C Amd 1 n/A/af	
CZ				
DA				
FR				DCSEA 231 Iss 2 n/A
GE		MIL-PRF-2105E* Grade 75W n/A/af		
GR		MIL-PRF-2105E Grade 75W n/A	VV-L-800C Amd 1* n/A/af	MIL-PRF-3150C Amd 2* n/A/af
HU				
IT			AA-M-0.293b A/af	AA-M-1.393/b n/A/af
LU				BT-PO-164 Grade M A
NL		MIL-PRF-2105E* Grade 75W A	VV-L-800C Amd 1 n/A/af	MIL-PRF-3150C Amd 2 n/(A)
NO			MIL-PRF-32033 n/(A)/af	
NZ				
PL				
PO		MIL-PRF-2105E Grade 75W A	VV-L-800C Amd 1 n/A	MIL-PRF-3150C Amd 2 n/A
SP			Def Stan 91-79 A/af	MIL-PRF-3150C Amd 2 n/A/af
TU			VV-L-800C Amd 1 n/A/af	MIL-PRF-3150C Amd 2 N/a/af
UK		Def Stan 91-59/2 <b>OEP-38</b> A	Def Stan 91-79/1 <b>OX-18</b> n/a/AF	
US		MIL-PRF-2105E Grade 75W n/A/af	MIL-PRF-32033 A	MIL-PRF-3150D Amd 1 (+) n/A/af
AP	SEA			
	LAND		O-142, S-758**, S-761, 0-157	C-642
	AIR			
ES	SEA			
	LAND	O-226	O-134, S-758	O-134
	AIR			
REMARKS		Q * GE, NL, Limited availability	Q * GR, Limited availability ** S-758, US only	Q (+) Guide specification * GR, Limited availability

**TABLE 1**

<b>NATO Code</b>		<b>O-204</b> LUBRICATING OIL, SEMI LIQUID FOR MACHINE GUNS	<b>O-208</b> LUBRICATING OIL, GEAR: Compounded	<b>O-214</b> CUTTING FLUID: Soluble
AS			Def Stan 91-65/1 n/a/af	VV-C-846 Amd 1 Type 1
BE				BT-PO-156A A/af
CA				
CZ				
DA				
FR				
GE		TL 9150-069 Iss 3 (+) A		TL 9150-0047 Iss 3 n/A/af
GR				VV-C-846A Amd 1 Type 1 n/A
HU				
IT				
LU				
NL		TL 9150-069 Iss 3 A		
NO				
NZ				
PL				
PO				
SP				
TU			Def Stan 91-65/1 n/AF	
UK			Def Stan 91-65/1 (+) <b>OC-600</b> n/A/af	
US				VV-C-846B (+) n/A/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q (+) Guide specification	(+) Guide specification	(+) Guide specification	

TABLE 1

NATO Code		O-226 (7091) LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 80W/90	O-228 (7091) LUBRICATING OIL, GEAR: Extreme pressure, Grade 85W/140	O-236 (7091) LUBRICATING OIL, ENGINE: Severe duty, diesel engine service, multigrade 15W/40
AS		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 n/A/af	
BE		BT-PO-152C Grade 80W/90 n/A/af	BT-PO-152C Grade 85W/140 n/A/af	BT-PO-165E n/A/af
CA				
CZ				
DA		MIL-PRF-2105E Grade 80W/90 n/A/af		TL 9150-0063/4 n/A/af
FR		DCSEA 220A Iss 2 Grade 80W/90 n/A/af	DCSEA 220/A* Iss 2 Grade 85W/140 n/A/af	DCSEA 214/B Iss 2 n/A/af
GE		MIL-PRF-2105E Grade 80W/90 n/A/af		TL 9150-0063/4 n/A/af
GR		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 n/A	
HU				
IT		MIL-PRF-2105E Grade 80W/90 n/A/af		
LU		BT-PO-152B Grade 80W/90 A	BT-PO-152B Grade 85W/140 n/A/af	
NL		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 n/A/af	TL 9150-0063/ Iss 4 n/A/af
NO		MIL-PRF-2105E Grade 80W/90 n/A/af		
NZ		MIL-PRF-2105E Grade 80W/90 AF	MIL-PRF-2105E Grade 85W/140 AF	
PL				
PO		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 n/A	
SP		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 n/A/af	
TU		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 n/A/af	
UK		Def Stan 91-59/2 <b>OEP-220</b> n/A/af		
US		MIL-PRF-2105E Grade 80W/90 n/A/af	MIL-PRF-2105E Grade 85W/140 A/af	
AP	SEA			
	LAND			O-1179, O-1236
	AIR			
ES	SEA			
	LAND	O-228	O-226	O-1176, O-1178
	AIR			
REMARKS	Q	Q	Q	

TABLE 1

NATO Code		O-237 (7091) LUBRICATING OIL, ENGINE: Severe duty, diesel service, Grade 10W	O-238 (7091) LUBRICATING OIL, ENGINE: Severe duty, diesel service, Grade 30	O-239 LUBRICATING OIL, ENGINE: Severe duty, diesel Grade 50
AS			MIL-PRF-2104G Grade 30 n/A/af	
BE		MIL-PRF-2104G Grade 10W n/af	MIL-PRF-2104G Grade 30 n/A/af	
CA		MIL-PRF-2104G Grade 10W n/A/af	MIL-PRF-2104G* Grade 30 n/A	
CZ				
DA		MIL-PRF-2104G Grade 10W n/A	MIL-PRF-2104G Grade 30 n/A	
FR				DCSEA 214/B Iss 2 Grade 50 n/A/af
GE				
GR		MIL-PRF-2104G Grade 10W n/A/af	MIL-PRF-2104G Grade 30 n/A/af	DCSEA 214/B Iss 2 Grade 50 A
HU				
IT				
LU				
NL		MIL-PRF-2104G Grade 10W n/A/af	MIL-PRF-2104G Grade 30 n/A/af	
NO				
NZ			MIL-PRF-2104G Grade 30 AF	
PL				
PO		MIL-PRF-2104G Grade 10W A	MIL-PRF-2104G Grade 30 A	DCSEA 214/B Iss 2 Grade 50 A
SP		MIL-PRF-2104G Grade 10W n/A/af		DCSEA 214/B Iss 2 Grade 50 n/A/af
TU		MIL-PRF-2104G Grade 10W n/A/af	MIL-PRF-2104G Grade 30 n/A	DCSEA 214/B Iss 2 Grade 50 A
UK				
US		MIL-PRF-2104G Grade 10W n/A/af	MIL-PRF-2104G Grade 30 n/A/af	
AP	SEA			
	LAND		0-236, 0-1236	
	AIR			
ES	SEA			
	LAND			0-236, 0-1236
	AIR			
REMARKS		Q	Q * CA, Limited availability	Q

TABLE 1

NATO Code		O-240 LUBRICATING OIL, STEAM TURBINE AND GEAR: Light service	O-249* LUBRICATING OIL, STEAM TURBINE AND GEAR: Extreme pressure	O-250 LUBRICATING OIL, STEAM TURBINE AND GEAR: Moderate service
AS		DEF (AUST) 5255* n/A/af		DEF (AUST) 5257* Amd 1 n/a/af
BE		BN-PO-175C N		
CA		3-GP-357-c N/a/af		
CZ				
DA				MIL-L-17331H N
FR		STM 7220B Iss 3 Amd 1 Grade TH4 N	STM 7240/B Iss3 N	
GE				TL 9150-0025 Iss 4 N
GR				MIL-L-17331H N/a
HU				
IT		MM-O-2001 Iss 1 N		MIL-L-17331H N
LU				
NL		Def Stan 91-25/2 N		
NO				MIL-PRF-17331H Amd 3 N
NZ		Def Stan 91-25/3 N		
PL				
PO		STM 7220/B Amd 1 Grade TH4 N		MIL-L-17331H N
SP				MIL-L-17331H N/af
TU				MIL-L-17331H N/a/af
UK		Def Stan 91-25/3 <b>OM-100</b> N/a		
US				MIL-PRF-17331H Amd 3 (+) N/a/af
AP	SEA	O-250		
	LAND			
	AIR			
ES	SEA	O-249	O-240, O-250	O-240, O-249
	LAND			
	AIR			
REMARKS		Q * Replaces DEF (AUST) 255 when available	Q *Meets ISO-VG-68	Q * Replaces DEF (AUST) 257 when available (+) Guide Specification



TABLE 1

NATO Code		O-252 LUBRICATING OIL, STEAM CYLINDER: Saturated	O-254 LUBRICATING OIL, COMPOUNDED: Naval	O-258 LUBRICATING OIL, STEAM CYLINDER: Superheated
AS		BS 4475: 1991 Grade CS-680 n/a		BS 4475:1991 Grade CS-1000 n/a
BE				
CA				
CZ				
DA		BS 4475: 1991 Amd 1 Grade CS-680 N		MIL-PRF-53074A N
FR		STM 7261 Iss 1 Amd 3* N	STM 7260 Iss 1 Amd 1 N	STM 7261 Iss 1 Amd 3 N
GE				
GR		BS 4475:1991 Amd 1 Grade CS-680 N	Def Stan 91-21/3 N	MIL-L-53074 N/a
HU				
IT				
LU				
NL		BS 4475: 1991 Amd 1 Grade CS-680 N	Def Stan 91-21/2 N	
NO		BS 4475: 1975 Grade CS-680 N		
NZ				
PL				
PO		STM 7261 Amd 3 N	STM 7260 Amd 1 N	STM 7261 Amd 3 N
SP				
TU				
UK		BS 4475: 2000 Grade CS-680 <b>OM-750</b> N/a/af	Def Stan 91-21/3 <b>OC-160</b> N/a/af	BS 4475: 2000 Grade CS-1000 <b>OM-1300</b> N/a/af
US				MIL-PRF-53074A N/af
AP	SEA			
	LAND			
	AIR			
ES	SEA	O-258		
	LAND			
	AIR			
REMARKS	* No stock			

TABLE 1

NATO Code		O-262 LUBRICATING OIL, NAVAL GEAR: Extreme pressure	O-274 LUBRICATING OIL, NAVAL DIESEL: Moderate service	O-278 LUBRICATING OIL, NAVAL DIESEL: Severe service Grade 40
AS				Def Stan 91-22/3 n/A
BE				BN-PO-178B Amd 1 N
CA				MIL-L-9000H N/a
CR				
DA				MIL-PRF-9000H N
FR			STM 7250/A Iss 2 Amd 1 Grade 30 N	STM 7251/A Iss 2 Amd 2 N/a/af
GE		TL 9150-0070 Iss 2 (+) N/a/af		TL 9150-0031 Iss 2 N/a/af
GR				MIL-L-9000H N
HU				
IT			MM 0 2009 Issue 1* Grade 30 N	MM 900 N
LU				
NL		TL 9150-0070 Iss 1 N	STM 7250/A Iss 1 Amd 1 Grade 30 N	Def Stan 91-22/2 Amd 3 N
NO				Def Stan 91-22/2 Amd 3 N
NZ				MIL-L-9000H N
PL				
PO				MIL L 9000H N
SP				MIL-L-9000H N
TU				MIL-L-9000H N
UK				Def Stan 91-22/4 <b>OMD-113</b> N/a
US				MIL-PRF-9000H N
AP	SEA		O-278	
	LAND			
	AIR			
ES	SEA	O-249*	O-238	O-238, O-274
	LAND			
	AIR			
REMARKS		Q * GE only (+) Guide specification	Q SAE Grade 30 * IT, Limited availability	Q

TABLE 1

NATO Code		O-283 LUBRICATING OIL, REFRIGERANT COMPRESSOR: Inhibited	O-285 LUBRICATING OIL, REFRIGERANT COMPRESSOR: Uninhibited	O-290 LUBRICATING OIL, REFRIGERANT COMPRESSOR: Inhibited
AS				
BE				
CA			3-GP-44-Mb N/a/af	
CZ				
DA		VV-L-825C Type II N		
FR		STM 7272 Iss 1 Amd 3 CF-2 N		STM 7272 Iss 1 Amd 3 CF-1 N
GE		TL 9150-0058 Iss 5 N/af		
GR		VV-L-825B Amd 2 Type II N		VV-L-825B Amd 2 Type IV AF
HU				
IT		MM-O-2008 Type II N		MM-O-2008 Type IV N
LU				
NL		VV-L-825B Amd 1 Type II N/af		VV-L-825B Amd 1 Type IV N/af
NO			BS 2626 1992 Type A Grade 68 N	
NZ			BS 2626 1992 Type A Grade 68 N	
PL				
PO		STM 7272 Amd 3 CF-2 N		STM 7272 Amd 3 CF-1 N
SP		VV-L-825B Amd 1 Type II N		VV-L-825B Amd 1 Type IV N
TU		VV-L-825C Type II N/a/af		VV-L-825C Type IV N
UK			BS 2626 1992 Type A, Grade 68 <b>OM-70</b> N/a	
US		VV-L-825C Type II N/a		VV-L-825C Type IV N
AP	SEA			
	LAND			
	AIR			
ES	SEA	O-285	O-283	
	LAND			
	AIR			
REMARKS		Used with refrigerants R-11 and R-12	Used with refrigerants R-11, R-12 and R-22	Used with refrigerant R-22

TABLE 1

NATO Code		O-1176 (7091) LUBRICATING OIL, ENGINE: Severe duty, diesel engine service, SAE 10W/30	O-1177 LUBRICATING OIL, GASOLINE ENGINE: Two Stroke	O-1178 (7091) LUBRICATING OIL, ENGINE: Severe duty, diesel engine service, Grade SAE 5W/30
AS				
BE			DCSEA 242/A Iss 1 n/A/af	
CA				
CZ				
DA				
FR		DCSEA 214/B Iss 2* n/A/af	DCSEA 242/A Iss 1 (+) n/A/af	
GE			DCSEA 242/A Iss 1 n/A/af	TL 9150-0080 Iss 1 n/A/af
GR		DCSEA 214/B Iss 2 A/af		
HU				
IT				
LU				
NL			DCSEA 242/A Iss 1* A/af	
NO		FS 9150-1036 Iss 1 n/A/af	DCSEA 242/A Iss 1 n/A/af	
NZ				
PL				
PO			DCSEA 242/A Iss 1* n/A/af	
SP			DCSEA 242/A Iss 1* n/A/af	TL 9150-0063 Iss 3 A
TU				
UK		Def Stan 91-113/1 <b>OMD-90</b> n/A/af		Def Stan 91-68/1 <b>OMD-55</b> n/A/af
US				
	SEA			
AP	LAND			0-1179
	AIR			
	SEA			
ES	LAND	O-237, O-238, O-1178, O-1179		O-183, O-236, O-1176*
	AIR			
REMARKS		Q * FR Limited availability	Q (+) Guide specification * NL, PO, SP, No Stock	Q * Dependent on ambient temperature

TABLE 1

NATO Code		0-1179 (7091) LUBRICATING OIL ENGINE DUTY Multigrade 5W-40	O-1236 LUBRICATING OIL, ENGINE: Severe duty, diesel and gasoline service, Grade 15W/40	G-353 GREASE, AIRCRAFT: Synthetic, molybdenum disulfide*
AS				MIL-G-21164D n/a/af
BE	DCSEA 215/A Iss 1* A			BA-PG-409B a/AF
CA		MIL-PRF-2104G Grade 15W/40 n/A		MIL-G-21164D n/a/AF
CZ				
DA				MIL-G-21164D n/a/AF
FR	DCEA 215/A Iss 1 n/A/af			AIR 4217/A Iss 2 n/a/AF
GE				MIL-G-21164D AF
GR		MIL-PRF-2104G Grade 15W/40 n/A		MIL-G-21164D n/AF
HU				
IT				MIL-G-21164D n/a/AF
LU				
NL	DCSEA 215/A Iss 1* A			MIL-G-21164D n/a/AF
NO	DCSEA 215/A Iss 1 A			Def Stan 91-57/2 n/a/AF
NZ				MIL-G-21164D AF
PL				
PO		MIL-PRF-2104G Grade 15W/40 n/A/af		MIL-G-21164D a/AF
SP		MIL-PRF-2104G Grade 15W/40 n/A/af		MIL-G-21164D n/a/AF
TU		MIL-L-2104E Grade 15W/40 n/A/af		MIL-G-21164D n/a/AF
UK				Def Stan 91-57/2** <b>XG-276</b> n/a/AF
US		MIL-PRF-2104G (+) Grade 15W/40 n/A/af		MIL-G-21164D N/a/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND	O-236		
	AIR			
REMARKS	Q *BE, NL Limited availability	Q (+) Guide Specification	Q *Operating temperature range -73°C to +121°C ** Qualification not required	

TABLE 1

NATO Code		G-354 GREASE, AIRCRAFT: Synthetic, extreme pressure*	G-355 GREASE, AIRCRAFT: Graphite*	G-359 GREASE, AIRCRAFT: High temperature*
AS		MIL-G-23827B Amd 1 n/a/af	Def Stan 91-54/1 Amd 1 n/a/af	
BE		BA-PG-411A n/a/AF		
CA		MIL-PRF-23827C n/a/AF		
CZ				
DA		Def Stan 91-53/1 Amd 1 n/a/AF	Def Stan 91-54/1 Amd 1 AF	
FR		AIR 4210/B Iss 3 n/a/AF	AIR 4206/B Iss 3 n/a/AF	AIR 4205/B Iss 3 n/a/AF
GE		MIL-PRF-23827C AF	Def Stan 91-54/1 Amd 1 n/a/AF	
GR		MIL-G-23827B Amd 1 n/a/AF	MIL-G-7187 Amd 1 n/a/AF	MIL-G-3545C Amd 1 (MR) n/AF
HU				
IT		AAMG312/f n/a/AF		AIR 4205/B Iss 3 AF
LU				
NL		MIL-G-23827B Amd 1 n/a/AF	Air 4206/B Iss 3 AF	AIR 4205/C (MR) n/a/AF
NO		MIL-G-23827B Amd 1 n/AF	Def Stan 91-54/1 Amd 1 n/AF	
NZ		MIL-G-23827B Amd 1 AF	Def Stan 91-54/1 Amd 1 AF	MIL-G-3545C Amd 1 (MR) AF
PL				
PO		MIL-PRF-23827C n/a/AF	Def Stan 91-54/1 Amd 1 n/AF	
SP		MIL-G-23827C n/a/AF	AIR 4206/B Iss 3 a/AF	AIR 4205/B n/a/AF
TU		MIL-G-23827B Amd 1 n/a/AF	AIR 4206 1B Iss 3 A	AIR 4205/B A
UK		Def Stan 91-53/2 (+) <b>XG-287</b> n/AF	Def Stan 91-54/1 Amd 1 (+) <b>XG-285</b> n/a/AF	
US		MIL-PRF-23827C N/a/af		
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR		G-382	G-382
REMARKS		Q * Operating temperature range -73°C to +121°C (+) Guide Specification	Q * Operating temperature range -40°C to +121°C (+) Guide Specification	Q * Operating temperature range -18°C to +149°C

TABLE 1

NATO Code		G-361 GREASE, AIRCRAFT: Synthetic, wide temperature*	G-363 GREASE, PLUG VALVE, HYDROCARBON RESISTANT	G-366 GREASE, AIRCRAFT: Helicopter oscillating bearing*
AS			Def Stan 91-6/3 n/a/af	MIL-G-25537C Amd 1 n/a/af
BE			BA-PG-407A Amd 3 a/AF	BA-PG-413A Amd 1 a/AF
CA			MIL-G-6032D Amd 1 Type I n/a/AF	MIL-G-25537C Amd 1 n/a/AF
CZ				
DA	Air 4207/A Iss 2 AF		MIL-G-6032D Amd 1 Type I n/AF	MIL-G-25537C Amd 1 AF
FR	AIR 4207/A Iss 2 n/a/AF		DCSEA 363/A n/a/AF	
GE			SAE AMS-G-6032 Type I n/a/AF	
GR	MIL-G-25760A (ASG) Amd 3 AF		MIL-G-6032D Amd 1 Type I AF	MIL-G-25537C Amd 1 n/a/AF
HU				
IT			AA MG 313/e n/a/AF	AA MG 306/a n/a/AF
LU				
NL	AIR 4207/A Iss 2 AF		MIL-G-6032D Amd 1 Type I n/a/AF	MIL-G-25537C Amd 1 n/AF
NO			MIL-G-6032D Amd 1 Type I AF	Def Stan 91-51/1 Amd 1 n/AF
NZ			Def Stan 91-6/3 AF	MIL-G-25537C Amd 1 AF
PL				
PO			SAE AMS-G-6032 Type I AF	MIL-G-25537C Amd 1 n/AF
SP			SAE AMS-G-6032 Type I n/a/AF	MIL-G-25537C Amd 1 n/a/AF
TU	AIR 4207/A A		MIL-G-6032D Amd 1 Type I n/a/af	MIL-G-25537C Amd 1 n/a/af
UK			Def Stan 91-6/4 (+) <b>XG-235</b> n/a/AF	Def Stan 91-51/1 Amd 1 <b>XG-284</b> n/a/AF
US			SAE AMS-G-6032 Type I N/a/af	MIL-G-25537C Amd 1 (+) N/a/af
AP	SEA			
	LAND			
	AIR	G-395		
ES	SEA			
	LAND			
	AIR			
REMARKS	Q * Operating temperature range -40°C to +177°C	Q (+) Guide Specification	Q * Operating temperature range -54°C to +71°C (+) Guide Specification	

TABLE 1

NATO Code		G-372 GREASE, AIRCRAFT: Synthetic, high temperature*	G-382 GREASE, AIRCRAFT: General purpose*	G-392 GREASE, AIRCRAFT: Synthetic, pneumatic system*
AS		MIL-G-25013E n/a/af		MIL-G-4343C n/a/af
BE			BA-PG-401A Amd 1 a/AF	BA-PG-412A Type US n/AF
CA		MIL-G-25013E n/AF		MIL-G-4343C n/AF
CZ				
DA		MIL-G-25013E n/a/AF	Def Stan 91-12/1 n/(AF)	MIL-G-4343C a/AF
FR			AIR 4215/B Iss 3 n/a/AF	MIL-G-4343C n/a/AF
GE		MIL-G-25013E n/AF		
GR		MIL-G-25013E n/AF	MIL-G-7711A Amd 1 n/a/AF	MIL-G-4343C n/AF
HU				
IT		AA MG 305/c n/a/AF		AA M G 321/B*** n/AF
LU				
NL		MIL-G-25013E n/a/AF	Def Stan 91-12/1 n/AF	MIL-G-4343C n/a/AF
NO		MIL-G-25013E AF	Def Stan 91-12/1 n/AF	MIL-G-4343C AF
NZ		MIL-G-25013E AF		MIL-G-4343C AF
PL				
PO		MIL-G-25013E AF	Def Stan 91-12/1 n/AF	SAE AMS-G-4343 n/AF
SP		MIL-G-25013E n/a/AF	Def Stan 91-12/1 n/a/AF	SAE AMS-G-4343 n/a/AF
TU		MIL-G-25013E n/a/AF	AIR 4215/B Iss 3** AF	MIL-G-4343C n/AF
UK		MIL-G-25013E XG-300** n/AF	Def Stan 91-12/1 (+) XG-271 n/a/AF	SAE AMS-G-4343 XG-269** AF
US		MIL-G-25013E (+) N/a/af		MIL-G-4343C (+) N/a/af
AP	SEA			
	LAND			
	AIR		G-395	
ES	SEA			
	LAND			
	AIR		G-359	G-394
REMARKS	Q * Operating temperature range -73°C to +232°C ** This grease currently contains silicone (+) Guide Specification		Q * Operating temperature range -40°C to +121°C ** TU, Limited availability (+) Guide Specification	
	Q * operating temperature range -54°C to +93°C ** This grease currently contains silicone *** IT, Limited availability on Naval bases (+) Guide Specification			



