

# BARDEN

A New Level of Performance in  
Angular Contact Spindle Bearings



**BARDEN  
PRECISION  
BEARINGS**



# Barden Angular Contact Spindle Bearings Meet ABEC 9 Precision Tolerances

Barden has always dedicated itself to manufacturing the finest precision bearings in the business. Now, that level of performance has been enhanced.



Control of ball geometry helps reduce bearing vibration levels.

This means that Barden precision bearings provide maximum quality and maximum fit control allowing you to achieve optimum running conditions in your machines. Better machine performance means better parts, longer operating and tool life, and more productivity. And, all this is available as part of Barden's standard product offering — at *no additional cost*.

## Going Beyond ABEC 9

The greater the reduction in bearing component tolerances, i.e. upgrading from an ABEC 7 to an ABEC 9 — in conjunction with better ball



The unique, Barden-designed "Quiet Bearing Analyzer" allows functional testing of bearings at thrust loads rated well beyond those of commercially available bearing testers.