TABLE 1

NATO Code		G-394 GREASE, AIRCRAFT: Silicone, pneumatic system	G-395 GREASE, AIRCRAFT: Multipurpose*	G-396 GREASE, AIRCRAFT: PTFE
AS		Def Stan 91-56/2 n/a/af	MIL-PRF-81322F Type 1 n/a/af	
BE		BA-PG-412A Type UK AF	BA-PG-414A Amd 1 n/a/AF	
CA			MIL-G-81322F n/AF	
CZ				
DA		Def Stan 91-56/2 AF	MIL-G-81322F n/a/AF	
FR			AIR 4222 Iss 1 n/a/AF	
GE		Def Stan 91-56/2 AF	MIL-PRF-81322F n/a/AF	MIL-G-83363B* AF
GR		Def Stan 91-56/1 AF	MIL-G-81322E n/a/AF	MIL-G-83363B AF
HU				
IT			AA M G 301 AF	
LU				
NL		Def Stan 91-56/2 n/AF	MIL-G-81322E n/a/AF	
NO		Def Stan 91/56/2 AF	Def Stan 91-52/1 Amd 1 AF	
NZ		Def Stan 91-56/2 AF	MIL-PRF-81322F Type 1 n/AF	
PL				
PO			MIL-PRF-81322F n/AF	MIL-G-83363B AF
SP			MIL-PRF-81322F n/a/AF	MIL-G-83363B n/a/AF
TU			MIL-G-81322E Grade A n/a/AF	
UK		Def Stan 91-56/2 (+) <b>XG-315</b> n/a/AF	Def Stan 91-52/1 Amd 1 <b>XG-293</b> n/a/AF	MIL-G-83363C* AF
US			MIL-PRF-81322F (+) N/a/af	MIL-G-83363C (+) n/AF
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR		G-361	
REMARKS	Q (+) Guide Specification	Q * Operating temperature range -54°C to +177°C (+) Guide Specification	Q *GE, UK, Limited availability (+) Guide Specification	

TABLE 1

NATO Code		G-397 GREASE, PERFLUORINATED, LOX COMPATIBLE	G-398 GREASE, PERFLUORINATED, LOX COMPATIBLE	G-399 GREASE, PERFLUORINATED, LOX COMPATIBLE
AS		MIL-PRF-27617F Type 1	MIL-PRF-27617F Type II	MIL-PRF-27617F Type III
			AF	AF
BE		MIL-G-27617E Type 1	MIL-G-27617E Type II	MIL-G-27617E Type III
		AF	AF	AF
CA		MIL-PRF-27617F Type 1	MIL-PRF-27617F Type II	MIL-PRF-27617F Type III
		n/AF	AF	n/a/AF
CZ				
DA		MIL-PRF-27617F Type 1	MIL-PRF-27617F Type II	MIL-PRF-27617F Type III
		AF	AF	a/AF
FR				
GE		MIL-PRF-27617F Type I		MIL-PRF-27617F Type III
		n/AF		n/AF
GR		MIL-PRF-27617F Type 1	MIL-PRF-27617F Type II	MIL-PRF-27617F Type III
		AF	AF	AF
HU				
IT		MIL-G-27617E Type 1	MIL-G-27617E Type II	MIL-G-27617E Type III
		AF	AF	AF
LU				
NL				MIL-PRF-27617F Type III
				n/AF
NO				MIL-PRF-27617F Type III
				n/(AF)
NZ		MIL-PRF-27617F Type 1	MIL-PRF-27617F Type II	MIL-PRF-27617F Type III
		AF	AF	AF
PL				
PO				MIL-PRF-27617F Type III
				AF
SP				MIL-PRF-27617F Type III
				a/AF
TU				MIL-G-27617E Amd 1 Type III
				n/a/AF
UK				
US		MIL-PRF-27617F (+) Type 1	MIL-PRF-27617F (+) Type II	MIL-PRF-27617F (+) Type III
		AF	AF	AF
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q See G-1350 for type IV (+) Guide Specification	Q See G-1350 for type IV (+) Guide Specification	Q See G-1350 for type IV (+) Guide Specification	Q See G-1350 for type IV (+) Guide Specification

TABLE 1

NATO Code		G-403 (7092) GREASE, AUTOMOTIVE AND ARTILLERY	G-408 GREASE, GRAPHITE SOFT	G-412 GREASE, GRAPHITE Medium
AS		Def Stan 91-27/2 n/A/af		Def Stan 91-18/2 n/A/af
BE			BT-PG-452 n/A/af	VV-G-671F A
CA		MIL-PRF-10924G A/af		
CZ				
DA			VV-G-671F (+) Grade 1 A	
FR				
GE				
GR		E/G-1303/b n/A/af	VV-G-671F* Grade 1 n/A/af	
HU				
IT		E/G-1303/b n/A/af	VV-G-671F Grade 1 A	
LU		BT-PG-453B Amd 1 A		
NL		MIL-G-10924F Amd 1 n/A/af		Def Stan 91-18/2 n/A/af
NO		MIL-PRF-10924G n/A/af		
NZ		Def Stan 91-27/2 AF		
PL				
PO		MIL-G-10924F Amd 1 A	VV-G-671F Grade 1 A	
SP		MIL-PRF-10924F n/A/af		VV-G-671F n/A/af
TU		MIL-G-10924D Amd 1 n/A/af	VV-G-671F Grade 1 n/A/af	VV-G-671F Grade 2 AF
UK		Def Stan 91-27/2 <b>XG-279</b> n/A/af		Def Stan 91-18/2 (+) <b>XG-264</b> n/A/af
US		MIL-PRF-10924G n/A/af		VV-G-671F n/A/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND	G-382, G-450	G-355	G-355
	AIR			
REMARKS	Q	Q * GR, Limited availability (+) Guide Specification	Q (+) Guide Specification	

**TABLE 1**

<b>NATO Code</b>		<b>G-414(7092)</b> GREASE: General Use (-30°C, +130°C)	<b>G-421(7092)</b> GREASE: General Use (-30°C, +150°C)	<b>G-450</b> GREASE NAVAL: General purpose, ball and roller bearing
AS				
BE		BT-PG-454 A/af		STM 7430/A Am 1 N
CA				
CZ				
DA				TL 9150-0067 Iss 3 N/af/a
FR		DCSEA 301/A Iss 2 Amd 1 n/A/af		STM 7430A Iss 2 Amd 2 (+) N
GE			TL9150-0075 Iss 2 n/A/af	
GR				Def Stan 91-28/1 N/a
HU				
IT				MIL-G-24139A N
LU				
NL				Def Stan 91-28/1 N/a/af
NO			TL9150-0075 Iss 1 n(A)	
NZ				
PL				
PO				STM 7430A Amd 1 N
SP		DCSEA 301/A Iss 2 n/A/af		Def Stan 91-28/1 N
TU				MIL-G-24139A n/a/AF
UK			Def Stan 91-105/1 <b>XG-291</b> N/a/af	
US				
AP	SEA			G-403
	LAND	G-403		
	AIR			
ES	SEA			G-382
	LAND	G-382	G-450	
	AIR			
REMARKS		Q	Q	Q (+) Guide Specification

**TABLE 1**

<b>NATO Code</b>		<b>G-460</b> GREASE, SEA WATER RESISTING	<b>G-1350</b> GREASE, PERFLUORINATED, LOX COMPATIBLE	<b>G-1352</b> GREASE: Multi-purpose, elevated temperature range
AS		Def Stan 91-34/1 Amd 2 n		
BE		STM 7420/B Amd 2 N	MIL-G-27617E Type IV AF	
CA			MIL-G-27617F Type IV n/AF	
CZ				
DA		Def Stan 91-34/1 Amd 2 N		
FR		STM 7420/B Iss 3 Amd 2 N		
GE		TL 9150-0066 Iss 3 N/a/af		
GR		Def Stan 91-34/1 N	MIL-G-2761E Type IV AF	
HU				
IT		Def Stan 91-34/1 Amd 2 N	MIL-G-27617E Type IV AF	
LU				
NL		Def Stan 91-34/1 Amd 2 N/a/af		
NO		TL 9150-0066 Iss 3 N		
NZ		Def Stan 91-34/1 N		
PL				
PO		STM 7420B Iss 1 Amd 2* N		
SP		STM 7420B Amd 2 N/a		
TU				
UK		Def Stan 91-34/2 <b>XG-286</b> N/a/af		Def Stan 91-106/1 <b>XG-294</b> n/AF
US			MIL-PRF-27617F (+) Type IV AF	
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q *PO, Limited availability	Q (+) Guide Specification		

TABLE 1

NATO Code		(+) H-515(3748) HYDRAULIC FLUID, PETROLEUM: Superclean	H-520 HYDRAULIC FLUID, PETROLEUM: Normal	H-536 HYDRAULIC FLUID, CHLORINATED SILICONE*
AS		MIL-H-5606G n/a/af		MIL-S-81087C Amd 1 af
BE		BA-PH-301/E Grade S n/a/AF	BA-PH-301/E* Grade N a/(AF)	MIL-S-81087C Amd 1** n/a/AF
CA		MIL-H-5606G n/a/AF		MIL-S-81087C Amd 1** AF
CZ				
DA		MIL-H-5606G n/a/AF		MIL-S-81087C Amd 1 n/AF
FR		DCSEA 415/A n/a/AF	DCSEA 415/A** AF	
GE		MIL-H-5606G n/a/AF		MIL-S-81087C Amd 1** n/AF
GR		MIL-H-5606F n/a/AF	Def Stan 91-48 Iss 2 AF	
HU				
IT		AA M O 261h n/a/AF		
LU				
NL		Def Stan 91-48/2 n/AF		MIL-S-81087C Amd 1 AF
NO		MIL-H-5606G n/AF		MIL-S-81087C Amd 1** n/(AF)
NZ		MIL-H-5606G AF		MIL-S-81087C Amd 1 AF
PL				
PO		MIL-H-5606G n/a/AF		
SP		MIL-H-5606G n/a/AF	Def Stan 91-48/1 Amd 1 AF	
TU		MIL-H-5606G n/a/AF		MIL-S-81087C Amd 1** n/(AF)
UK		Def Stan 91-48/2 * <b>OM-15</b> n/a/AF	Def Stan 91-48/2 <b>OM-18</b> a/AF	MIL-S-81087C Amd 1 <b>OX-50</b> n/AF
US		MIL-H-5606G*** n/a/AF		MIL-S-81087C Amd 1 (+) N/af
AP	SEA			
	LAND			
	AIR	C-635, H-520, H-537, H-544	H-515	
ES	SEA			
	LAND			
	AIR		C-635, H-537, H-544	
REMARKS	Q * H-537 is the only emergency substitute for UK aircraft ** H-537 and H-538 are preferred emergency substitutes for US aircraft *** C-635 used as last resort for US. Must be drained as soon as possible	Q * BE, Limited availability ** FR, No stock	Q * This fluid is at present only used in accessory equipment. Chlorinated silicone fluid is absolutely incompatible with C-635, H-515, H-520, H-537 and H-544 fluids **BE, CA, GE, NO, TU, Limited availability (+) Guide Specification	

TABLE 1

NATO Code		H-537(3748) HYDRAULIC FLUID, SYNTHETIC, FIRE RESISTANT	H-538 (3748) HYDRAULIC FLUID, LOW TEMPERATURE SYNTHETIC	H-540 HYDRAULIC FLUID, PETROLEUM
AS		MIL-PRF-83282D n/AF		
BE				BT-PH-354A Amd 1 A/af
CA		MIL-PRF-83282D Amd 1 a/AF		
CZ				
DA		MIL-PRF-83282D Amd 1* AF		TL 9150-0035 Iss 4 n/A/af
FR		DCSEA 437/A n/a/AF		
GE		MIL-PRF-83282D* Amd 1 n/AF	MIL-PRF-87257A* n/AF	TL 9150-0035 Iss 4 (+) n/A/af
GR		MIL-PRF-83282D Amd 1 AF		TL 9150-0035 Iss 3 A/af
HU				
IT		MIL-H-83282C* n/(AF)		
LU				
NL		MIL-PRF-83282D Amd 1 n/AF		TL 9150-0035 Iss 4 A/af
NO		MIL-PRF-83282D Amd 1 AF		
NZ		MIL-PRF-83282D* Amd 1 Amd int 1		
PL				
PO		MIL-PRF-83282D Amd 1 Amd int 1 AF		TL 9150-0035 Iss 3 A
SP		MIL-PRF-83282D Amd 1 n/a/AF		TL 9150-0035 Iss 3 A
TU		MIL-PRF-83282D Amd 1 Amd int 1 n/a/AF		
UK		MIL-PRF-83282D Amd 1 <b>OX-19</b> AF	MIL-PRF-87257A* <b>OX-538</b> n/AF	
US		MIL-PRF-83282D Amd 1 Amd int 1 N/a/af	MIL-PRF-87257A a/(AF)	
AP	SEA			
	LAND			
	AIR	H-515		
ES	SEA			
	LAND			H-515, H520, C-635
	AIR	C-635, H-515**, H-520**, H-538**, H-544	H-515**, H-537**	
REMARKS		Q * DA, GE, IT and NZ Limited availability ** H-515, H-520, H-538 are only emergency substitutes for US aircraft	Q * GE, UK, Limited availability ** Emergency substitutes for US only	Q (+) Guide specification

**TABLE 1**

<b>NATO Code</b>		<b>H-542 (7093)</b> BRAKE FLUID, AUTOMOTIVE: Polyglycol base	<b>H-544 (3748)</b> HYDRAULIC FLUID, SYNTHETIC: Less flammable	<b>H-547</b> BRAKE FLUID, SYNTHETIC: Silicone
AS		AS 1960-1983 Grade 3 n/A/af	MIL-PRF-46170C Type 1 AF	
BE		BT-PH-352B Amd 1 Type HB4 n/A/af		
CA		SAE J1703 Rev 91 Dot 4 n/A/af		MIL-B-46176A Amd 3 A
CZ				
DA		SAE J1703 Rev 91 Dot 4 n/A/af	MIL-H-46170B Amd 3 Type 1 A	
FR		DCSEA 402/A Iss 1 Dot 5.1 n/A/af		
GE		SAE J1703 Rev 91 Dot 4 n/A/af	MIL-H-46170B* Amd 3 Type 1 A	
GR		SAE J1703 Rev 91 Dot 4 n/A/af	MIL-H-46170B Amd 3 Type 1 A	
HU				
IT		E/L-1410/c n/A/af		
LU		BT-PH-352B Type HB4 A		
NL		Def Stan 91-81/2 n/A/af	MIL-H-46170B* Amd 3 Type 1 A	
NO		SAE J1703 Rev 91* Dot 4 n/(A)	MIL-H-46170B Amd 3 Type 1 A	MIL-B-46176A Amd 1 A/af
NZ				
PL				
PO		SAE J1703 Rev 91 Dot 4 n/A	MIL-H-46170B Amd 3 Type 1 A	MIL-B-46176A Amd 1 A
SP		SAE J1703 Rev 91 Dot 4 n/A/af	MIL-H-46170B Amd 3 Type 1 n/A/af	
TU		SAE J1703 Rev 91 Dot 4 n/A/af	MIL-H-46170B Amd 3 Type 1 n/A/af	MIL-B-46176A Amd 1 AF
UK		SAE J1704 Rev 00 Dot 4 <b>OX-8</b> n/A/af		
US		SAE J 1703 Rev 200010 n/A/af	MIL-PRF-46170C Type 1 A	MIL-PRF-46176B n/A
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND	H-547	H-537	H-542
	AIR			
REMARKS	Q *NO, Limited availability	Q *GE, NL, Limited availability	Q	



TABLE 1

NATO Code		H-548 (7093) AUTOMATIC TRANSMISSION FLUID	H-572 HYDRAULIC FLUID, PETROLEUM: Uninhibited	H-573 HYDRAULIC FLUID, PETROLEUM: Inhibited, ISO VG 46
AS			BS 4475: 1991 Grade CS-68 n/A/af	
BE			BS 4475: 1991* Grade CS-68 N/a/af	
CA				
CZ				
DA				MIL-PRF-17672D MS 2110 TH N
FR		DCSEA 403/B Level FZG12 n/A/af		STM 7220/B Iss 3 Amd 1 TH2 N
GE				
GR		DCSEA 403/A Iss 1 A		MIL-H-17672D Amd 3 MS 2110 TH N
HU				
IT				MM-H-3004/A Type II N
LU				
NL		STANAG 7093 A/af	BS 4475: 1991* Grade CS-68 N/af	
NO		STANAG 7093 A	BS 4475: 1991* Grade CS-68 N	TL 9150-0019 Iss 6 N
NZ			BS 4475: 1991* Grade CS-68 N	
PL				
PO			MP-L-208 N	STM7220/B Grade TH2 N
SP		STANAG 7093 n/A/af	BS 4475 n/A/af	MIL-PRF-17672E MS 2110 TH N/a/af
TU				MIL-PRF-17672D Amd 3 MS 2110 TH N/a/af
UK		STANAG 7093 <b>OX-75</b> n/A/af	BS 4475: 2000* (+) Grade CS-68 <b>OM-65</b> N	
US				MIL-PRF-17672D Amd 3 MS 2110 TH N/a/af
AP	SEA		H-573	
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS		Q	ISO-VG-68 * BE, NL, NO, UK, specify minimum VI of 95 is required (+) Guide Specification	Q * FR, Product contains antiwear additives

**TABLE 1**

NATO Code		H-574 HYDRAULIC FLUID: Antiwear	H-575 HYDRAULIC FLUID, PETROLEUM: Ordnance	H-576 HYDRAULIC FLUID, PETROLEUM: Antiwear ISO VG 32
AS			MIL-F-17111B OS N/a	Def Stan 91-39/2 n/a/af
BE	BN-PH-372 Iss B Amd 2 Type HM-46 N/a/af			BN-PH-372B Amd 1 Type HM-32 N
CA			MIL-DTL-17111C OS N/a	3-GP-36MbGr32* Grade 32 N/a/af
CZ				
DA			MIL-DTL-17111C OS N	
FR			MIL-F-17111B OS N	
GE	TL 9150-0019 Iss 6 N/a/af		MIL-DTL-17111C * OS N	
GR			MIL-F-17111B OS N	
HU				
IT			MIL-F-17111B OS N	
LU				
NL			MIL-DTL-17111C OS N	Def Stan 91-39/2 N/af
NO			MIL-DTL-17111C* OS N	Def Stan 91-39/2 N
NZ				Def Stan 91-39/1 Amd 1 N
PL				
PO			MIL-F-17111B* OS N	STM 7220/B Amd 1 TH1 low viscosity index N
SP			MIL-DTL-17111C OS N	
TU			MIL-F-17111B OS N	
UK				Def Stan 91-39/3 <b>OM-33</b> N/a/af
US			MIL-DTL-17111C (+) OS N/a	
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q	Q * GE, NO, PO, Limited availability High viscosity index (+) Guide Specification	Q *CA, may contain zinc	

**TABLE 1**

<b>NATO Code</b>		<b>H-579</b> HYDRAULIC FLUID, WATER GLYCOL: Fire resistant	<b>H-580</b> HYDRAULIC FLUID, PHOSPHATE ESTER: Fire resistant	<b>C-608</b> CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Concentrate
AS				MIL-C-6529C Type I a/af
BE				BA-PC-507A Type I AF
CA				MIL-C-6529C Amd 2 Type I AF
CZ				
DA				
FR		STM 7310/A* Iss 2 N	STM 7320A Iss 1 Amd 2 FHORI N	
GE				
GR				MIL-C-6529C Amd 2 Type I AF
HU				
IT				AER-M-I.386/c a/AF
LU				
NL			MIL-H-19457D* N	
NO				MIL-C-6529C Amd 2 Type I AF
NZ				
PL				
PO		STM 7310/A N		MIL-C-6529C Amd 2 Type I AF
SP		MIL-H-22072D N	MIL-H-19457D N	MIL-C-6529C Amd 2 Type I n/(AF)
TU		MIL-H-22072C N	MIL-H-19457D* N	MIL-C-6529C Amd 2 Type I a/AF
UK				MIL-C-6529C Amd 2* Type I <b>ZX-21</b> n/a/AF
US		MIL-H-22072C N	MIL-H-19457D* (+) N/a	MIL-C-6529C Amd 2 Type I (+) n/a/AF
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q * FR, Surface ships only	* NL, TU and US, Limited availability (+) Guide Specification	Q * UK, Limited availability (+) Guide Specification	

**TABLE 1**

<b>NATO Code</b>		<b>C-609</b> CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Piston	<b>C-610</b> CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Turbine	<b>C-613</b> CORROSION PREVENTIVE OIL, AIRCRAFT PISTON ENGINE: Static preservation, upper cylinder
AS		MIL-C-6529C Type II n/a/af	MIL-C-6529D Type III a	
BE		BA-PC-507A Type 2 AF	BA-PC-507A Type 3 AF	
CA		MIL-C-6529C Amd 2 Type II n/(AF)	MIL-C-6529C Amd 2 Type III n/AF	
CZ				
DA		MIL-C-6529C Amd 2 Type II AF		
FR			AIR 1504/B Iss 3 n/AF	
GE				
GR		MIL-C-6529C Amd 2 Type II n/AF	MIL-C-6529C Amd 2 Type III n/AF	
HU				
IT		AER-M-1.384/f n/a/AF	AER-M-I.385f n/a/AF	AM-I.382c a/AF
LU				
NL		MIL-C-6529C Amd 2 Type II AF	MIL-C-6529C Amd 2 Type III AF	
NO		MIL-C-6529C Amd 2 Type II AF	MIL-C-6529C Amd 2 Type III AF	DTD 791C AF
NZ		MIL-C-6529C Type II AF		DTD 791C AF
PL				
PO		MIL-C-6529C Amd 2 Type II AF	MIL-C-6529D Amd 2 Type III AF	
SP		MIL-C-6529C Amd 2 Type II n/(AF)	MIL-C-6529C Amd 2 Type III n/(AF)	
TU		MIL-C-6529C Amd 2 Type II a/AF	MIL-C-6529C Amd 2 Type III a/AF	
UK				DTD 791C (+) <b>PX-13</b> n/AF
US		MIL-C-6529C Amd 2 Type II (+) n/a/AF	MIL-C-6529C Amd 2 Type III (+) n/a/AF	
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q Combination of O-117 and C-608 (+) Guide Specification	Q Combination of O-133 and C-608 (+) Guide Specification	Q (+) Guide Specification	

**TABLE 1**

<b>NATO Code</b>		<b>C-614</b> CORROSION PREVENTIVE COMPOUND: Soft film, cold application	<b>C-615</b> CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Piston, metallic	<b>C-620</b> CORROSION PREVENTIVE COMPOUND: Soft film, cold application
AS				MIL-PRF-16173E Grade 2 n/a/af
BE				BA-PC-508A Grade 2 A/af
CA				MIL-PRF-16173E Grade 2 n/A/af
CZ				
DA			Def Stan 91-40/2 n/AF	MIL-PRF-16173E Grade 2 A/af
FR			AIR 1503/B Iss 3 n/AF	AIR 8132* Iss 1 n/A/af
GE				TL 8030-015 Iss 3 Type 2 n/A/af
GR			AIR1503/B Iss 3 Type A n/AF	MIL-PRF-16173E Grade 2 n/A/af
HU				
IT	AM-I.391c A/af	AER-M-I.381 AF		MIL-PRF-16173E Grade 2 A/af
LU				BA-PC-508A Grade 2 A
NL	DEF-2331A Amd 3 A/af			MIL-PRF-16173E Grade 2 n/(A)/af
NO		Def Stan 91-40/2 AF		
NZ	DEF-2331A Amd 3 AF	Def Stan 91-40/2 AF		MIL-PRF-16173E Grade 2 AF
PL				
PO	DEF-2331A Amd 3 (A)/af	Def Stan 91-40/2 AF		MIL-PRF-16173E Grade 2 (A)/af
SP				MIL-PRF-16173E Grade 2 n/(A)
TU				MIL-PRF-16173E Grade 2 A/af
UK	Def Stan 80-217/1 PX-1 n/A/af	Def Stan 91-40/2 (+) PX-27 n/a/AF		
US				MIL-PRF-16173E Grade 2 N/af
AP	SEA			
	LAND	C-620		C-614
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q	Q (+) Guide Specification		* FR, Qualification required

**TABLE 1**

<b>NATO Code</b>		<b>C-629</b> CORROSION PREVENTIVE COMPOUND: Hard film, cold application	<b>C-630</b> CORROSION PREVENTIVE SOLUBLE OIL: Thrust augmentation fluid	<b>C-632</b> CORROSION PREVENTIVE COMPOUND: Hard film, cold application
AS				MIL-PRF-16173E Grade 1 n/A/af
BE			BT-PC-553* Iss 0 a/(AF)	BA-PC-508A Grade 1 A/af
CA				MIL-PRF-16173E Grade 1 n/A/af
CZ				
DA				MIL-PRF-16173E Grade 1 A/af
FR	AIR 1502* Iss 1 n/A/af	AIR 8130 Iss 1 n/AF		
GE		TL 6850-0014 Iss 2 n/a/AF		TL 8030-015 Iss 3 Type 1 n/A/af
GR		MIL-C-4339C n/AF		MIL-PRF-16173E Grade 1 n/(A)/af
HU				
IT	AM-1.394d A/af			MIL-PRF-16173E Grade 1 A/af
LU				BA-PC-508A Grade 1 A
NL				MIL-PRF-16173E Grade 1 n/A/af
NO				
NZ				MIL-PRF-16173E Grade 1 N/AF
PL				
PO				MIL-PRF-16173E Grade 1 (A)/af
SP				MIL-PRF-16173E Grade 1 A
TU				MIL-PRF-16173E Grade 1 A/af
UK				
US			MIL-C-4339D (ASG) (+) n/AF	MIL-PRF-16173E Grade 1 N/af
AP	SEA			
	LAND	C-632		C-629
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	* FR, Qualification required	* BE, Qualification required (+) Guide Specification	Q	

TABLE 1

NATO Code		C-633 CORROSION PREVENTIVE Hard film, hot application	C-634 CORROSION PREVENTIVE Water displacing	C-635 (3748) CORROSION PREVENTIVE COMPOUND: Hydraulic system
AS		MIL-C-11796C Class 1 n/a/af	Def Stan 68-10/4 n/af	MIL-H-6083E Amd 3 n/a/af
BE			Def Stan 68-10/3 n/AF	BA-PC-504B Amd 1 a/AF
CA			Def Stan 68-10/3 n/a/AF	MIL-PRF-6083F AF
CZ				
DA		MIL-C-11796C Class 1 (A)/af	Def Stan 68-10/4 n/a/AF	MIL-PRF-6083F a/AF
FR			AIR 3634 Iss 1 n/AF	DCSEA 535/A n/a/AF
GE			Def Stan 68-10/4 n/a/AF	MIL-PRF-6083F n/a/AF
GR		MIL-C-11796C Class 1 (A)/af	Def Stan 68-10/3 n/(AF)	MIL-H-6083E Amd 2 n/a/AF
HU				
IT			Def Stan 68-10/4 AF	AA-M-I.389c a/AF
LU				
NL			Def Stan 68-10/4 n/AF	MIL-PRF-6083F n/a/AF
NO			Def Stan 68-10/4 n/(AF)	MIL-PRF-6083F n/AF
NZ			Def Stan 68-10/4 N/AF	MIL-H-6083E Amd 3 AF
PL				
PO		MIL-C-11796C Class 1 (A)/af	Def Stan 68-10/4 AF	MIL-PRF-6083F a/AF
SP		MIL-C-11796C Class 1 n/(A)		MIL-PRF-6083F n/a/AF
TU		MIL-C-11796C Class 1 A	Def Stan 68-10/1 n	MIL-PRF-6083F a/AF
UK			Def Stan 68-10/4 (+) <b>PX-24</b> n/A/af	Def Stan 80-142/1 <b>PX-26</b> a/AF
US		MIL-C-11796C (+) Class 1 N/af		MIL-PRF-6083F n/A/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			H-544
REMARKS	Q (+) Guide specification	Q (+) Guide specification	Q	

TABLE 1

NATO Code		C-638 CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Turbine, synthetic*	C-640 LUBRICATING OIL, ENGINE: Preservative, Grade 10	C-642 LUBRICATING OIL, ENGINE: Preservative, Grade 30
AS		MIL-C-8188C Amd 1 a/af		
BE			MIL-PRF-21260E* Grade 10 A	MIL-PRF-21260E Grade 30 (A)
CA		MIL-PRF-8188D n/AF	MIL-PRF-21260E Grade 10 A	MIL-PRF-21260E Grade 30 A
CZ				
DA			MIL-PRF-21260E Grade 10 n/(A)	MIL-PRF-21260E Grade 30 n/A/af
FR				DCEA 500/B Grade 15W/40 n/A/af
GE				
GR		MIL-C-8188C Amd 1 a/AF	MIL-L-21260D Amd 2 * Grade 10 n/A	MIL-L-21260D* Amd 2 Grade 30 n/A
HU				
IT		AM-I.387b n/AF	MIL-L-21260D Amd 2 Grade 10 A	MIL-L-21260D Amd 2 Grade 30 A
LU				
NL		MIL-C-8188C Amd 1 n/AF	MIL-L-21260D Amd 2 Grade 10 n/A/af	MIL-L-21260D Amd 2 Grade 30 n/A/af
NO		MIL-C-8188C Amd 1 AF	MIL-PRF-21260E * Grade 10 n/(A)	MIL-PRF-21260E* Grade 30 n/(A)
NZ		MIL-C-8188C Amd 1 AF		
PL				
PO		MIL-PRF-8188D AF	MIL-L-21260D Amd 2 Grade 10 A	MIL-L-21260D Amd 2 Grade 30 n/(A)
SP		MIL-PRF-8188D n/(AF)	MIL-PRF-21260E Grade 10 A	MIL-PRF-21260E Grade 30 A
TU		MIL-C-8188C Amd 1 a/AF	MIL-L-21260D Amd 2 Grade 10 (A)/af	MIL-L-21260D Amd 2 Grade 30 AF
UK				Def Stan 80-34/3 PX-4 n/A/af
US		MIL-PRF-8188D (+) a/AF	MIL-PRF-21260E (+) Grade 10 n/A/af	MIL-PRF-21260E (+) Grade 30 n/A/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q *For non-canned engines (+) Guide Specification	Q (+) Guide Specification * BE, GR, NO, Limited availability	Q (+) Guide Specification *GR, NO, Limited availability	



TABLE 1

NATO Code		S-712 COMPASS FLUID: Aircraft, petroleum	S-716 ANTISEIZE COMPOUND: Lead free	S-717 ANTISEIZE COMPOUND: Aircraft, oxygen system*
AS		MIL-L-5020C n/af	TT-S-1732 a	
BE		MIL-L-5020C AF		
CA		MIL-L-5020C n/AF		MIL-T-5542E M1 n/AF
CZ				
DA		MIL-L-5020C AF		
FR		MIL-L-5020C n/AF		
GE		MIL-L-5020C n/AF	TT-S-1732 n/a/AF	
GR		MIL-L-5020C n/AF	TT-S-1732 AF	MIL-T-5542E MI AF
HU				
IT		AA-M-L.441e Amd 1 AF	TT-S-1732 AF	AM-G.344 AF
LU				
NL		MIL-L-5020C n/(AF)	TT-S-1732 n/(A)F	
NO				MIL-T-5542E MI AF
NZ				MIL-T-5542E MI AF
PL				
PO		MIL-L-5020C AF	TT-S-1732 AF	MIL-T-5542E MI AF
SP		MIL-L-5020C AF		
TU		MIL-L-5020C AF	TT-S-1732 AF	MIL-T-5542E MI AF
UK				
US		MIL-L-5020C (+) n/AF		
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	(+) Guide Specification			Q * MIL-T-5542E (SH) is totally incompatible with MIL-T-5542E (MI) and is not an acceptable product for S-717

TABLE 1

NATO Code		S-718 ANTISEIZE COMPOUND: Aircraft, oxygen system	S-720 ANTISEIZE COMPOUND: Aircraft, graphite petrolatum	S-722 ANTISEIZE COMPOUND Molybdenum disulfide
AS		DTD 900/4042A	Def Stan 80-80/1 Amd 1 n/a/AF	Def Stan 80-81/2 n/a/af
BE			BA-PS-611A Amd 1 AF	BA-PS-622A a/AF
CA			SAE AMS-2518A n/a/AF	
CZ				
DA		DTD 900/4042A AF	Def Stan 80-80/2 n/AF	Def Stan 80-81/2 n/a/AF
FR			AIR 4247/A Iss 2 n/a/AF	
GE			SAE AMS-2518 n/a/AF	Def Stan 80-81/2 a/AF
GR			MIL-T-5544C AF	Def Stan 80-81/2 AF
HU				
IT			MIL-T-5544C a/AF	Def Stan 80-81/2 n/(AF)
LU				
NL			MIL-PRF-5544D n/a/AF	Def Stan 80-81/2 n/a/AF
NO		DTD 900/4042A AF	Def Stan 80-80/2 n/AF	Def Stan 80-81/2 n/AF
NZ		DTD 900/4042A AF	Def Stan 80-80/1 Amd 1 AF	Def Stan 80-81/2 AF
PL				
PO			SAE AMS-2518A AF	Def Stan 80-81/2 AF
SP			SAE AMS-2518A n/a/AF	Def Stan 80-81/2 n/AF
TU			MIL-T-5544C a/AF	
UK		DTD 900/4042A <b>ZX-24</b> n/AF	Def Stan 80-80/2 <b>ZX-13</b> n/a/AF	Def Stan 80-81/2 (+) <b>ZX-38</b> n/a/AF
US			SAE AMS-2518A n/(AF)	
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR	S-717*		
REMARKS	Q * Not to be used for pressures over 140 bars (2000 lbs per square inch)			Q (+) Guide Specification

TABLE 1

NATO Code		S-732 GRAPHITE POWDER, LUBRICATING	S-736 SILICONE COMPOUND: Electrical insulating	S-737 ISOPROPANOL, TECHNICAL
AS		SS-G-659a a	MIL-S-8660C Amd 1 n/a/af	BS1595 Amd 1 n/a/af
BE		SS-G-659/A n/a/AF	BA-PS-623A n/AF	BA-PS-604A AF
CA		SS-G-659/A n/a/AF	MIL-S-8660C Amd 1 a/AF	CGSB-GP525Ma n/a/AF
CZ				
DA			MIL-S-8660C Amd 1 n/a/AF	TT-I-735a Amd 3 Grade B AF
FR		AIR 4224 Iss 1 n/AF	Def Stan 68-69/1 n/a/AF	AIR 3660/A Iss 2 n/AF
GE		TL 9620-0001-3 n/a/AF	SAE AS 8660 n/a/AF	TL 6810-0002 Iss 4 n/a/AF
GR		SS-G-659/A Iss 1 AF	MIL-S-8660C Amd 1 n/AF	TT-I-735a Amd 3* Grade B AF/a
HU				
IT		SS-G-659/A* n/AF	MIL-S-8660C* Amd 1 n/AF	A-M-L.421d AF
LU				
NL		SS-G-659/A AF	MIL-S-8660C Amd 1 n/a/AF	TT-I-735a Amd 3 Grade B n/a/AF
NO		SS-G-659/A AF	MIL-S-8660C Amd 1 n/(AF)	
NZ		SS-G-659/A AF	Def Stan 68-69/1	BS 1595 Amd 1
PL				
PO			SAE AS 8660 n/AF	TT-I-735a Amd 3 Grade B n/AF
SP		SS-G-659/A n/AF	MIL-S-8660C Amd 1 n/(AF)	
TU		SS-G-659/A AF	MIL-S-8660C* Amd 1 AF	TT-I-735a Amd 3 Grade B AF
UK			Def Stan 68-69/1 (+) <b>XG-250</b> n/a/AF	BS 1595 Part 1: 1986 <b>AL-11</b> n/a/AF
US		SS-G-659/A (+) n/AF	SAE AS 8660 N/a/af	TT-I-735a Amd 3 (+) Grade B N/a/af
AP	SEA			
	LAND			
	AIR			S-738
ES	SEA			
	LAND			
	AIR			
REMARKS		* IT, Limited availability for the Navy (+) Guide Specification	Q IT, TU, Limited availability for the Navy (+) Guide Specification	* GR, Commercial quality (+) Guide Specification

TABLE 1

NATO Code		S-738 ETHANOL, DENATURED	S-740 MOLYBDENUM DISULFIDE POWDER, LUBRICATING	S-742 DE-ICING, DEFROSTING FLUID: Aircraft surfaces, ground use
AS		DEF (AUST) 5438 Amd 1 n/af	Def Stan 68-62/2** a/af	MIL-A-8243D Amd 1 Type II AF
BE		BA-PS-603A AF	MIL-M-7866C Amd 1 a/AF	
CA			MIL-M-7866C Amd 1 n/a/AF	CGSB-3-856M Amd 1 a/AF
CZ				
DA			MIL-M-7866C Amd 1 a/AF	MIL-A-8243D Amd 1 Type II AF
FR		AIR 3655 Iss 1 n/a/AF	AIR 4223 Iss 1 n/AF	MIL-A-8243D Amd 1 Type II AF
GE		TL 6810-0001 Iss 4 n/a/(AF)	TL 6810-0015 Iss 3 n/a/AF	
GR		O-E-00760D** Type III a/AF	MIL-M-7866C Amd 1 AF	MIL-A-8243D Amd 1 Type I I AF
HU				
IT		AA-M-L.422e*** n/AF	AA-M-G.376C n/a/AF	
LU				
NL		O-E-00760D Amd 2 Type III n/a/AF	MIL-M-7866C Amd 1 n/AF	MIL-A-8243D Amd 1 Type II AF
NO			MIL-M-7866C Amd 1* n/(AF)	MIL-A-8243D Amd 1 Type II AF
NZ			Def Stan 68-62/2 AF	MIL-A-8243D Amd 1 Type 11
PL				
PO		27CFR 21.35 Type III AF	SAE AMS-M-7866 AF	MIL-A-8243D Amd 1 Type II AF
SP		AIR 3655/ N/A/af	SAE AMS-M-7866 n/AF	MIL-L-8243D Amd 1 Type II n/(AF)
TU		O-E-00760C Amd 1 Type III AF	MIL-M-7866C Amd 1 AF	MIL-A-8243D Amd 1 Type II a/AF
UK			Def Stan 68-62/2 (+) <b>ZX-35</b> n/AF	
US		27CFR 21.35 Type III n/AF	SAE AMS-M-7866 N/af	MIL-A-8243D Amd 1 Type II (+) N/a/af
AP	SEA			
	LAND			
	AIR	S-737*		
ES	SEA			
	LAND			
	AIR			
REMARKS	* Not to be used in British compasses using ethanol as compass fluid ** GR, Commercial quality *** IT, Limited availability for the Navy		*NO, Limited availability **Modified for S <sub>2</sub> O <sub>2</sub> content (+) Guide Specification	(+) Guide Specification

TABLE 1

NATO Code		S-743 PETROLATUM, TECHNICAL	S-745 DE-ICING, DEFROSTING FLUID: Aircraft surfaces, in flight	S-746 ISOPROPYL NITRATE
AS			DTD 406B a/af	
BE	BA-PS-610A n/a/AF			
CA				
CZ				
DA	Def Stan 91-38/1 n/a/AF			
FR	AIR 3565/A Iss 2 n/a/AF	DTD 406B n/AF		
GE	TL 9150-0042/3 n/a/AF	TL 6850-0011/3 n/a/AF		
GR	VV-P-236a Amd 2 n/a/AF			
HU				
IT	AA-M-G.361d n/a/AF			
LU				
NL	Def Stan 91-38/1 n/a/AF			
NO	Def Stan 91-38/1 n/a/AF			
NZ	Def Stan 91-38/1 AF			
PL				
PO	VV-P-236a Amd 2 n/AF	DTD 406B AF		
SP	VV-P-236a Amd 2 n/AF			
TU	VV-P-236a Amd 2 n/a/AF			
UK	Def Stan 91-38/1 <b>PX-7</b> n/a/AF	DTD 406B (+) <b>AL-5</b> n/AF	Def Stan 91-89/1 (+) (DERD 2492) <b>AVPIN</b> AF	
US	VV-P-236a Amd 2 (+) n/a/AF			
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	(+) Guide Specification	(+) Guide Specification	(+) Guide Specification	

TABLE 1

NATO Code		S-747* METHANOL, TECHNICAL	S-749 LUBRICANT, SOLID FILM: Air drying	S-750 (7093) ANTIFREEZE: Automotive engine
AS		BS 506 Amd 1 AF	MIL-L-23398D Amd 2 a/af	
BE		BA-PS-608A a/AF	MIL-L-23398D Amd 2 n/AF	
CA		CGSB-QP-531M n/a/AF	MIL-L-23398D Amd 2 n/a/AF	CID-A-A 52624 n/A/af
CZ				
DA			MIL-L-23398D Amd 2 n/AF	MIL-A-46153C Amd 1 n/(A)
FR		AIR 3651/A Iss 2 (+) AF		
GE		TL 6810-0013 Iss 3 n/AF	MIL-L-23398D Amd 2 AF	
GR		OM 232/J Grade A AF	MIL-L-23398D Amd 2 n/AF	MIL-A-46153C Amd 1 n/A/af
HU				
IT		AA-M-L.430f** n/AF	MIL-L-23398D Amd 2 AF	
LU				
NL		O-M-232G Grade A n/(AF)	MIL-L-23398D Amd 2 n/AF	CID-A-A-52624 n/(A)
NO		O-M-232G Grade A AF	MIL-L-23398D Amd 2 n/AF	
NZ		BS 506 Amd 1 AF	MIL-L-23398D Amd 2 AF	
PL				
PO			MIL-L-23398D Amd 2 AF	CID-A-A-52624 A
SP		O-M-232K Grade A n/a/AF	MIL-L-23398D Amd 2 n/AF	CID-A-A-52624 n/A/af
TU		O-M-232G Grade A AF	MIL-L-23398D Amd 2 Type II n/AF	
UK		BS 506 Part 1: 1987 AL-14 a/AF	MIL-L-23398D Amd 2 ZX-55 n/a/AF	
US		O-M-232K Grade A n/A/af	MIL-L-23398D Amd 2 (+) n/a/AF	CID-A-A-52624 n/A/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			S-757, S-759
	AIR			
REMARKS		* Pure methanol only, consult appropriate T.O. for water purity for blends ** IT, Limited availability for the Navy (+) Guide Specification	(+) Guide Specification	

TABLE 1

NATO Code		S-752 DRY CLEANING SOLVENT: White spirit, flash point 38°C	S-753 DRY CLEANING SOLVENT: White spirit, flash point 65°C	S-756 INSULATING OIL: Electrical
AS		AS3530: 1988		
BE			BI-CC-1801 Iss 0 Amd 1 A/af	BT-PS-657A n/A/af
CA			MIL-PRF-680 Type II n/A/af	CSA C50-1976 n/A
CZ				
DA				BS 148: 1984 n/(A)/af
FR		DCSEA 602/B n/A/af		DCSEA 668/A Iss 2* n/A/af
GE		TL6810-0012 Iss 5 n/(A)/af		
GR		P-D-680B Amd 2* Type 1 n/A	P-D-680B Amd 2* Type II n/A	BS148:1984 n/(A)
HU				
IT				
LU				
NL		P-D-680B Amd 2 Type 1 n/(A)/af	P-D-680B Amd 2 Type II (A)/af	NEN 10296 Iss 1 Class 1A n/A/af
NO				BS 148: 1998 Class 1 n/(A)
NZ		P-D-680 Amd 2 Type 1 AF		
PL				
PO		MIL-PRF-680 A	MIL-PRF-680 Type II A	
SP		P-D-680B Amd 2 Type 1 n/A/af	A-A-50493 Type II n/A/af	BS148:1984 A
TU		P-D-680B Amd 2 Type 1 n/A/af	P-D-680B Amd 2 Type II n/A/af	
UK		BS 245: 1976 Type A <b>White Spirit</b> A/af		BS 148:1998 Class 1 <b>OM-16</b> n/A/af
US		MIL-PRF-680 (+) Type 1 n/A	MIL-PRF-680 (+) Type II n/A	
AP	SEA			
	LAND	S-753	S-752	
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS		(+) Guide Specification * GR, Limited availability	(+) Guide Specification * GR, Limited availability	* FR, Qualification required

TABLE 1

NATO Code		S-757 ANTIFREEZE, INHIBITED ETHANEDIOL	S-758 LUBRICANT, CLEANER AND PRESERVATIVE FOR WEAPONS	S-759 ANTIFREEZE: Automotive
AS			MIL-PRF-63460E n/A/af	
BE			BT-PS-661A n/A/af	BA-PS-606A Amd 2 n/A/af
CA			MIL-PRF-63460E n/A/af	
CZ				
DA			MIL-PRF-63460E (A)/af	
FR			DCSEA 501/A Iss 1 A/af	DSCEA 615/C n/A/af
GE				
GR			MIL-L-63460D Amd 4 n/A	
HU				
IT			MIL-PRF-63460E A	E/L-1415B Iss 1 n/A/af
LU				
NL	Def Stan 68-127/1 n/(A)		MIL-PRF-63460E Amd 4 n/A/af	
NO			FS 9150-0346 Iss 1 n/A/af	FS 6850-0951 Iss 1 n/A/af
NZ			MIL-PRF-63460E	
PL				
PO			DCSEA 501/A Iss 1 A	
SP	Def Stan 68-127/1 n/A/af		MIL-PRF-63460D A	
TU				
UK	Def Stan 68-127/1 <b>AL-39</b> n/A/af			
US			MIL-PRF-63460D Amd 6 (+) n/A/af	
AP	SEA			
	LAND		O-158*, O-190*	
	AIR			
ES	SEA			
	LAND	S-750, S-759	O-158, O-190	S-750, S-757
	AIR			
REMARKS			Q (+) Guide Specification * Except BE, NO	Q



**TABLE 1**

<b>NATO Code</b>		<b>S-760</b> WHITE SPIRIT Dry cleaning solvent low aromatics	<b>S-761</b> LUBRICATING OIL GENERAL PURPOSE Weapons Oils	<b>S-1712</b> DAMPING FLUIDS: Dimethyl silicone 3 cSt
AS				
BE		P-D-680B Amd 2 Type III n/A/af	TL 9150-0078 Iss 3 n/A/af	
CA				
CZ				
DA				Def Stan 91-46/2 Amd 1 AF
FR				
GE			TL 9150-0078 (+) Iss 3 n/A/af	
GR		P-D-680B Amd 2 Type III n/A/af		Def Stan 91-46/2 AF
HU				
IT				
LU				
NL		P-D-680B Type III n/(A)/af	TL 9150-0078 Iss 3 n/A/af	
NO				
NZ				
PL				
PO		MIL-PRF-680 A		
SP				Def Stan 91-46/2 a/AF
TU				
UK				Def Stan 91-46/2* (+) <b>ZX-41</b> (AF)
US		MIL-PRF-680 (+) Type III n/A/af		
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND		S-758	
	AIR			
REMARKS		Q (+) Guide specification	Q (+) Guide specification	Q * UK, Limited availability (+) Guide specification

TABLE 1

NATO Code		S-1714 DAMPING FLUIDS: Dimethyl silicone 10 cSt	S-1716 DAMPING FLUIDS: Dimethyl silicone 20 cSt	S-1718 DAMPING FLUIDS: Dimethyl silicone 50 cSt
AS			Def Stan 91-46/2 Amd 1 n/af	Def Stan 91-46/2 Amd 1 n/a/af
BE				
CA		VV-D-1078B n/AF		
CZ				
DA		VV-D-1078B* a/AF		VV-D-1078B AF
FR				
GE		VV-D-1078B AF	VV-D-1078B AF	VV-D-1078B AF
GR		VV-D-1078B AF	VV-D-1078B AF	VV-D-1078B AF
HU				
IT		VV-D-1078B n/(AF)	VV-D-1078B n/(AF)	VV-D-1078B n/(AF)
LU				
NL			VV-D-1078B n/(AF)	VV-D-1078B n/(AF)
NO				VV-D-1078B AF
NZ		Def Stan 91-46/2* AF		
PL				
PO		VV-D-1078B AF	VV-D-1078B AF	VV-D-1078B AF
SP		VV-D-1078B n/a/AF	VV-D-1078B n/a/AF	VV-D-1078B n/a/AF
TU		VV-D-1078B n/AF	VV-D-1078B n/AF	VV-D-1078B n/AF
UK		Def Stan 91-46/2* Amd 1 <b>ZX-42</b> (+) (AF)	Def Stan 91-46/2 Amd 1 <b>ZX-43</b> (+) n/AF	Def Stan 91-46/2 Amd 1 <b>ZX-44</b> (+) n/AF
US		VV-D-1078B N/af	VV-D-1078B N/af	VV-D-1078B N/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS		Q * DA, NZ, UK, Limited availability (+) Guide Specification	Q (+) Guide Specification	Q (+) Guide Specification

**TABLE 1**

<b>NATO Code</b>		<b>S-1720</b> DAMPING FLUIDS: Dimethyl silicone 100 cSt	<b>S-1724</b> DAMPING FLUIDS: Dimethyl silicone 7,500 cSt	<b>S-1726</b> DAMPING FLUIDS: Dimethyl silicone 20,000 cSt
AS		Def Stan 91-46/2 Amd 1 n/a/af	Def Stan 91-46/2 Amd 1 a/AF	
BE		VV-D-1078B AF	VV-D-1078B AF	VV-D-1078B AF
CA		VV-D-1078B n/AF		
CZ				
DA		VV-D-1078B a/AF		
FR				
GE		VV-D-1078B AF	VV-D-1078B AF	VV-D-1078B AF
GR		VV-D-1078B n/AF	VV-D-1078B AF	VV-D-1078B AF
HU				
IT		VV-D-1078B n/(AF)	VV-D-1078B n/(AF)	VV-D-1078B n/(AF)
LU				
NL		VV-D-1078B n/a/(AF)		
NO				
NZ		Def Stan 91-46/2* AF		
PL				
PO		VV-D-1078B AF	VV-D-1078B AF	
SP		VV-D-1078B n/a/AF	VV-D-1078B n/a/AF	VV-D-1078B n/a/AF
TU		VV-D-1078B n/AF	VV-D-1078B n/AF	
UK		Def Stan 91-46/2 Amd 1 <b>ZX-45 (+)</b> n/AF	Def Stan 91-46/2* Amd 1 <b>ZX-48 (+)</b> AF	Def Stan 91-46/2* Amd 1 <b>ZX-50 (+)</b> AF
US		VV-D-1078B N/af	VV-D-1078B N/af	VV-D-1078B N/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS		Q * NZ, Limited availability (+) Guide Specification	Q * UK, Limited availability (+) Guide Specification	Q * UK, Limited availability (+) Guide Specification

**TABLE 1**

<b>NATO Code</b>		<b>S-1728</b> DAMPING FLUIDS: Dimethyl silicone 100,000 cSt	<b>S-1732</b> DAMPING FLUIDS: Dimethyl silicone 200,000 cSt	<b>S-1735</b> MOLYBDENUM DISULFIDE LUBRICATING OIL: Silicone base
AS				DOD-L-25681 n/a/af
BE	VV-D-1078B AF	VV-D-1078B AF	DOD-L-25681D AF	
CA			DOD-L-25681D n/AF	
CZ				
DA			DOD-L-25681D AF	
FR				
GE	VV-D-1078B AF	VV-D-1078B AF	DOD-L-25681D n/AF	
GR	VV-D-1078B AF	VV-D-1078B AF	DOD-L-25681D n/AF	
HU				
IT	VV-D-1078B n/(AF)	VV-D-1078B n/(AF)	AA-M-0.246c n/a/AF	
LU				
NL			DOD-L-25681D n/a/AF	
NO				
NZ			DOD-L-25681D AF	
PL				
PO			DOD-L-25681D a/(AF)	
SP	VV-D-1078B n/a/AF	VV-D-1078B n/a/AF	DOD-L-25681D n/a/AF	
TU	VV-D-1078B AF		DOD-L-25681D n/a/AF	
UK	Def Stan 91-46/2 Amd 1 <b>ZX-52 (+)</b> AF	Def Stan 91-46/2 Amd 1 <b>ZX-53 (+)</b> AF	DOD-L-25681D <b>OX-70</b> AF	
US	VV-D-1078B N/af	VV-D-1078B N/af	DOD-L-25681D (+) n/AF	
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	Q (+) Guide Specification	Q (+) Guide Specification	(+) Guide Specification	

**TABLE 1**

<b>NATO Code</b>		<b>S-1736</b> ANTISEIZE TAPE: Aircraft oxygen system	<b>S-1737</b> LUBRICANT, SOLID FILM: Extreme environment	<b>S-1738</b> LUBRICANT, SOLID FILM: Heat cured
AS		MIL-T-27730A (ASG) n/af		MIL-L-46010D Type I n/a/af
BE				MIL-L-46010D Type I AF
CA		MIL-T-27730A (ASG) n/a/AF		MIL-L-46010D Type I AF
CZ				
DA				
FR				
GE		CID-A-A-58092 (ASG) n/a/AF		SAE AS5272 Type I n/a/AF
GR		MIL-T-27730A (ASG) AF	MIL-L-81329C Amd 1 AF	MIL-L-46010D AF
HU				
IT			MIL-L-81329C Amd 1 AF	MIL-L-46010D Type I AF
LU				
NL		MIL-T-27730A (ASG) n/AF	MIL-L-81329C Amd 1 AF	MIL-L-46010E Type I n/AF
NO		MIL-T-27730A (ASG) AF	MIL-L-81329C Amd 1 AF	
NZ		MIL-T-27730A (ASG) AF		MIL-L-8937D Amd 2 Type I AF
PL				
PO			MIL-PRF-81329D Amd 1 AF	MIL-L-46010E Type I AF
SP			MIL-PRF-81329D Amd 1 AF	MIL-L-46010E Type I AF
TU			MIL-L-81329C Amd 1 AF	MIL-L-46010D Type I n/a/AF
UK				SAE AS5272 Iss 1997 Type I <b>ZX-34</b> AF
US		A-A-58092 (ASG) (+) n/AF	MIL-PRF-81329D Amd 1 (+) N/af	MIL-PRF-46010F Type III n/A/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS	(+) Guide Specification	Q (+) Guide Specification	Q	

TABLE 1

NATO Code		S-1739 WATER, THRUST AUGMENTATION: Demineralized	S-1744 METHANOL/WATER: 44/56	S-1745 FUEL SYSTEM ICING INHIBITOR: High flash type
AS			Def Stan 68-253/1 (DERD 2491) a/af	Def Stan 68-252/1 (DERD 2451) n/a/af
BE			BA-PS-609A AF	BA-PS-619E Type 2 n/a/AF
CA				ASTM D4171 Type III n(AF)
CZ				
DA			Def Stan 68-253/1 (DERD 2491) AF	MIL-I-85470 A* n/AF
FR			AIR 3651/A Iss 2 Type 44/56 n/AF	DCSEA 745/A* n(AF)
GE			TL 6810-0030 Iss 1 n/AF	MIL-DTL-85470B* n(AF)
GR		Def Stan 68-253/1 AF	Def Stan 68-253/1 AF	MIL-I-85470A AF
HU				
IT			AA-M-L.432 AF	
LU				
NL		TVA 6810/2/7/003 n/a(AF)	Def Stan 68-253/1 n/AF	MIL-I-85470A AF
NO				MIL-DTL-85470B n/AF
NZ		Proprietary N	Def Stan 68-253/1 AF	Def Stan 68-252/1 AF
PL				
PO				MIL-DTL-85470B AF
SP		Def Stan 68-253/1 n/AF	Def Stan 68-253/1 Type 44/56 AF	MIL-DTL-85470B n/a/AF
TU				
UK		Def Stan 68-253/1 (DERD 2491) <b>WTA</b> AF	Def Stan 68-253/1 (+) (DERD 2491) <b>AL-28</b> AF	Def Stan 68-252/2 (DERD 2451) <b>AL-41</b> n/AF
US				MIL-DTL-85470B (+) N/a/af
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS			(+) Guide Specification	* DA, FR, GE, Limited availability (+) Guide Specification

**TABLE 1**

<b>NATO Code</b>		<b>S-1746</b> DEICING, DEFROSTING FLUID: Aircraft surfaces, ground use	<b>S-1747</b> CORROSION INHIBITOR	<b>S-1748</b> COOLANT FLUID HYDROLYTICALLY STABLE DIELECTRIC
AS				
BE		DTD 900/4907 Iss 1 AF	BA-PS-624 Iss B Amd 1 n/a/AF	
CA			MIL-PRF-25017F n/a/AF	MIL-PRF-87252C AF
CZ				
DA				
FR				
GE			MIL-I-25017E* n/a/AF	MIL-C-87252B AF
GR		DTD 900/4907 Iss 1 AF	MIL-I-25017E AF	
HU				
IT				
LU				
NL		DTD 900/4907 Iss 1 n(AF)	MIL-PRF-25017F n/AF	MIL-PRF-87252C AF
NO			MIL-PRF-25017F AF	
NZ				
PL				
PO			MIL-PRF-25017F AF	
SP				
TU				
UK		DTD 900/4907 <b>AL-34</b> a/AF	Def Stan 68-251/2 (DERD 2461) <b>AL-61</b> n/a/AF	
US			MIL-PRF-25017F n/a/AF	MIL-PRF-87252C (+) AF
AP	SEA			
	LAND			
	AIR			
ES	SEA			
	LAND			
	AIR			
REMARKS			Only those products listed in STANAG 3390 are approved. *GE, Limited availability	Q (+) Guide Specification

**TABLE 1**

<b>NATO Code</b>		<b>S-1749</b> JET FUEL THERMAL STABILITY ADDITIVE (+100)	<b>S-1750</b> MULTI-PURPOSE ADDITIVE: DIESEL ENGINE	<b>S-1751</b> BIOCIDE ADDITIVE FOR FUELS
AS				
BE			DCSEA 751* Iss 1 A	DCSEA 754* Iss 1 n/a/AF
CA				
CZ				
DA				
FR			DCSEA 751 Iss 1 (+) n/A/af	DCSEA 754 Iss 1 (+) n/a/AF
GE				
GR				
HU				
IT				
LU				
NL			DCSEA 751** Iss 1 (A)/af	DCSEA 754* Iss 1 AF
NO			DCSEA 751* Iss 1 A	
NZ				
PL				
PO				DCSEA 754 Iss 1 AF
SP				
TU				
UK				
US		MIL-DTL-83133E AF		
AP	SEA			
	LAND			
	AIR	F-34		
ES	SEA			
	LAND			
	AIR	F-35		
REMARKS			Q * BE, NO, No stocks ** NL, Limited availability (+) Guide Specification	Q * BE, NL, No stocks (+) Guide Specification



**TABLE 2**

**Minimum Frequency for Re-inspection of Products**

Minimum Frequency, in months, for the re-inspection of the packaged or dormant products listed in this Standard are shown below. The test periods for products bearing a NATO Code are those shown in STANAG 3149, minimum quality surveillance of petroleum products. The frequencies quoted are a minimum and individual Services may shorten the re-inspection period if the material is being stored under adverse conditions or if the material is known to be deteriorating.

Dormant stocks are stocks of products held in bulk of which there have been no receipts during the period concerned, irrespective of whether there have been any issues during the same period.

Active and dormant fuel stocks in non-permanent or mobile storage installations including Tanks Fabric Collapsible (TFC), Air Portable Fuel Containers (APFC), Refuellers, Tankers and Unit Bulk Refuelling Equipment (UBRE) shall also be re-inspected but the frequency should be half those detailed below.

Joint Service Designation	NATO Code	Visual Test Frequency	Re-inspection Frequency	Remarks
AL-5	S-745	12	24	36 in Bulk
AL-11	S-737	12	48	
AL-14	S-747	12	48	
AL-20	-	12	36	
AL-26	-	12	24	
AL-28	S-1744	6	24	
AL-34	S-1746	12	24	
AL-36	-	12	24	
AL-39	S-757	12	48	
AL-40	-	12	36	
AL-41	S-1745	-	18	
AL-48	-	-	6	
AL-61	S-1747	-	36	
OC-160	O-254	12	60	
OC-300	-	12	36	
OC-600	O-208	12	36	
OEP-30	O-153	12	48	
OEP-38	O-186	12	48	
OEP-70	O-155	12	48	
OEP-71	O-136	12	48	
OEP-80	-	12	60	
OEP-215	-	12	36	
OEP-220	O-226	12	48	
OEP-230	-	12	36	
OEP-240	-	12	36	
OEP-250	-	12	36	
OM-11	O-135	12	48	
OM-12	O-142	12	48	
OM-13	O-134	12	48	
OM-15	H-515	12	24	
OM-16	S-756	-	48	
OM-17	-	12	48	
OM-18	H-520	12	36	
OM-22	-	-	12	

**TABLE 2**

Joint Service Designation	NATO Code	Visual Test Frequency	Retest Frequency	Remarks
OM-24	—	12	60	36 in Bulk
OM-33	H-576	12	60	36 in Bulk
OM-58	—	12	48	
OM-65	H-572	12	60	36 in Bulk
OM-70	O-285	12	60	36 in Bulk
OM-71	O-138	12	48	
OM-100	O-240	12	60	36 in Bulk
OM-150	—	12	48	
OM-160	—	12	48	
OM-170	—	12	48	
OM-270	—	12	48	
OM-750	O-252	12	60	36 in Bulk
OM-1300	O-258	12	60	36 in Bulk
OMD-23	—	—	36	
OMD-55	O-1178	12	36	
OMD-90	O-1176	12	48	
OMD-113	O-278	12	60	36 in Bulk
OMD-140	—	12	36	
OMD-160	—	12	48	
OMD-162	—	12	48	
OMD-250	—	12	48	
OMD-330	—	12	36	
OMD-370	—	12	48	
OX-7	—	12	48	
OX-8	H-542	12	48	
OX-9	O-148	12	48	
OX-14	O-147	12	48	
OX-16	—	12	48	
OX-18	O-190	12	48	
OX-19	H-537	12	24	
OX-20	—	12	36	
OX-22	—	12	48	
OX-24	O-157	12	48	
OX-26	O-160	12	48	
OX-27	O-156	12	48	
OX-28	—	12	48	
OX-29	—	12	60	36 in Bulk
OX-30	—	12	60	36 in Bulk
OX-38	O-149	12	48	
OX-40	—	12	60	
OX-50	H-536	12	36	
OX-70	S-1735	12	—	
OX-72	—	12	60	36 in Bulk
OX-75	H-548	12	48	
OX-79	—	12	36	
OX-80	—	12	36	
OX-85	—	12	36	

**TABLE 2**

Joint Service Designation	NATO Code	Visual Test Frequency	Retest Frequency	Remarks
OX-87	-	12	60	36 in Bulk
OX-95	-	-	36	
OX-125	-	12	36	
OX-165	-	-	36	
OX-300	-	12	60	
OX-538	H-538	12	24	
PX-1	C-614	12	48	
PX-4	C-642	12	48	
PX-6	-	-	48	
PX-7	S-743	12	48	
PX-11	C-628	12	48	
PX-13	C-613	-	36	
PX-15	-	-	48	
PX-19	-	-	48	
PX-24	C-634	-	48	
PX-26	C-635	-	48	
PX-27	C-615	-	36	
PX-28	-	-	48	
PX-31	-	-	48	
PX-32	-	-	48	
PX-36	-	-	36	
XG-235	G-363	6	36	
XG-250	S-736	12	36	
XG-261	-	12	36	
XG-264	G-412	12	24	
XG-269	G-392	12	36	
XG-271	G-382	12	36	
XG-273	-	-	36	
XG-276	G-353	12	36	
XG-279	G-403	12	36	
XG-284	G-366	12	36	
XG-285	G-355	12	36	
XG-286	G-460	12	48	
XG-287	G-354	12	36	
XG-291	G-421	12	36	
XG-293	G-395	12	36	
XG-294	G-1352	12	36	
XG-300	G-372	12	36	
XG-305	-	12	36	
XG-315	G-394	12	36	
XG-344	-	-	36	
XG-380	-	12	36	
XG-460	-	12	36	
ZX-9	-	-	48	
ZX-13	S-720	12	48	

**TABLE 2**

Joint Service Designation	NATO Code	Visual Test Frequency	Retest Frequency	Remarks
ZX-21	C-608	36	–	
ZX-24	S-718	12	–	
ZX-30	–	12	36	
ZX-34	S-1738	12	12	
ZX-35	S-740	12	48	
ZX-36	–	12	48	
ZX-38	S-722	12	36	
ZX-40	–	12	60	
ZX-41	S-1712	12	60	
ZX-42	S-1714	12	60	
ZX-43	S-1716	12	60	
ZX-44	S-1718	12	60	
ZX-45	S-1720	12	60	
ZX-46	–	12	60	
ZX-47	–	12	60	
ZX-48	S-1724	12	60	
ZX-49	–	12	60	
ZX-50	S-1726	12	60	
ZX-51	–	12	60	
ZX-52	S-1728	12	60	
ZX-53	S-1732	12	60	
ZX-54	–	–	48	Aerosols, 12 months visual check
ZX-55	S-749	6	24	

**TABLE 2**

Joint Service Designation	NATO Code	Visual Test Frequency	Retest Frequency	Remarks
AVGAS 100LL	—	—	6	
AVCAT FSII	F-44	—	12	FSII check at 6 months
AVPIN	S-746	12	24	
AVTUR	F-35	—	12	
AVTUR/FSII	F-34	—	12	FSII check at 6 months
MTGAS	F-57	—	12	
ULGAS	F-67	—	12	
DIESO MILITARY	F-54	—	12	
DIESO UK	—	—	12	
DIESO MT	—	—	12	
DIESO F-76	F-76	12	12	
			(Arctic 36)	
3/50 FFO	—	—	36	
36/50 FFO	—	—	36	
125/50 FFO	—	—	36	
370/50 FFO	—	—	36	
KERO/A	—	—	12	
KERO/B	F-58	—	12	
STOVE NAPHTHA	—	—	12	
WHITE SPIRIT	S-752	12	48	
WTA	S-1739	6	24	

**TABLE 3**

**Specifications used by the United Kingdom.**

For Standardized Alternatives which have NATO Codes, see Table 1

Specification	Page	Joint Service Designation	NATO Code	Remarks	
<b>BS</b>					
148	56	OM-16	S-756	Type A, Grade 68	
148	59	OM-22	-		
245	188	WHITE SPIRIT	S-752		
506	176	AL-14	S-747		
1595	175	AL-11	S-737		
2626	64	OM-70	O-285		
2869	203	DIESO UK	-		
2869	208	3/50 FFO	-		
2869	209	36/50 FFO	-		
2869	210	125/50 FFO	-		
2869	211	370/50 FFO	-		
2869	214	KERO/A	-		
2869	215	KERO/B	F-58		
4475	60	OM-24	-		
4475	63	OM-65	H-572		
4475	71	OM-750	O-252		
4475	72	OM-1300	O-258		
EN228	197	ULGAS	F-67		
EN590	200	DIESO MILITARY	F-54		
EN590	204	DIESO MT	-		
<b>Def Stan</b>					
68-10	166	PX-24	C-634		
68-61	178	AL-26	-		
68-62	148	ZX-35	S-740		
68-69	119	XG-250	S-736		
68-108	177	AL-20	-		
68-127	182	AL-39	S-757		
68-129	183	AL-40	-		
68-150	185	AL-48	-		
68-251	186	AL-61	S-1747		
80-34	159	PX-4	C-642		
80-80	143	ZX-13	S-720		
80-81	150	ZX-38	S-722		
80-83	171	PX-32	-		
80-85	162	PX-11	C-628		
80-145	164	PX-15	-		
80-217	158	PX-1	C-614		
91-4	205	DIESO F-76	F-76		
91-6	118	XG-235	G-363		
91-12	123	XG-271	G-382		

TABLE 3

Specification	Page	Joint Service Designation	NATO Code	Remarks
<b>Def Stan</b>				
91-18	121	XG-264	G-412	
91-21	36	OC-160	O-254	
91-22	77	OMD-113	O-278	
91-25	66	OM-100	O-240	
91-27	126	XG-279	G-403	
91-34	129	XG-286	G-460	
91-35	100	OX-30	-	
91-36	57	OM-17	-	
91-38	160	PX-6	-	
91-38	161	PX-7	S-743	
91-39	61	OM-33	H-576	
91-40	168	PX-27	C-615	
91-42	62	OM-58	-	
91-42	68	OM-160	-	
91-43	83	OMD-330	-	
91-44	54	OM-13	O-134	
91-46	152/153	ZX-41	S-1712	
91-46	152/153	ZX-42	S-1714	
91-46	152/153	ZX-43	S-1716	
91-46	152/153	ZX-44	S-1718	
91-46	152/153	ZX-45	S-1720	
91-46	152/153	ZX-46	-	
91-46	152/153	ZX-47	-	
91-46	152/153	ZX-48	S-1724	
91-46	152/153	ZX-49	-	
91-46	152/153	ZX-50	S-1726	
91-46	152/153	ZX-51	-	
91-46	152/153	ZX-52	S-1728	
91-47	53	OM-12	O-142	
91-48	55	OM-15	H-515	
91-48	58	OM-18	H-520	
91-49	89	OX-14	O-147	
91-51	127	XG-284	G-366	
91-52	132	XG-293	G-395	
91-53	130	XG-287	G-354	
91-54	128	XG-285	G-355	
91-56	136	XG-315	G-394	
91-57	125	XG-276	G-353	
91-59	41	OEP-38	O-186	
	46	OEP-220	O-226	
91-64	135	XG-305	-	
91-65	37	OC-300	-	
	38	OC-600	O-208	

**TABLE 3**

Specification	Page	Joint Service Designation	NATO Code	Remarks
<b>Def Stan</b>				
91-68	75	OMD-55	O-1178	
91-69	112	OX-125	-	
91-70	142	ZX-9	-	
91-71	113	OX-165	-	
91-72	154	ZX-54	-	
91-74	44	OEP-80	-	
91-78	165	PX-19	-	
91-79	91	OX-18	O-190	
91-85	124	XG-273	-	
91-86	193	AVCAT FSII	F-44	
91-87	196	AVTUR FSII	F-34	
91-88	192	AVTAG FSII	F-40	
91-89	194	AVPIN	S-746	
91-90	190	AVGAS 100LL	-	
91-91	195	AVTUR	F-35	
91-93	94	OX-22	O-291	
91-94	86	OX-7	-	
91-97	43	OEP-71	O-136	
	57	OM-71	O-138	
91-98	101	OX-38	O-149	
91-99	52	OM-11	O-135	
91-100	96	OX-26	O-160	
91-101	97	OX-27	O-156	
	98	OX-28	-	
91-102	95	OX-24	O-157	
91-103	172	PX-36	-	
91-104	74	OMD-23	-	
91-105	131	XG-291	G-421	
91-106	133	XG-294	G-1352	
91-110	102	OX-40	-	
91-111	138	XG-380		
91-112	40	OEP-30	O-153	
91-112	42	OEP-70	O-155	
91-113	76	OMD-90	O-1176	
<b>DTD</b>				
406	174	AL-5	S-745	
417	67	OM-150	-	
791	163	PX-13	C-613	



**TABLE 3**

Specification	Page	Joint Service Designation	NATO Code	Remarks
<b>DTD 900</b>				
4042	145	ZX-24	S-718	
4386	90	OX-16	-	
4639	146	ZX-30	-	
4872	137	XG-344	-	
4877	149	ZX-36	-	
4881	93	OX-20	-	
4907	180	AL-34	S-1746	
4939	181	AL-36	-	
4981	45	OEP-215	-	
6103	110	OX-87	-	
<b>MIL/DOD</b>				
C-6529	144	ZX-21	C-608	
G-25013	134	XG-300	G-372	
L-23398	155	ZX-55	S-749	
L-25681	106	OX-70	S-1735	
PRF-7808	88	OX-9	O-148	
PRF-83282	92	OX-19	H-537	
PRF-87257	115	OX-538	H-538	
S-81087	103	OX-50	H-536	
<b>Proprietary</b>				
AFS 990C	120	XG-261	-	
Caterpillar TO-4	107, 108	OX-79, OX-80		
Detroit Diesel 7SE 270	78	OMD-140	-	
Ford ESEN - M2C 86B and M-F CMS M1135	109	OX-85		
GM 6417M	106	OX-75	H-548	
<b>STANAG</b>				
7090	198	MTGAS	F-57	
7093	106	OX-75	H-548	

**TABLE 3**

Specification	Page	Joint Service Designation	NATO Code	Remarks
<b>SAE</b>				
J 1899	79	OMD-160	—	
J 1899	80	OMD-162	—	
J 1899	81	OMD-250	—	
J 1899	83	OMD-370	—	
J 1966	69	OM-170	—	
J 1966	70	OM-270	—	
J 1704	87	OX-8	H-542	
75W-80	47	OEP-230	—	
80W-90; 90	49	OEP-240	—	
80W-140	50	OEP-250	—	
AMS-G-4343	122	XG-269	G-392	
AS 5272	147	ZX-34	S-1738	
<b>Other UK specifications</b>				
UK Mineral Hydrocarbons in Food (SI 1966/1073)	57	OM-17	—	

**TABLE 4**

**IP Flash Point Classification of Products**

The products listed in the Table are classified according to their closed flash point. The Institute of Petroleum flash points are as follows:

CLASS I	:	Products having a flash point below 21°C.
CLASS II	:	Products having a flash point from 21°C to 55°C, inclusive.
CLASS III	:	Products having a flash point above 55°C up to and including 100°C.
UNCLASSIFIED	:	uc -- IP and UN products having a flash point above 100°C.

These classes are based on the Institute of Petroleum's 'Classification for Petroleum and its Products', reflecting both the metrication of the UK oil industry and the UK's membership of the EEC.

**UN Dangerous Goods Classifications**

Hazardous substances and articles are classified, by suppliers, according to their main characteristics and properties that may adversely affect health, environment and property. There are two classification methods used:

- a. CHIP which is designed to warn people of the hazards presented by chemical substances and preparations by identifying the hazard(s) and providing adequate safety information in the form of "supply labels" and SDS.
- b. United Nations (UN) which identifies the hazards presented by dangerous chemicals, equipment and articles during transport operations. Under this system Dangerous Goods (DG) are classified into nine hazard classes and are assigned packaging, marking, labelling, placarding, documentation and segregation requirements relevant to the mode(s) of transport used.

The UN numbers quoted in this table are a guide for carriage purposes only. The relevant transport regulations shall be consulted (see page 14) for the current requirements.

**United Nations Classification Criteria for Flammable Liquids (UN Class 3)**

1. Flammable liquids are liquids, or mixture of liquids or liquids containing solids in solution or suspension, which give off a flammable vapour at temperatures of not more than 65.6°C open cup test.
2. Flammable liquids have been assigned to three Packaging Groups according to the degree of danger they present.

Packaging Group I - Great danger (Extremely Flammable).

Packaging Group II - Medium danger (Highly Flammable).

Packaging Group III - Low danger (Flammable)

3. Flammable liquids are grouped according to their flashpoint and boiling point. The table below shows the UN Packaging Group based on flammability.

Packaging Group	Flashpoint in °C	Initial Boiling Point °C
I	-	= 35
II	< 23	> 35
III	= 23 – = 60.5	> 35

Joint Service Designation	NATO Code	IP Class	UN No	Joint Service Designation	NATO Code	IP Class	UN No
AL-5	S-745	III	na	OM-100	O-240	uc	na
AL-11	S-737	I	1219	OM-150	--	uc	na
AL-14	S-747	I	1230	OM-160	--	uc	na
AL-20	--	uc	na	OM-170	--	uc	na
AL-26	--	uc	na	OM-270	--	uc	na
AL-28	S-1744	II	1230	OM-750	O-252	uc	na
AL-34	S-1746	uc	na	OM-1300	O-258	uc	na
AL-36	--	uc	na	OMD-23	O-1177	III	na
AL-39	S-757	uc	na	OMD-55	O-1178	uc	na
AL-40	--	I	1230	OMD-90	O-1176	uc	na
AL-41	S-1745	III	na	OMD-113	O-278	uc	na
AL-48	--	uc	na	OMD-140	--	uc	na
AL-61	S-1747	uc	3082	OMD-160	--	uc	na
OC-160	O-254	uc	na	OMD-162	--	uc	na
OC-300	--	uc	na	OMD-250	--	uc	na
OC-600	O-208	uc	na	OMD-330	--	uc	na
OEP-30	O-153	uc	na	OMD-370	--	uc	na
OEP-38	O-186	uc	na	OX-7	--	uc	na
OEP-70	O-155	uc	na	OX-8	H-542	III	na
OEP-71	O-136	uc	na	OX-9	O-148	uc	na
OEP-80	--	uc	na	OX-14	O-147	uc	na
OEP-215	--	uc	na	OX-16	--	uc	na
OEP-220	O-226	uc	na	OX-18	O-190	uc	na
OEP-230	--	uc	na	OX-19	H-537	uc	na
OEP-240	--	uc	na	OX-20	--	uc	na
OEP-250	--	uc	na	OX-22	--	uc	na
OM-11	O-135	uc	na	OX-24	O-157	uc	na
OM-12	O-142	uc	na	OX-26	O-160	uc	na
OM-13	O-134	uc	na	OX-27	O-156	uc	na
OM-15	O-515	III	na	OX-28	--	uc	na
OM-16	S-756	uc	na	OX-29	--	uc	na
OM-17	--	uc	na	OX-38	O-149	uc	na
OM-18	H-520	III	na	OX-40	--	uc	na
OM-22	--	uc	na	OX-50	H-536	uc	na
OM-24	--	uc	na	OX-70	S-1735	uc	na
OM-33	H-576	uc	na	OX-72	--	uc	na
OM-58	--	uc	na	OX-75	H-548	uc	na
OM-65	H-572	uc	na	OX-79	--	uc	na
OM-70	O-285	uc	na	OX-80	--	uc	na
OM-71	O-138	uc	na	OX-85	--	uc	na

Joint Service Designation	NATO Code	IP Class	UN No
OX-87	--	uc	na
OX-95	--	uc	na
OX-125	--	uc	na
OX-165	--	uc	na
OX-300	--	uc	na
OX-538	H-538	uc	na
PX-1	C-164	II	1993
PX-4	C-642	uc	1564
PX-6	--	uc	na
PX-7	S-743	uc	na
PX-11	C-628	uc	na
PX-13	C-613	I	1268
PX-15	--	uc	na
PX-19	--	uc	na
PX-24	C-634	II	1268
PX-26	C-635	III	na
PX-27	C-615	uc	na
PX-28	--	II	1993
PX-31	--	II	1993
PX-32	--	II	1993
PX-36	--	III	na
XG-235	G-363	uc	na
XG-250	S-736	uc	na
XG-261	--	uc	na
XG-264	G-412	uc	na
XG-269	G-392	uc	na
XG-271	G-382	uc	na
XG-273	--	uc	na
XG-276	G-353	uc	na
XG-279	G-403	uc	na
XG-284	G-366	uc	na
XG-285	G-355	uc	na
XG-286	G-460	uc	na
XG-287	G-354	uc	na
XG-291	G-421	uc	na
XG-293	G-395	uc	na
XG-294	G-1352	uc	na
XG-300	G-372	uc	na
XG-305	--	uc	na
XG-315	G-394	uc	na
XG-344	--	uc	na
XG-380	--	uc	na
XG-460	--	uc	na

Joint Service Designation	NATO Code	IP Class	UN No
ZX-9	--	III	na
ZX-13	S-720	uc	na
ZX-21	C-608	uc	na
ZX-24	S-718	uc	na
ZX-30	--	I	1263
ZX-34	S-1738	I	1993
ZX-35	S-740	uc	na
ZX-36	--	uc	na
ZX-38	S-722	uc	na
ZX-40	--	uc	na
ZX-41	S-1712	III	na
ZX-42	S-1714	uc	na
ZX-43	S-1716	uc	na
ZX-44	S-1718	uc	na
ZX-45	S-1720	uc	na
ZX-46	--	uc	na
ZX-47	--	uc	na
ZX-48	S-1724	uc	na
ZX-49	--	uc	na
ZX-50	S-1726	uc	na
ZX-51	--	uc	na
ZX-52	S-1728	uc	na
ZX-53	S-1732	uc	na
ZX-54	--	II	1268
ZX-55	S-749	I	1993

Joint Service Designation	NATO Code	IP Class	UN No
AVGAS-100LL	--	I	1203
AVTAG-FSII	F-40	I	1203
AVCAT-FSII	F-44	III	
AVPIN	S-746	I	1222
AVTUR	F-35	II	
AVTUR-FSII	F-34	II	
MTGAS	F-57	I	1203
ULGAS	F-67	I	1203
DIESO MILITARY	F-54	III	1202
DIESO UK	--	III	1202
DIESO MT	--	III	1202
DIESO F-76	F-76	III	1202
3/50 FFO	--	III	1202
36/50 FFO	--	III	1202
125/50 FFO	--	III	1202
370/50 FFO	--	III	1202
KERO/A	--	II	1223
KERO/B	F-58	II	1223
STOVE NAPHTHA	--	I	1268
WHITE SPIRIT	S-752	II	1300
WTA	S-1739	uc	na

na - Not applicable. Considered non-dangerous for carriage.

**TABLE 5A**  
**Products Obsolete in the United Kingdom**

Note: Any queries as to the use of obsolete products should be referred to the appropriate Service Authority, see page 5.

Product	Replacement	Remarks
AL-1	-	No further Service use
AL-2	-	No further Service use
AL-3	-	No further Service use
AL-4	-	No further Service use
AL-6	AL-34	-
AL-7	-	No further Service use
AL-8	AL-11	-
AL-9	AL-14	-
AL-10		
AL-15	-	No further Service use
AL-16	AL-34	-
AL-17	-	No further Service use
AL-19	-	No further Service use
AL-23	-	No further Service use
AL-24	-	No further Service use
AL-27	AL-26, obsolescent	See page 180
AL-29	-	No further Service use
AL-30	AL-34	-
AL-31	AL-41	No further Service use
AL-32	-	No further Service use
AL-33	-	No further Service use
AL-35	-	-
AL-38	AL-48	No further Service use
LG-60	-	No further Service use
LG-190	XG-279	-
LG-280	XG-286	No further Service use
LG-320	Proprietary	RO PLC sole use product
LG-380	XG-380	Re-named
LG-420	XG-287	-
LG-450	-	No further Service use
OC-28	-	No further Service use
OC-33	-	No further Service use
OC-35	-	No further Service use
OC-58	-	No replacement
OC-65	-	No further Service use BR no longer allow wick fed axle boxes on Rolling Stock.
OC-68	-	No further Service use
OC-100	-	No replacement
OC-135	OM-160	-
OC-208	-	No further Service use

TABLE 5A

Product	Replacement	Remarks
OC-310	OC-300	–
OC-338	OC-300	–
OEP-14	–	No further Service use
OEP-69	OEP-80	No further Service use
OEP-90	OEP-69 now obsolete	–
OEP-110	OEP-38 or OEP-220	Depending on temperature
OEP-740	OEP-215	In specified applications
OF-3	OX-8	–
OF-4	OX-87	–
OF-5	–	–
OF-16	OX-14	See page 93
OF-20	OX-8	–
OF-21	OX-8	–
OF-22	OX-14	See page 93
OF-24	OX-8	–
OF-30	–	No replacement
OF-35	–	No further Service use
OF-39	Proprietary	RO PLC sole use product
OF-285	OC-600	–
OF-300	Proprietary	–
OF-301	–	Designation originally applied to an ingredient of OF-20 and PX-12, no longer used
OM-1	–	No further Service use
OM-3	–	No further Service use
OM-6	–	No further Service use
OM-10	–	No further Service use
OM-14	–	No further Service use
OM-17	–	Refer to design authority
OM-21	–	–
OM-31	–	No further Service use
OM-32	–	No further Service use
OM-34	Proprietary	RO PLC sole use product
OM-35	OM-33	–
OM-36	–	No further Service use
OM-39	–	No further Service use
OM-41	Proprietary	RO PLC sole use product
OM-42	OM-33	–
OM-43	–	No further Service use
OM-51	–	No further Service use
OM-52	OM-58	–
OM-60	–	Designation originally applied to the base oil of OMD-60, no longer used
OM-62	–	No further Service use



TABLE 5A

Product	Replacement	Remarks
OM-81	Proprietary	RO PLC sole use product
OM-88	OM-100	-
OM-90	OM-160	-
OM-101	-	No further Service use
OM-108	-	RO PLC sole use product
OM-110	Proprietary	Designation originally applied to the base oil of OMD-110, no longer used
OM-111	-	RO PLC sole use product
OM-125	Proprietary	No further Service use
OM-260	-	Base oil for OMD-260, both now obsolete
OM-490	Proprietary	
OM-650	-	No further Service use
OM-800	OM-750	-
OMD-29	OMD-30	-
OMD-30	OMD-55	No further Service use
OMD-40	OMD-80	-
OMD-45	OMD-23	-
OMD-43	-	No present Service use
OMD-60	-	-
OMD-75	OMD-80	Upgrading of oil
OMD-80	OMD-80X	Upgrading of oil
OMD-80X	OMD-90	Upgrading of oil
OMD-85	-	No further Service use
OMD-109	-	-
OMD-110	OMD-80 or OMD-113	Subject to application
OMD-111	OMD-113	-
OMD-112	OMD-113	-
OMD-115	-	No present Service use
OMD-120	OMD-80 or OMD-113	Subject to application
OMD-170	OMD-270	-
OMD-175	-	No present Service use
OMD-260	-	No further Service use
OMD-270	-	No further Service use
OMD-280	-	No replacement
OX-10	OX-14	No further Service use
OX-12	-	No further Service use
OX-13	OX-18	-
OX-15	PX-26	-
OX-18	OX-24 For gun applications	For other applications see DCI
OX-21	-	No further Service use
OX-23	OX-27	-
OX-35	Proprietary	RO PLC sole use product
OX-52	OX-18 or PX-4	According to use

TABLE 5A

Product	Replacement	Remarks
OX-160	OM-13	In new and modified mechanisms
OX-250	OM-320	-
OX-270	Proprietary	-
OX-275	PX-27	-
OX-320	-	No further Service use
OX-335	PX-27	-
OX-520	-	No further Service use
PX-2	PX-31	-
PX-3	PX-32 or PX-28	-
PX-5	PX-15, obsolescent	See page 166
PX-8	PX-11	-
PX-9	PX-28	-
PX-10	PX-24	See page 168
PX-12	XG-250	In specified applications
PX-14	PX-4	-
PX-16	-	No further Service use
PX-23	-	No further Service use
PX-25	-	No further Service use
PX-29	PX-24	See page 168
PX-30	-	No further Service use
SG-230	-	No further Service use
SG-240	XG-271	See page 125
SG-250	-	No further Service use
SG-260	-	No further Service use
SG-330	-	No further Service use
XG-190	-	No further Service use
XG-220	-	No further Service use
XG-265	XG-293	-
XG-266	XG-276	-
XG-270	XG-293	-
XG-272	XG-284	-
XG-274	XG-291	No further Service use
XG-275	XG-287	-
XG-277	XG-293	-
XG-278	XG-287	-
XG-280	XG-264	-
XG-281	-	Not taken up
XG-283	-	No further Service use
XG-290	XG-287 or XG-293	For new equipment XG-287 Limited application in obsolete equipment use
XG-292	XG-293	XG-293
XG-295	XG-287	-
XG-310	XG-286	-

TABLE 5A

Product	Replacement	Remarks
XG-320	-	-
XG-329	XG-293	No further Service use
XG-330	XG-285	-
XG-333	XG-279	See page 128
XG-340	XG-264	-
XG-345	XG-287	-
XG-350	XG-271	-
XG-410	XG-235	See page 120
XG-430	-	-
XG-450	-	No further Service use
XG-480	-	No further Service use
XG-485	Proprietary	-
XG-490	-	No further Service use
ZX-1	ZX-9	No further Service use
ZX-2		
ZX-3	ZX-9	
ZX-4	-	-
ZX-5	-	No further Service use
ZX-6	-	No further Service use
ZX-7	Proprietary	No further Service use
ZX-8	Proprietary	-
ZX-10	-	-
ZX-11	XG-286	No further Service use
ZX-12	-	-
ZX-14	XG-235	No further Service use
ZX-15	-	-
ZX-16	Proprietary	-
ZX-17	-	No further Service use
ZX-20	-	No further Service use
ZX-21	-	No further Service use
ZX-22	ZX-32, obsolete	No replacement
ZX-25	ZX-30	No replacement
ZX-26	-	-
ZX-27	Proprietary	No further Service use
ZX-28/G	ZX-38	-
ZX-28/P	-	No further Service use
ZX-29	PX-24	-
ZX-31	-	No further Service use
ZX-32	-	No further Service use
ZX-33	-	No further Service use
ZX-53	-	No further Service use
45/30 DIESO	-	No further Service use
50/50 FFO	-	No further Service use
73 NL AVGAS	-	No further Service use
74 MTGAS	F-57	-
75/50 FFO	-	No further Service use

**TABLE 5A**

Product	Replacement	Remarks
80 MTGAS	COMBATGAS	–
80 NL AVGAS	–	No further Service use
80/Z MTGAS	–	No present Service use
CIVGAS F–50	–	–
3500 SECOND FFO	370/50 FFO	–
AVCAT	AVCAT/FSII	–
AVCAT/40	–	–
AVCAT/48	–	–
AVGAS 100	–	No present Service use
AVGAS 80	–	No further Service use
AVGAS 115	–	No further Service use
AVTUR/40	AVTUR	–
AVTUR/50	AVTUR	–
Cold Starting Fuel, Diesel Engine	–	No further Service use
DIESO SUBZERO	–	No present Service use
HTP	–	No further Service use
NL GAS	–	No further Service use
VAPO	–	No further Service use
Z COMBATGAS	–	No further Service use
COMBATGAS	–	No further Service use
CIVGAS	MTGAS	–

**TABLE 5B****Obsolete Reference Fuels**

Product	Replacement / Remarks
Aircraft Turbine Engine, AVTAG Type	No further Service use
74 Octane, Low Vapour Pressure, MT	See page 221
Reference Diesel Fuel, Low Temperature	See page 221
Reference Diesel Fuel, 47 Cetane	No further Service use
Reference Gasoline, High Lead	No further Service use
Reference Gasoline, Low Lead	See page 221
74 Octane, High Vapour Pressure, MT	See page 221
80 Octane, MT	See page 221
Reference Diesel Fuel, Low Temperature	AVTUR Def Stan 91-89
Diesel Fuel, 47 Cetane	No further Service use
Reference Diesel Fuel, 1% Sulfur	No further Service use

**TABLE 5C****Amended Designations**

Old Designation	New Designation	Remarks
LG-380	XG-380	-
100/130 AVGAS	AVGAS 100	No present Service use
115/145 AVGAS	AVGAS 115	No further Service use
47/20 DIESO	DIESO (UK)	-
47/20 DIESO, MT	DIESO (UK (MT))	-
47/20 DIESO, RN	DIESO F-76	-
47/20 DIESO NAVAL	DIESO F-76	-
47/0 DIESO	DIESO F-75	Not normally available in UK
47/0 DIESO, NAVAL	DIESO F-75	Not normally available in UK
47/0 DIESO, CEPS	DIESO MILITARY	-
47/0 DIESO, REGULAR	DIESO MILITARY	-
40/-40 DIESO	DIESO SUBZERO	No present Service use
40/-55 DIESO	DIESO SUBZERO	No present Service use
DIESO (UK)	DIESO UK	-
DIESO (UK (MT))	DIESO MT	-

**TABLE 6**

**Specifications Obsolete in the United Kingdom  
Since 1964**

All issues of the specification are cancelled, unless otherwise stated.

Cancelled Specification	Product	Remarks
<b>BR</b>		
665	OC-65, obsolete	No further Service use
1336	Fuels, Lubricants and Associated Products	Now Def Stan 01-5
<b>CS</b>		
1033	PX-2, obsolete	Now TS 10164 for PX-31
1250	OC-35, obsolete	Now Def Stan 91-10 cancelled
1419	OX-320	Now Def Stan 91-30
1485	AL-23, obsolete	No further Service use
1496	OM-17	Now Def Stan 91-36
1653	XG-280, obsolete	Now Def Stan 91-18 for XG-264
2060	PX-10	Now Def Stan 68-11
2298	PX-12, obsolete	Now Def Stan 59-10 for XG-250
2486B	PX-15	Now Def Stan 80-145
2592	XG-340, obsolete	Now Def Stan 91-18 for XG-264
2842	OX-13, obsolete	Now CS 3118 for OX-18
	OX-52, obsolete	Now CS 3118 for OX-18 and Def Stan 80-34 for PX-4
2868	ZX-27, obsolete	-
2902	OM-41, OM-81, OM-111	Now BS 4475/TLS 46, TLS 68, TLS 100
2906	OF-3, 24, obsolete	Now TS 10145 for OX-8
2908	AL-17, obsolete	No further Service use
2911	XG-220, obsolescent	Now Def Stan 91-8
2976	OF-39, obsolete	Now Def Stan 91-11 cancelled
2985	LG-190, obsolete	Now Def Stan 91-27 for XG-279
	LG-280, LG-320	Now Def Stan 91-17 for LG-280 and LG-320
2994	OMD-30	Now TS 10033
2997	ZX-1, ZX-2, obsolescent	Now Def Stan 91-23
3014	OM-34, obsolete	Now Def Stan 91-14 cancelled
3000	OEP-38, OEP-220	Now Def Stan 91-59/1
3033	OM-108, obsolete	Now Def Stan 91-15 cancelled
3106	OX-8	Now TS 10145
3107	XG-279	Now Def Stan 91-27
3108	OEP-14, obsolete	No further Service use
3121	ZX-34	Now Def Stan 91-19
3122	ZX-29, obsolete	Now Def Stan 91-72 for ZX-54

**TABLE 6**

Cancelled Specification	Product	Remarks
<b>DEF-</b>		
58	AL-8, obsolete	Now BS 1595: Part 1 for AL-11
2001	OM-13	Now Def Stan 91-44
2002	OM-21,obsolescent	Now BS 4475/Grade TLS 22
2003	OM-750,OM-1300	Now BS 4475/Grade CSB 680, CSB1000
2004	OM-58,OM-160	Now Def Stan 91-42
2006	OM-70	Now BS 2626/Grade 68
2007	OM-33	Now Def Stan 91-39
2008	OM-100	Now Def Stan 91-25
2101	OMD-40, 60, 110 and 330 (OMD-40, 60 & 110, obsolete)	Now Def Stan 91-43
2121	OC-160, obsolescent	Now Def Stan 91-21
2122	OC-600	Now Def Stan 91-20
2181	OX-275, obsolete	Now Def Stan 91-40 for PX-27
2182	OX-10	No further Service use
2221	LG-380	Now Def Stan 91-111
2261	XG-271, obsolescent	Now Def Stan 91-12
2301	ZX-5, obsolete	No further Service use
	ZX-6	Now Def Stan 91-26
2302	ZX-7, ZX-8, obsolete	Replaced by proprietary product
2303	ZX-1, ZX-2, obsolescent	Now Def Stan 91-23
2304	ZX-35	Now Def Stan 68-62
2331	PX-1	Now Def Stan 80-217
2332	PX-4	Now Def Stan 80-34
2333	PX-6, PX-7	Now Def Stan 91-38
2334	PX-11	Now Def Stan 80-85
2401	CIVGAS, COMBATGAS Z COMBATGAS	Now Def Stan 91-13 No present Service use
2402	DIESO MILITARY 47/20 DIESO, obsolete 40/-40 DIESO, obsolete	Now Def Stan 91-9 Now Def Stan 91-9 Now Def Stan 91-9
2403	KERO/A, obsolescent KERO/B	Now BS 2869/Class C1, Class C2
2404	VAPO, obsolete	Now Def Stan 91-3 cancelled
2405	Reference Fuels	Now Def Stan 91-7
2406	Furnace Fuel Oils	Now Def Stan 91-5
<b>Def Stan</b>		
59-10/2	XG-250	Now Def Stan 68-69/1
68-7/1	ZX-33	No further service use
68-11/1	PX-10	Now Def Stan 68-10/4 for PX-24

**Table 6**

Cancelled Specification	Product	Remarks
68-218/1	PX-29	Now Def Stan 68-10/4 for PX-24
91-3/1	VAPO, obsolete 3/50 FFO	No further Service use Now BS 2869/Class D
91-5/1 and 2	36/50 FFO, obsolescent 50/50 FFO, 75/50 FFO 125/50 FFO, 370/50 FFO	Now BS 2869/Class E No further service use Now BS 2869/Class F, Class G
91-7/2, 3 and 4	Reference Gasoline, High Lead Reference Gasoline, Low Lead Reference Diesel Fuel, High Sulfur	No further Service use  No further Service use  No further Service use
91-8/1	XG-220	No further Service use
91-9/1 and 2	47/0 DIESO, Regular  47/-55 DIESO, obsolete UK DIESO UK, MT, DIESO DIESO MILITARY DIESO SUBZERO, obsolete	Now Def Stan 91-9/3 for DIESO MILITARY No present Service use Now BS 2869/Class A2 Now BS 2869/Class A1 Now Def Stan 91-9/3 No present Service use
91-9/4	DIESO MILITARY	Now BS EN 590
91-10/1	OC-35, obsolete	No further Service use
91-11	OF-39	No further Service use
91-13	F-46 COMBATGAS F-50 CIVGAS	No further Service use No further Service use
91-14	OM-34	No further Service use
91-15	OM-108	No further Service use
91-17/1	LG-280, LG-320, obsolete	Now Def Stan 91-34 XG-286
91-23/1	ZX-1 & ZX-2	Now Def Stan 91-70 ZX-9
91-26/1	ZX-6	No further Service use
91-28/1	XG-274	Now D-Stan 91-105XG-291
91-30/1	OX-320	No further Service use
91-33/2	OM-24	Now BS 4475/CS ISO 22
91-36/1	OM-17	No further Service use
91-43/1	OMD-40, obsolete	Now Def Stan 91-113 OMD-90
91-50/1	PX-11	Now Def Stan 80-85/1
91-55/2	XG-300	Now MIL-G-25013
91-60/1	OM-70	Now BS2626 Type A Grade 68
91-76/1	CIVGAS	Now BS 4040
91-77/1	STOVE NAPHTHA	Now Proprietary
91-79/1	OX-18	Now Def Stan 91-102
91-81/2	OX-8	Now SAE J1704
91-107/1	OMD-8OX	Now Def Stan 91-113 OMD-90
96-1	ZX-20	No further Service use



**TABLE 6**

Cancelled Specification	Product	Remarks
<b>DERD</b>		
2450	OMD-160,OMD-250, OMD-370	Now SAE J 1899
2451	FSII	Now Def Stan 68-252
2452	AVCAT/FSII F-44	Now Def Stan 91-86
2453	AVTUR/FSII F-34	Now Def Stan 91-87
2454	AVTAG/FSII F-40	Now Def Stan 91-88
2458	OX-22	Now Def Stan 91-93
2461	S-1747	Now Def Stan 68-251
2468	OX-7	Now Def Stan 91-94
2472	OMD-270, OM-170,OM-270	Now SAE J 1966
2475	AVGAS 100LL	Now Def Stan 91-90
2479	OEP-71	Now Def Stan 91-97
2485	AVGAS 80 & 100LL	Now Def Stan 91-90
2486	AVTAG, obsolete	No further Service use
2487	OX-38	Now Def Stan 91-98
2490	OM-11	Now Def Stan 91-99
2491	AL-9, obsolete	Now BS 506 for AL-14
2492	AVPIN	Now Def Stan 91-89
2494	AVTUR and JET A-1	Now Def Stan 91-91
2497	OX-26	Now Def Stan 91-100
2498	AVCAT F-43	Now Def Stan 91-86
2499	OX-27 and OX-28	Now Def Stan 91-101
<b>DGS</b>		
145	OM-24	Now Def Stan 91-33
218	XG-310, obsolete	Now Def Stan 91-34 for XG-286
200/1047C	ZX-40	Now Proprietary
200/1048C	OX-72	Now Proprietary
200/1049	OM-490	Now Proprietary
200/1101B	OX-300	Now Proprietary
200/1102B	OX-29	Now Proprietary
200/1110A	OX-40	Now Def Stan 91-110
327	XG-286	Now Def Stan 91-34
338	OX-30	Now Def Stan 91-35
6920	OEP-69	Now Def Stan 91-32
6921	XG-274	Now Def Stan 91-28
6922	OM-65	Now BS 4475/Grade CSB 68
6923	OMD-112, obsolete	Now Def Stan 91-22
6924	OM-36, obsolete	No further Service use
<b>DTD</b>		
72	OF-300	No further Service use
279	PX-3, obsolete	Now Def Stan 80-83 for PX-32
388	OF-35, obsolete	No further Service use
392	ZX-13	Now Def Stan 80-80
548	OM-14, obsolete	Now Def Stan 91-48 for OM-15
561	OX-12, obsolete	No further Service use

**TABLE 6**

Cancelled Specification	Product	Remarks
577	XG-290, obsolete	Now Def Stan 91-53 for XG-287 for new equipment
581C	OEP-30 and OEP-70	Now Def Stan 91-112
585	OM-15	Now Def Stan 91-48
663	PX-9, obsolete	Now TS 10131 for PX-28 in certain applications
804	PX-14, obsolete	Now Def Stan 80-34 for PX-4
806	XG-285, obsolescent	Now Def Stan 91-54
822	OX-14	Now Def Stan 91-49
825	XG-275, obsolete	Now Def Stan 91-53 for XG-287
844	XG-278, obsolete	Now Def Stan 91-53 for XG-287
866	XG-295, obsolete	Now Def Stan 91-53 for XG-287
878	XG-277, obsolete	Now Def Stan 91-52 for XG-293
896	OX-23, obsolete	Now DERD 2499 for OX-27
897	XG-315	Now Def Stan 91-56
5527	XG-276	Now Def Stan 91-57
5530	ZX-28/G, obsolete	Now Def Stan 80-81 for
5578	ZX-28/P, obsolete	ZX-38
5579	OM-12	No further Service use
	XG-292, obsolete	Now Def Stan 91-47
5581	Damping Fluids:	Now Def Stan 91-52 for XG-293
	Dimethyl Silicone	Now Def Stan 91-46 and redesignated ZX-41 to ZX-52
5585	XG-300	Now Def Stan 91-55
5586	AL-26, obsolescent	Now Def Stan 68-61
5598	XG-287	Now Def Stan 91-53
5601	XG-293	Now Def Stan 91-52
5609	XG-284	Now Def Stan 91-51
5610	XG-269	Now MIL-G-4343
5617	ZX-38	Now Def Stan 80-81
<b>DTD 900</b>		
4031	AL-6, obsolete	Now DTD 900/4907 proprietary product for AL-34
4205	OM-12	Now Def Stan 91-47
4222	XG-265, obsolete	Now Def Stan 91-52 for XG-293
4276	OM-1	Now MIL-L-5020
4298	XG-250	Now Def Stan 59-10
4309	XG-344	Now DTD 900/4872

**Table 6**

Cancelled Specification	Product	Remarks
4310	AL-15, obsolete	No further Service use
4351	AL-16, obsolete	Now DTD 900/4907 proprietary product for AL-34
4361	OM-3, obsolete	No further Service use
4402	ZX-26, obsolete	No further Service use
4408	XG-273	Now DTD 900/4914
4420	XG-276	Now Def Stan 91-57
4422	ZX-14, obsolete	Now Def Stan 91-6 for XG-235
4439	XG-276	Now Def Stan 91-57
4513	OEP-740, obsolete	Now DTD 900/4981 for OEP-215
4609	XG-284	Now Def Stan 91-51
4651	XG-460	Now proprietary, no specification
4662	XG-261	Now proprietary, no specification
4667	XG-266, obsolete	Now Def Stan 91-57
4671	ZX-32, obsolete	No further Service use
4695	OM-22,obsolescent	Now BS 148, special grade with max pour point -45°C
<b>DTD 900</b>		
4725	OX-50, obsolete	Not available in UK
4804	AL-32, obsolete	No further Service use
4809	XG-329, obsolete	Now Def Stan 91-52 for XG-293
4906	AL-33, obsolete	No further Service use
4914	XG-273	Now Def Stan 91-85
4938	PX-16, obsolete	No further Service use
4941	OX-20	Now DTD 900/4881
4955	OX-20	Now DTD 900/4881
4963	AL-34	Now DTD 900/4907
4965	OX-20	Now DTD 900/4881
5540B	PX-26	Now Def Stan 80-142
<b>E-in-C</b>		
O-2	OM-65	Now BS4475/Grade CSB-68
O-3	OM-100	Now Def Stan 91-25
O-5	OM-112, obsolete	Now Def Stan 91-22
O-9	OM-36, obsolete	No further Service use
<b>MIL</b>		
G-4343	XG-269	Now SAE-AMS-G-4343
L-5020	OM-1	No further Service use
T-5542	ZX-32, obsolete	No further Service use
C-6529d	ZX-21, obsolete	No further Service use
L-46000C	XG-485, obsolete	No further Service use

**TABLE 6**

Cancelled Specification	Product	Remarks
<b>TS</b>		
321	ZX-29, obsolete	Now Def Stan 91-72 for ZX-54
325	PX-19, obsolescent	Now Def Stan 91-78
331	AL-26, obsolescent	Now Def Stan 68-61
333	Diesel Starter Fuel, obsolete	No further Service use
337	ZX-11, obsolete	Now Def Stan 91-34 for XG-286
10003	47/0 DIESO/CEPS, obsolete	Now Def Stan 91-9 for DIESO MILITARY
10033	OMD-30	Now Def Stan 91-68
10033E	OMD-80	Now Def Stan 91-107
10035	PX-25, obsolete	No further Service use
10042	OMD-115, obsolete	No present Service use
10067	AL-38	Now Def Stan 68-128
10111A	OMD-45 and OMD-175	New Def Stan 91-104
10131	PX-28	Now Def Stan 80-143
10134	OX-165	Now Def Stan 91-71
10145	OX-8	Now Def Stan 91-81
10151	PX-29	Now Def Stan 68-218
10164	PX-31	Now Def Stan 80-186
10165	OM-18	Now Def Stan 91-48
10177	AL-39	Now Def Stan 68-127
10180	PX-30	No further Service use
10184A	Stove Naphtha	Now Def Stan 91-77
10188	AL-40	Now Def Stan 68-129

**TABLE 7**

**Obsolete NATO Codes**

Note: The UK Joint Service Designation of several products listed in this table were amended during their existence. These are shown in chronological order in the Joint Service Designation of UK Replacement columns.

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
C-612	—	Heavy oil type preservative compound.	—
C-617	—	Aircraft engine, metallic, preservative compound	—
C-618	PX-3, obsolete	Corrosion preventive compound, hard film, cold application. Superseded by PX-32 or PX-28. No NATO Code.	PX-32 or PX-28
C-619	—	Aircraft engine, metallic, preservative compound. Superseded by C-610, Corrosion preventive oil, aircraft engine, turbine	—
C-622	ZX-21, obsolete	Aircraft engine, non metallic, preservative compound, Type I. Superseded by C-608.	ZX-21, obsolete
C-623	—	Aircraft engine, non metallic, preservative compound, Type II. Superseded by C-609.	Proprietary
C-624	ZX-17, obsolete	Aircraft engine, non metallic, preservative compound, Type III. Superseded by C-610, No further UK Service use.	No replacement
C-626	—	Hard film preservative compound. Superseded by C-632, Corrosion preventive compound, hard film, cold application.	—
C-627	—	Corrosion Preventive Compound: Soft Film Hot Application	—

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
C-628	PX-11	Corrosion Preventive Soft Film, Hot Application	—
C-636	ZX-15, obsolete	Thrust augmentation fluid, soluble oil	No replacement
C-637	—	Hydraulic equipment, preservative compound	—
C-639	—	Corrosion preservative oil, gas turbine. Synthetic base.	—
C-654	-	Corrosion preventive, soft film, hot application	NATO Code deleted
F-12	—	Leaded aviation gasoline, grade 80/87.	—
F-13	73 NL AVGAS	Non leaded aviation gasoline, grade 73.	—
F-14	80 NL AVGAS	Non leaded aviation gasoline, grade 80.	—
F-15	91/96 AVGAS	Aviation gasoline, grade 91/96.	—
F-18	100LL AVGAS	Aviation gasoline, grade 100/130.	—
F-20	AVTAG FSII	Turbine fuel, aviation, wide cut type, plus FSII	AVTAG/FSII F-40
F-22	115/145 AVGAS	Aviation gasoline, grade 115/145.	—
F-30	(1) AVTUR (2) AVTUR/40	Turbine engine fuel. Superseded by F-34  AVTUR subsequently allocated F-35	(1) AVTUR/50 (2) AVTUR (3) AVTUR/FSII
F-32	—	Turbine engine fuel, kerosene type.	—
F-33	—	Turbine engine fuel, kerosene type.	—

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
F-42	(1) AVCAT/40 (2) AVCAT/48 (3) AVCAT (4) AVCAT/FSII	Turbine engine fuel, high flash, kerosene type. Originally F-44, see below.  Superseded by F-44. AVCAT subsequently allocated F-43.	AVCAT/FSII
F-43	AVCAT	Turbine engine fuel, superseded by F-44	AVCAT/FSII
F-45	AVTAG	Turbine engine fuel, wide cut gasoline type. Superseded by F-40.	AVTAG Now obsolete
F-46	—	Gasoline, Automotive: Military, 91 RON	—
F-47	—	Gasoline, 80 octane	—
F-48	(1) 80/Z MT GAS (2) Z COMBATGAS	Gasoline, 80 octane, artic. Superseded by F-53, now also obsolete.	— Z COMBATGAS No present UK Service use
F-50	CIVGAS		No further Service use
F-52	—	Diesel fuel, 47 cetane. Superseded by F-54	DIESO MILITARY
F-53	Z COMBATGAS, obsolete	Gasoline, automotive, combat, subzero	No further UK Service use.
F-55	—	Diesel fuel, 40 cetane	—
F-56	(1) DIESO 45/-30 (2) DIESO 45/-40 (3) DIESO 45/-55 (4) DIESO SUBZERO	Diesel fuel, subzero	DIESO SUBZERO DIESO SUBZERO No further Service use.
F-59	—	Kerosene. Superseded by F-58.	KERO/B
F-62	—	Fog oil	—
F-64	—	Fog oil, high viscosity type.	—
F-77	50/50 FFO	Fuel, residual light viscosity boiler.	No further Service use.

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
F-78	47/0 DIESO	Diesel fuel, naval, zero pour. Superseded by F-75.	(1) 47/0 DIESO NAVAL (2) DIESO F-75 Not normally available in UK
F-79	(1) 47/20 DIESO, RN (2) 47/20 DIESO, NAVAL	Diesel fuel, naval 20 pour. Superseded by F-76.	(1) 47/20 DIESO NAVAL (2) DIESO F-76
F-82	75/50 FFO		75/50 FFO
F-84	75/50 FFO	Fuel oil, naval, boiler, 75/50	No further Service use.
F-85	—	Diesel fuel, naval, zero pour, Superseded by F-75	DIESO F-75 Not normally available in UK
G-350	XG-275, obsolete	Grease, aircraft, synthetic, general purpose. Superseded by G-354	(1) XG -278 obsolete (2) XG-287
G-352	XG-295	Grease, aircraft, synthetic, extreme low temperature. Superseded by G-354	(1) XG-278 obsolete (2) XG-287
G-357	XG-273	Grease, aircraft, synthetic, graphite. Product still used by UK.	XG-273
G-364	XG-410, obsolete	Hydrocarbon resistant grease. Superseded by G-363.	XG-235
G-400	LG-190, obsolete	Grease, automotive, water pump.	XG-279
G-402	—	Wheel bearing grease, temperate climate. Superseded by G-403	XG-279
G-404	LG-280	Grease, temperate climate, general purpose. Product still used by UK, Marine applications only	XG-286



**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
G-405	LG-320, obsolete	Grease, temperate climate, wheel bearings. Product still used by UK.	Proprietary
G-406	LG-380	Grease, general purpose, low temperature. Product still used by UK.	XG-380
G-407	—	Grease, graphite, soft	—
G-413	—	Grease, automotive and weapons, soft.	—
G-414	—	Grease, automotive and weapons, hard.	—
G-450	XG-274, obsolete	Grease, naval, general purpose Ball and Roller bearing superseded by G-421	XG-291
H-532	OF-35, obsolete	Hydraulic fluid, type OF-35.	No further Service use
H-533	—	Hydraulic fluid, castor oil base.	—
H-534	OF-4, obsolescent	Hydraulic fluid, castor oil base. Product still used by UK.	OF-4, obsolete
H-535	—	Hydraulic fluid, petroleum, missile	—
H-543	—	Brake fluid.	—
H-545	—	Heavy shock absorber fluid.	—
H-546	—	Heavy shock absorber fluid.	—
H-570	—	Hydraulic fluid, petroleum, inhibited, high, VI. Superseded by H-573, Hydraulic fluid, petroleum, inhibited	—
H-582	—	Hydraulic fluid, synthetic, fire resistant.	—
O-112	—	Synthetic oil, special purpose.	—

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
O-113	-	Lubricating oil, aircraft piston engine, grade SAE 30	NATO Code deleted
O-115	OM-170, obsolescent	Lubricating oil, aircraft piston engine, grade 1080. Product still used by UK	OM-170, obsolescent
O-117	OM-270	Lubricating oil, aircraft piston engine, grade SAE 50	NATO Code deleted
O-123	OMD-160	Lubricating oil, aircraft piston engine, dispersant base mineral oil, grade SAE 40	NATO Code deleted
O-125	OMD-250	Lubricating oil, aircraft piston engine, dispersant base mineral oil, grade SAE 50	NATO Code deleted
O-127	OMD-270	Lubricating oil, aircraft piston engine, grade D-1110, detergent. Product still used by UK	OMD-270, obsolescent
O-128	OMD-370	Lubricating oil, aircraft piston engine, dispersant base mineral oil, grade SAE 60	NATO Code deleted
O-132	-	Lubricating oil, aircraft turbine engine, grade 1005.	-
O-140	OM-150, obsolescent	Lubricating oil, aircraft controls, antifreezing. Product still used by UK	OM-150, obsolescent
O-158	XG-485	Grease Aircraft semi-fluid	XG-485 obsolescent
O-162	OMD-162	Lubricating oil, aircraft piston engine dispersant, grade SAE 15W-50	NATO Code deleted
O-177	OMD-40, obsolete	Heavy duty engine oil, grade 10. Superseded by O-176.	OMD-80
O-180	OMD-75, obsolete	Lubricating oil, engine, moderate duty diesel engine service, multigrade.	OMD-80

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
O-182	OMD-330	Lubricating oil, engine, grade SAE 50	NATO Code deleted
O-183	OMD-30	Lubricating oil engine, moderate duty.	No further Service use
O-184	OEP-220	Lubricating oil, gear, extreme pressure, grade 90. Superseded by O-226.	OEP-220
O-188	OEP-14, obsolete	Lubricating oil, gear, extreme pressure, subzero	No further Service use
O-190	OX-18	Lubricating oil, corrosion preventive.	OX-24
O-194	-	Armament cleaning oil	NATO Code deleted
O-196	-	Lubricating oil, general purpose, light	NATO Code deleted
O-197	-	Lubricating oil, exposed gear, light.	-
O-202	-	Lubricating oil, exposed gear, light.	-
O-205	-	Lubricating oil, railway bearing.	-
O-206	-	Lubricating oil, railway traction.	-
O-214	ZX-1	Cutting fluid – soluble	ZX-9
O-216	-	Cutting fluid, compounded	NATO Code deleted
O-218	OX-320	Lubricating oil, colloidal graphite	No further Service use
O-219	OEP-220	Extreme pressure gear oil, grade 90. Superseded by O-184, now also obsolete. Superseded by O-226.	OEP-220
O-220	OEP-38	Extreme pressure gear oil, grade 75. Superseded by O-186.	OEP-38
O-222	OEP-14, obsolete	Extreme pressure gear oil, subzero. Superseded by O-188, now also obsolete.	No further Service use

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
O-224	—	Lubricating oil, type diesel service, grade 10. Superseded by O-237. Lubricating oil, engine, severe duty diesel engine service, grade 10W.	—
O-225	—	Lubricating oil, type diesel service, grade 10. Superseded by O-238. Lubricating oil, engine, severe duty, diesel engine service, grade 30.	—
O-227	—	Lubricating oil, gear, multipurpose, grade 30. Superseded by O-226	OEP-220
O-229	—	Lubricating oil, jewel bearing instruments	—
O-230	—	Lubricating oil, internal combustion engine, heavy duty, grade 10. Superseded by O-237, Lubricating oil, engine service, grade 10W	—
O-232	—	Lubricating oil, internal combustion engine, heavy duty, grade 30. Superseded by O-238, Lubricating oil, engine, severe duty, diesel engine service, grade 30.	—
O-234	—	Lubricating oil, internal combustion engine, grade 50. Superseded by O-239, Lubricating oil, engine, severe duty, diesel engine service, grade 50.	—
O-235	—	Lubricating oil, multigrade, artic grade.	—
O-236	OMD-85, obsolete	Lubricating oil, engine, severe duty, diesel engine service, multigrade 15W/40.	No further Service use

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
O-242	—	Lubricating oil, engine, naval diesel, grade 10. Superseded by O-272, Lubricating oil, naval, diesel, moderate service, grade 10.	—
O-243	—	Lubricating oil, engine, naval diesel, grade 20. Superseded by O-273, Lubricating oil, naval diesel, moderate service, grade 30.	—
O-244	—	Lubricating oil, engine, naval diesel, grade 30. Superseded by O-274, Lubricating oil, naval diesel, moderate service, grade 30.	—
O-245	—	Lubricating oil, engine, naval diesel, grade 40. Superseded by O-275, Lubricating oil, naval diesel, moderate service, grade 40, now also obsolete.	—
O-247	OMD-109, obsolete	Lubricating oil, engine, naval diesel, grade 30. Superseded by O-180. O-180 subsequently reallocated to OMD-75.	OMD-110, obsolete
O-248	OMD-112, obsolete	Lubricating oil, engine, naval diesel grade 30. Superseded by O-276.	OMD-113
O-249	OEP-69, obsolete	Lubricating oil, steam turbine and gear, extreme pressure	OEP-80
O-256	OM-750	Steam engine lubricating oil, SSC. Superseded by O-252.	OM-750
O-260	OM-1300	Steam engine lubricating oil, SSC. Superseded by O-258.	OM-1300

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
O-263	—	Lubricating oil, compounded, naval. Superseded by O-254.	OC-160, obsolescent
O-273	—	Lubricating oil, Naval Diesel: Moderate service.	—
O-275	—	Lubricating oil, engine, naval diesel, grade 40, severe conditions.	—
O-276	—	Lubricating oil, Naval Diesel: Moderate service.	—
O-277	OMD-113	Lubricating oil, engine, naval diesel. Superseded by O-278.	OMD-113
O-280	OM-36, obsolete	Lubricating oil, refrigerant compressor, uninhibited.	No further Service use
O-282	—	Lubricating oil, refrigerant compressor, uninhibited.	—
O-284	—	Lubricating oil, refrigerant compressor, uninhibited.	—
O-286	—	No information	—
O-287	—	No information	—
O-288	OM-36, obsolete	Lubricating oil, refrigerant compressor, uninhibited. Superseded by O-280, now also obsolete.	No further Service use
O-289	OM-70	Lubricating oil refrigerant compressor, uninhibited. Superseded by O-285.	OM-70
S-712	OM-1	Compass fluid, aircraft petroleum.	No further Service use
S-714	—	Compass fluid, aircraft, alcohol.	—
S-719	ZX-12, obsolete	Antiseize compound, oxygen systems. Superseded by S-717.	No further Service use

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
S-723	—	No information	—
S-724	—	No information	—
S-725	—	Antiseize compound, white lead. Superseded by S-716. Antiseize compound, lead free.	—
S-726	—	Pigmented varnish jointing compound, DTD 369A. No longer classified as a fuels and lubricants item, but still used by UK.	—
S-727	—	Antiseize and jointing compound. Superseded by S-725, Antiseize compound, white lead, now also obsolete. Superseded by S-716, Antiseize compound, lead free.	—
S-728	—	No information	—
S-729	—	No information.	—
S-730	—	No information	—
S-734	—	No information.	—
S-735	AL-3	Antifreeze Aircraft Engine	—
S-739	AL-34	Deicing and defrosting fluid. Superseded by AL-30. No NATO Code which in turn was superseded by S-1746.	AL-34
S-744	AL-16, obsolete	Deicing and defrosting fluid. Superseded by AL-30. No NATO Code which in turn was superseded by S-1746.	AL-34
S-748	AL-31	Fuel System icing inhibitor superseded by S-1745.	AL-41
S-754	—	Potentiometer oil.	—
S-755	—	No information.	—

**TABLE 7**

NATO Code	Joint Service Designation	Remarks	Joint Service Designation of UK Replacement
S-762	-	Windscreen washing liquid	NATO Code deleted
S-1722	-	Damping fluid, dimethyl silicone, 350 cSt.	-
S-1730	-	Damping fluid, dimethyl silicone, 101.000 cSt. Superseded by S-1728.	ZX-52
S-1734	-	Damping fluid, dimethyl silicone, 214.000 cSt. Superseded by S-1732.	ZX-53, obsolete No further Service use
S-1740	AL-24, obsolescent	Methanol/water, 60/40. Product still used by UK.	AL-24, obsolescent
S-1741	-	Methanol/water, 60/40 +1% C-630.	-
S-1742	-	Methanol/water, 50/50	-
S-1743	-	Methanol/water, 50/50 +1% C-630.	-



## GENERAL INDEX

	Page
ANTIFREEZE: Automotive	270
ANTIFREEZE: Automotive engine	268
ANTIFREEZE, INHIBITED ETHANEDIOL	182, 270
ANTISEIZE COMPOUND: Aircraft, oxygen system	145, 264
ANTISEIZE COMPOUND: Graphite	143, 264
ANTISEIZE COMPOUND: Lead free	263
ANTISEIZE COMPOUND: Molybdenum disulfide	150, 264
ANTISEIZE TAPE: Aircraft oxygen system	275
BRAKE FLUID, AUTOMOTIVE	87, 254
BRAKE FLUID, SYNTHETIC: Silicone	254
COMPASS FLUID: Aircraft, petroleum	263
COMPOUND: Rust penetrating oil	154
COOLANT FLUID, INHIBITED: Radio equipment	178
CORROSION INHIBITOR	186, 277
CORROSION PREVENTIVE: Hard film, hot application	164
CORROSION PREVENTIVE: Weapon cleaner, lubricant	172
CORROSION PREVENTIVE COMPOUND: Aircraft structures	171
CORROSION PREVENTIVE COMPOUND: Hard film, cold application	170
CORROSION PREVENTIVE COMPOUND: Hard film, hot application	164
CORROSION PREVENTIVE COMPOUND: Hydraulic system	167, 261
CORROSION PREVENTIVE COMPOUND: Soft film, cold application	158, 259
CORROSION PREVENTIVE COMPOUND: Soft film, grease type	165
CORROSION PREVENTIVE COMPOUND: Soft film, 162 hot application	
CORROSION PREVENTIVE COMPOUND: Undersealing	169
CORROSION PREVENTIVE COMPOUND: Water displacing	166, 261
CORROSION PREVENTIVE OIL: Thin film	159
CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Concentrate	144, 257
CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Piston	258
CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Piston, metallic	168, 259
CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Turbine	258
CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Turbine, synthetic	262
CORROSION PREVENTIVE OIL, AIRCRAFT PISTON ENGINE: Static preservation, upper cylinder	163, 258
CORROSION PREVENTIVE SOLUBLE OIL: Thrust augmentation fluid	260

## GENERAL INDEX

	Page
CUTTING FLUID: Soluble	235
CUTTING FLUID: Soluble, Biostable	144
DAMPING FLUIDS: Dimethyl silicone	152, 271 - 274
DAMPING FLUID: Silicone base	90
DEICING, DEFROSTING FLUID: Aircraft surfaces, ground use	180, 266, 277
DEICING, DEFROSTING FLUID: Aircraft surfaces, in flight	170, 267
DIESEL FUEL, GENERAL PURPOSE	203
DIESEL FUEL, GENERAL PURPOSE MT	204
DIESEL FUEL, MILITARY	202, 224
ETHANOL, DENATURED	266
ETHANEDIOL, TECHNICAL	177
FLUSHING OIL	60
FUEL, BURNER DISTILLATE: Class D	208
FUEL, NAVAL DISTILLATE	205, 226
FUEL, NAVAL DISTILLATE: Low pour point	226
FUEL, RESIDUAL: Boiler, Class E	209
FUEL, RESIDUAL: Boiler, Class F	210
FUEL, RESIDUAL: Boiler, Class G	211
FUEL, RESIDUAL: Light viscosity, boiler	226
FUEL SYSTEM ICING INHIBITOR: High flash type	184, 276
GASOLINE, AUTOMOTIVE LEADED: 96 RON	198, 224
GASOLINE, AUTOMOTIVE: Unleaded	199, 225
GASOLINE, AVIATION: Grade 100/130	190
GRAPHITE POWDER, LUBRICATING	265
GREASE: General use	250
GREASE: Multi-purpose, heavy duty	131
GREASE: Multi-purpose, low temperature range	130, 244
GREASE: Silicone, metal to rubber	136, 247
GREASE, AIRCRAFT: General purpose	123, 246
GREASE, AIRCRAFT: Graphite	128, 244
GREASE, AIRCRAFT: Helicopter oscillating bearing	127, 245
GREASE, AIRCRAFT: High temperature	137
GREASE, AIRCRAFT: Multipurpose	132, 247
GREASE, AIRCRAFT: PTFE	247
GREASE, AIRCRAFT: Semifluid	232
GREASE, AIRCRAFT: Silicone, pneumatic system	136, 247
GREASE, AIRCRAFT: Synthetic, extreme pressure	244
GREASE, AIRCRAFT: Synthetic, graphite	124
GREASE, AIRCRAFT: Synthetic, high temperature	134, 246
GREASE, AIRCRAFT: Synthetic, molybdenum disulphide	125, 243
GREASE, AIRCRAFT: Synthetic, pneumatic system	122, 246
GREASE, AIRCRAFT: Synthetic, wide temperature	245
GREASE, AUTOMOTIVE AND ARTILLERY	126, 249
GREASE, CALCIUM BASE	138

## GENERAL INDEX

	Page
GREASE, GRAPHITE: Medium	121, 249
GREASE, MOLYBDENUM DISULFIDE	135
GREASE, NAVAL: Graphite	139
GREASE, PERFLUORINATED, LOX COMPATIBLE	248, 251
GREASE, PLUG VALVE, HYDROCARBON RESISTANT	118, 245
GREASE, SEA WATER RESISTING	129, 251
GREASE, SILICONE	120
GREASE, STERN TUBE: Emulsifying	151
HYDRAULIC FLUID: Aircraft	110
HYDRAULIC FLUID, AQUEOUS POLYGLYCOL BASED: Fire Resistant	102
HYDRAULIC FLUID, AUTOMATIC TRANSMISSION	106, 255
HYDRAULIC FLUID, CHLORINATED SILICONE	103, 252
HYDRAULIC FLUID, LOW TEMPERATURE SYNTHETIC	115, 253
HYDRAULIC FLUID, PETROLEUM	253
HYDRAULIC FLUID, PETROLEUM: Antiwear	61, 256
HYDRAULIC FLUID, PETROLEUM: Emulsifying	100
HYDRAULIC FLUID, PETROLEUM: Inhibited	255
HYDRAULIC FLUID, PETROLEUM: Normal	58, 252
HYDRAULIC FLUID, PETROLEUM: Ordnance	256
HYDRAULIC FLUID, PETROLEUM: Superclean	55, 252
HYDRAULIC FLUID, PETROLEUM: Uninhibited	63, 255
HYDRAULIC FLUID, PHOSPHATE ESTER BASE	93
HYDRAULIC FLUID, PHOSPHATE ESTER: Fire resistant	257
HYDRAULIC FLUID, SYNTHETIC, FIRE RESISTANT	92, 253
HYDRAULIC FLUID, SYNTHETIC: Less flammable	254
HYDRAULIC FLUID, WATER GLYCOL: Fire resistant	257
INSULATING OIL: Electrical	56, 269
INSULATING OIL, ELECTRICAL: Low pour point	59
ISOPROPANOL, TECHNICAL	175, 265
ISOPROPYL NITRATE	194, 267
KEROSENE	215, 224
KEROSENE: Flueless burner, Class C1	214
LOW TEMPERATURE FUEL BLEND (DIESEL)	225
LUBRICANT, CLEANER AND PRESERVATIVE FOR WEAPONS	270
LUBRICANT, ELECTRICAL SLEEVING	149
LUBRICANT, SOLID FILM: Air drying	268
LUBRICANT, SOLID FILM AIR DRYING CORROSION INHIBITING	155
LUBRICANT, SOLID FILM: Extreme environment	275
LUBRICANT, SOLID FILM: Heat cured	147, 275
LUBRICANT, SOLID FILM: Unbonded, graphite dispersion	146
LUBRICATING FLUID, GEAR: Synthetic	113
LUBRICATING OIL, AIRCRAFT CONTROLS: Antifreezing	67
LUBRICATING OIL, AIRCRAFT PISTON ENGINE	69
LUBRICATING OIL, AIRCRAFT PISTON ENGINE:	79
Dispersant base mineral oil, Grade SAE 40	
LUBRICATING OIL, AIRCRAFT PISTON ENGINE:	81
Dispersant base mineral oil, Grade SAE 50	

## GENERAL INDEX

	Page
LUBRICATING OIL, AIRCRAFT PISTON ENGINE:	83
Dispersant base mineral oil, Grade SAE 60	
LUBRICATING OIL, AIRCRAFT PISTON ENGINE: SAE 50	70
LUBRICATING OIL, AIRCRAFT TURBINE ENGINE:	52, 65, 227
Petroleum	
LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum,	43, 228
extreme pressure	
LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum,	227
Grade 1010	
LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic	86, 88, 229
3 cSt	
LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic	96, 97,
5 cSt	231, 233
LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic	101, 229, 232
7.5 cSt	
LUBRICATING OIL, COMPOUNDED: Naval	36, 239
LUBRICATING OIL, COMPRESSOR: Synthetic	111
LUBRICATING OIL, SMALL ARMS AND LIGHT CALIBRE WEAPONS	95, 232
LUBRICATING OIL, ENGINE: Diesel two-stroke, heavy duty, monograde,	
Grade SAE 40	78
LUBRICATING OIL, ENGINE: Grade 50	82
LUBRICATING OIL, ENGINE: Preservative, Grade 10	262
LUBRICATING OIL, ENGINE: Preservative, Grade 30	262
LUBRICATING OIL, ENGINE: Severe duty, diesel and gasoline	243
service, Grade 15W/40	
LUBRICATING OIL, ENGINE: Severe duty, diesel engine service,	236
Multigrade 15W/40	
LUBRICATING OIL, ENGINE: Severe duty, diesel engine service,	75, 242
SAE 5W/30	
LUBRICATING OIL, ENGINE: Severe duty, diesel engine service,	76, 242
SAE 10W/30	
LUBRICATING OIL, ENGINE: Severe duty, diesel service, Grade 10W	237
LUBRICATING OIL, ENGINE: Severe duty, diesel service, Grade 30	237
LUBRICATING OIL, ENGINE: Severe duty, diesel service, Grade 50	237
LUBRICATING OIL, ENGINE: Sub zero	233
LUBRICATING OIL, ENGINE: Two-Stroke	74
LUBRICATING OIL, ENGINE: Diesel Two-Stroke Heavy Duty, Grade SAE 40	78
LUBRICATING OIL, GASOLINE ENGINE: Two Stroke	242
LUBRICATING OIL, GEAR: Aircraft, light grade	40, 230
LUBRICATING OIL, GEAR: Aircraft, medium grade	42, 231
LUBRICATING OIL, GEAR, COMPOUNDED	37, 38, 235
LUBRICATING OIL, GEAR: Extreme pressure, Grade 75W	41, 234
LUBRICATING OIL, GEAR: Extreme pressure, Grade 80W/90	46, 236
LUBRICATING OIL, GEAR: Extreme pressure, Grade 85W/140	236
LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 75W/80	47
LUBRICATING OIL, GEAR: Extreme pressure, Limited slip	48
Grade SAE 80W-90	

## GENERAL INDEX

	Page
LUBRICATING OIL, GEAR: Extreme Pressure, Grade SAE 80W/140	49
LUBRICATING OIL, GEAR: Helicopter	45
LUBRICATING OIL, GENERAL PURPOSE: Light	54, 227
LUBRICATING OIL, GENERAL PURPOSE:	53, 228
Low temperature	
LUBRICATING OIL, GENERAL PURPOSE:	54, 227
Petroleum, light	
LUBRICATING OIL, GENERAL PURPOSE:	91, 234
Preservative, light	
LUBRICATING OIL, GENERAL PURPOSE:	234
Preservative, medium	
LUBRICATING OIL, INSTRUMENT: Synthetic	89, 229
LUBRICATING OIL, LOW TEMPERATURE, WEAPONS	232
LUBRICATING OIL, MARINE GAS TURBINE SYNTHETIC	94, 98
LUBRICATING OIL, NAVAL DIESEL: Moderate service	240
LUBRICATING OIL, NAVAL DIESEL: Severe service	77, 240
LUBRICATING OIL, NAVAL GEAR: Extreme pressure	240
LUBRICATING OIL, PETROLEUM: Compressor, light	62
LUBRICATING OIL, PETROLEUM: Compressor, medium	68
LUBRICATING OIL, REFRIGERANT COMPRESSOR:	241
Inhibited	
LUBRICATING OIL, REFRIGERANT COMPRESSOR:	64, 242
Uninhibited	
LUBRICATING OIL, SEMI LIQUID, FOR MACHINE GUNS	235
LUBRICATING OIL, STEAM CYLINDER: Saturated	71, 239
LUBRICATING OIL, STEAM CYLINDER: Superheated	72, 239
LUBRICATING OIL, STEAM TURBINE AND GEAR:	44, 238
Extreme pressure	
LUBRICATING OIL, STEAM TURBINE AND GEAR:	66, 238
Light service	
LUBRICATING OIL, STEAM TURBINE AND GEAR:	238
Moderate service	
LUBRICATING OIL, STERN TUBE: Emulsifying	105, 114
LUBRICATING OIL, SYNTHESIZED HYDROCARBON	99
LUBRICITY IMPROVING ADDITIVE FOR AVIATION TURBINE FUELS	186, 277
METHANOL, TECHNICAL	176, 268
METHANOL/WATER: 44/56	179, 276
METHANOL/WATER: Hydrogen Generators	183
MIXTURE OF FUEL SYSTEM ICING INHIBITOR, AL-41 AND CORROSION INHIBITOR/LUBRICITY IMPROVING ADDITIVE	185
MOLYBDENUM DISULFIDE LUBRICATING OIL:	104, 274
Silicone base	
MOLYBDENUM DISULFIDE POWDER, LUBRICATING	148, 266
NAPHTHA FOR COOKING STOVES	216
PETROLATUM, TECHNICAL	161, 267
PETROLATUM, TECHNICAL: Hard	160
REFERENCE FUELS	218
SILICONE COMPOUND: Electrical insulating	119, 265

## GENERAL INDEX

	Page
TRANSMISSION FLUID	109
TRANSMISSION FLUID TO-4 (SAE 10W)	107
TRANSMISSION FLUID TO-4 (SAE 30)	108
TURBINE FUEL, AVIATION: High flash type with FSII	193, 223
TURBINE FUEL, AVIATION: Kerosene type	195, 222
TURBINE FUEL, AVIATION: Kerosene type with FSII	196, 222
TURBINE FUEL, AVIATION: Wide cut type with FSII	192, 223
WATER, THRUST AUGMENTATION: Demineralized	187, 276
WATER DISPLACING FLUID	166, 261
WINDSCREEN WASHING FLUID: Aircraft	181
WHITE SPIRIT	188, 269

## Viscosity / Temperature Characteristics Charts

- Fig 1**    **Fuels**
- 2**    **OEP-Oils**
  - 3**    **OM-Oils**
  - 4**    **OMD-Oils**
  - 5**    **OX-Oils**

### **Note**

These charts indicate the approximate viscosity of Service lubricating oils and fuels over a range of temperatures.

In general, typical viscosity / temperature values have been plotted. Specification limits for viscosity on each product can be obtained by reference to the text of the Standard.

For the fuels chart, dotted lines indicate the variation in CFPP requirements for Summer and Winter.

For the lubricant charts, curves cover the normal use temperature range where possible and broken lines indicate the approach of the pour point.

It should be noted that these charts are approximations and the degree of approximation depends on how closely the viscosity limits are fixed by the specification and how far the temperature departs from that at which the specification limits are given.

FIG 1 VISCOSITY CHARACTERISTICS : FUELS

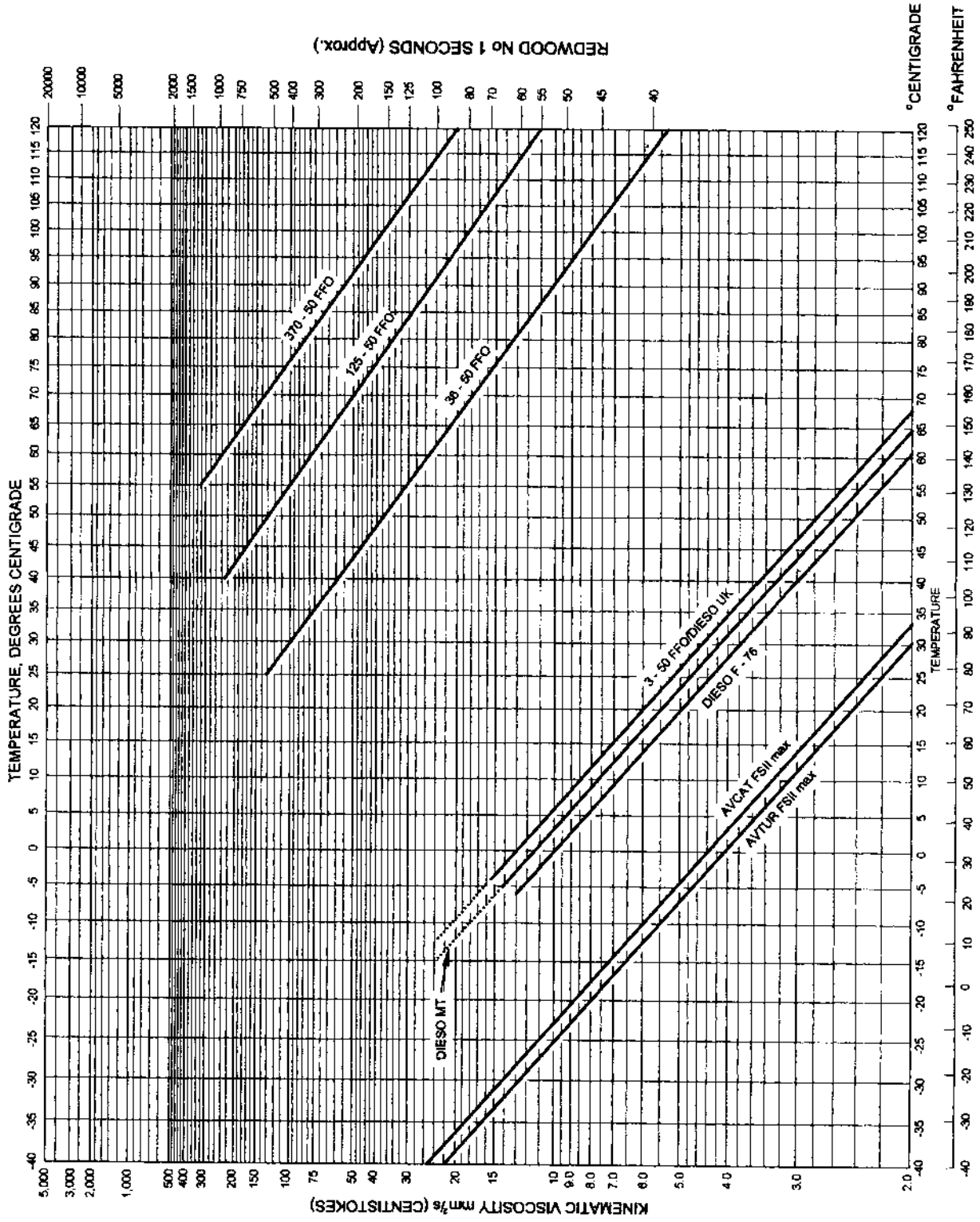




FIG 2 VISCOSITY CHARACTERISTICS : OEP OILS

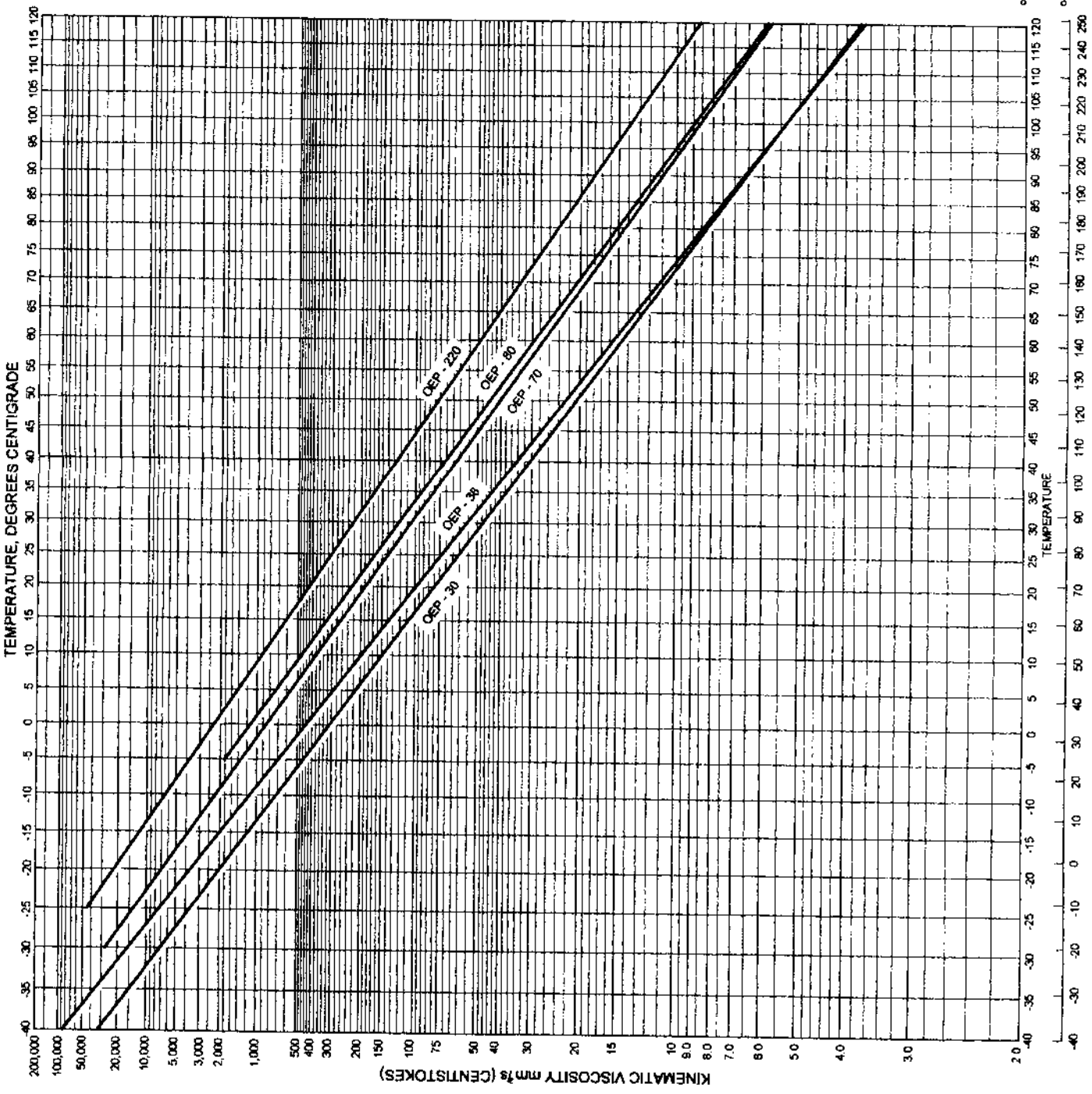


FIG 3 VISCOSITY CHARACTERISTICS : OM OILS

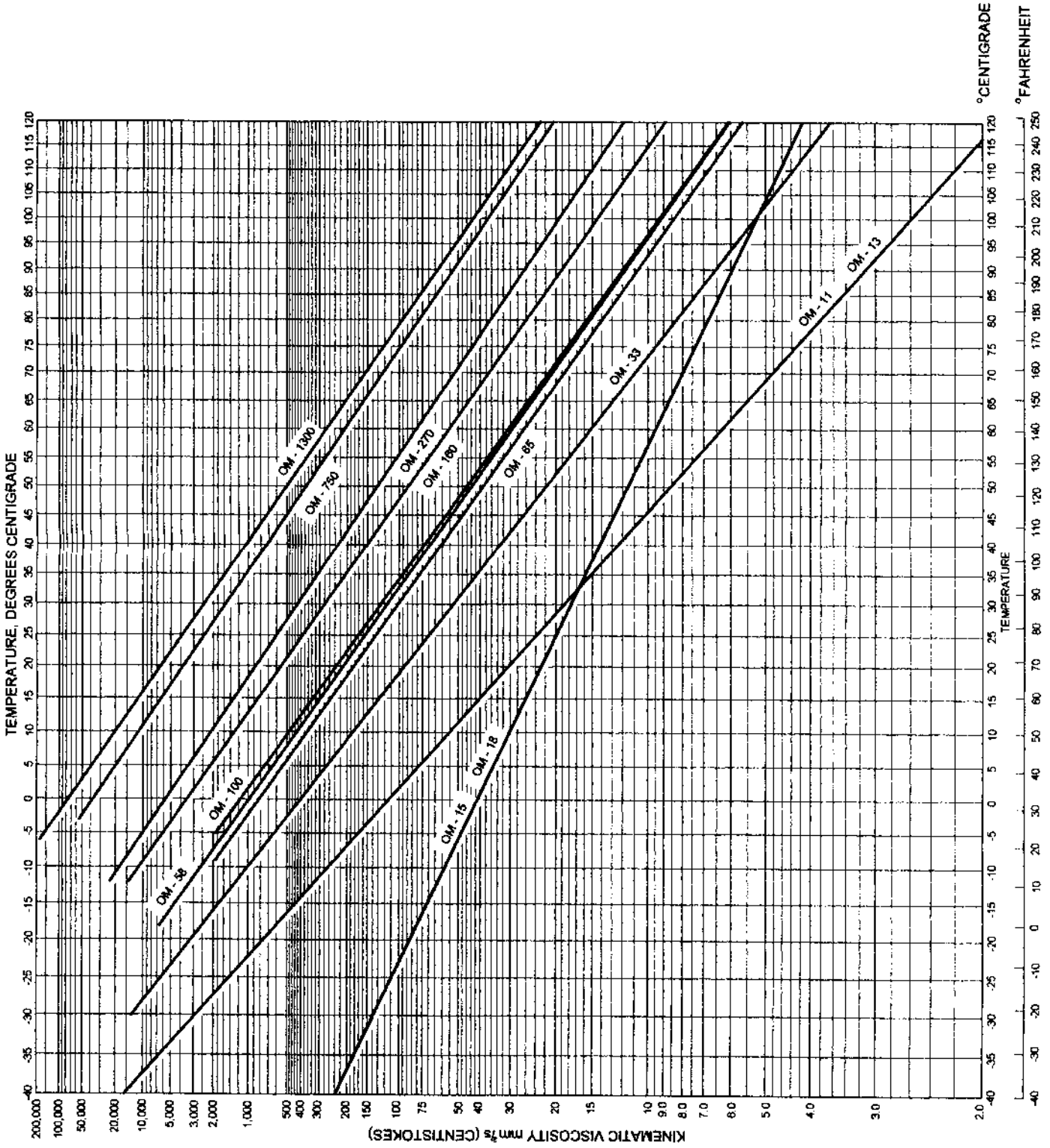


FIG 4 VISCOSITY CHARACTERISTICS : OMD OILS

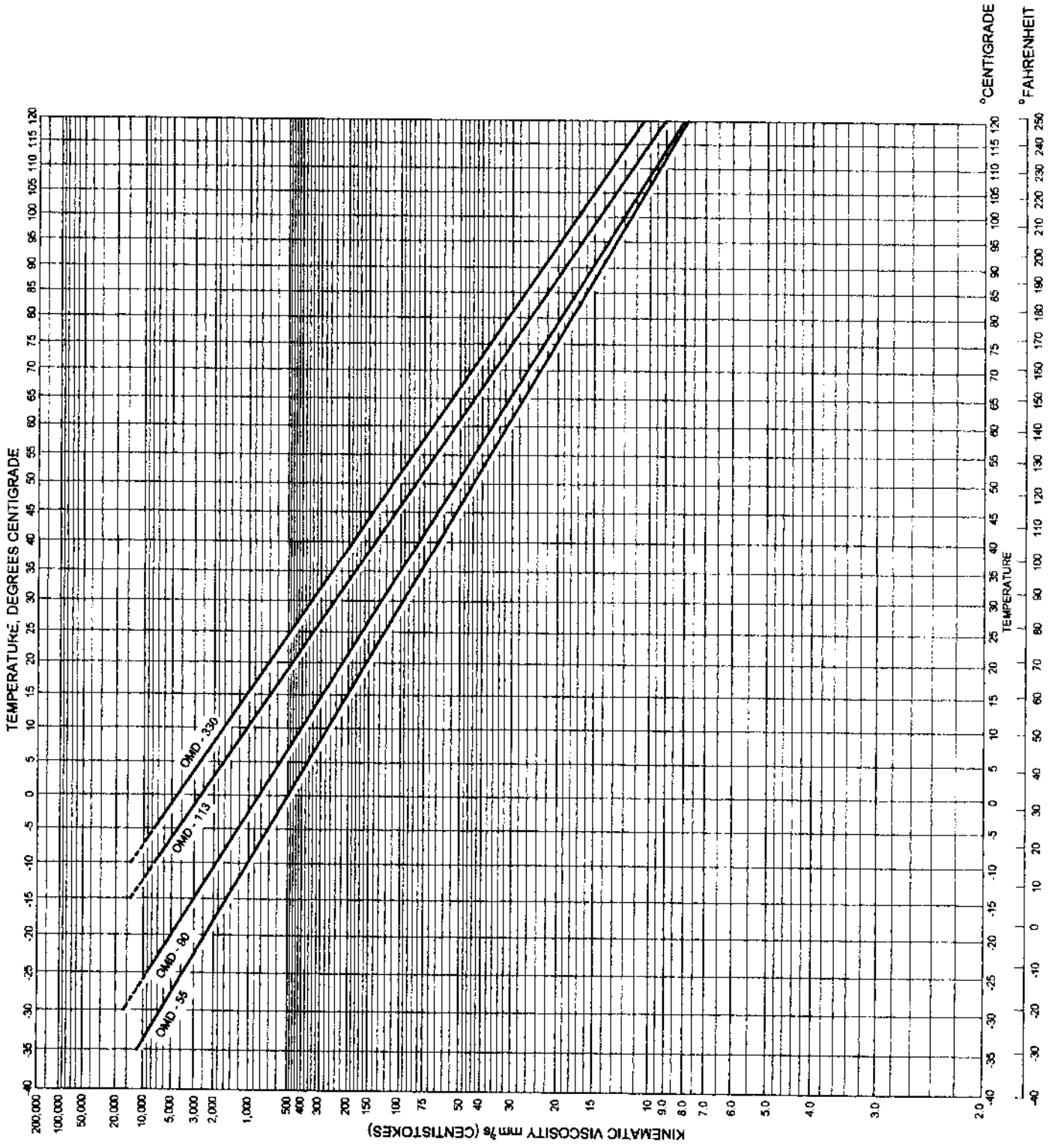
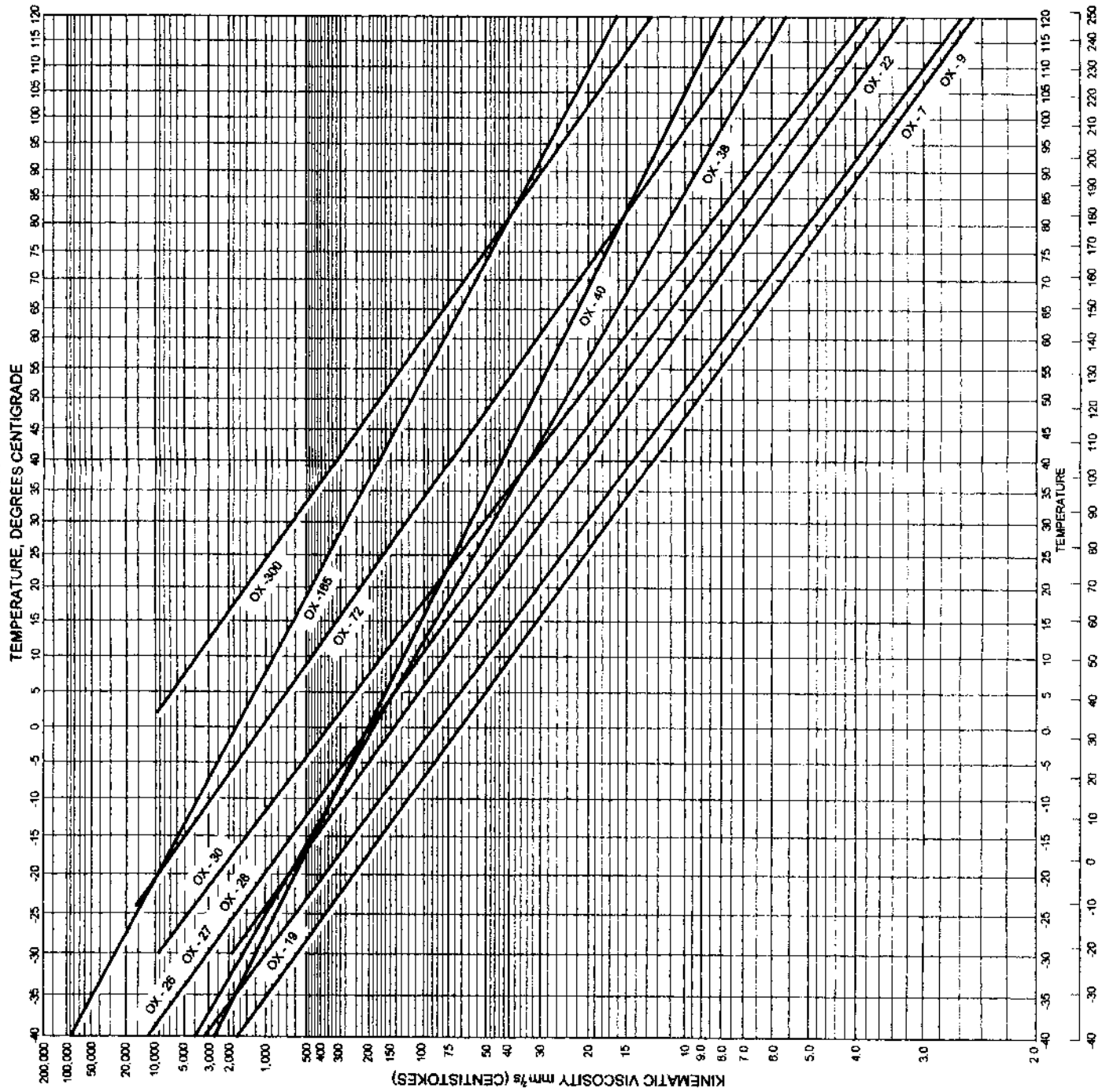


FIG 5 VISCOSITY CHARACTERISTICS : OX OILS



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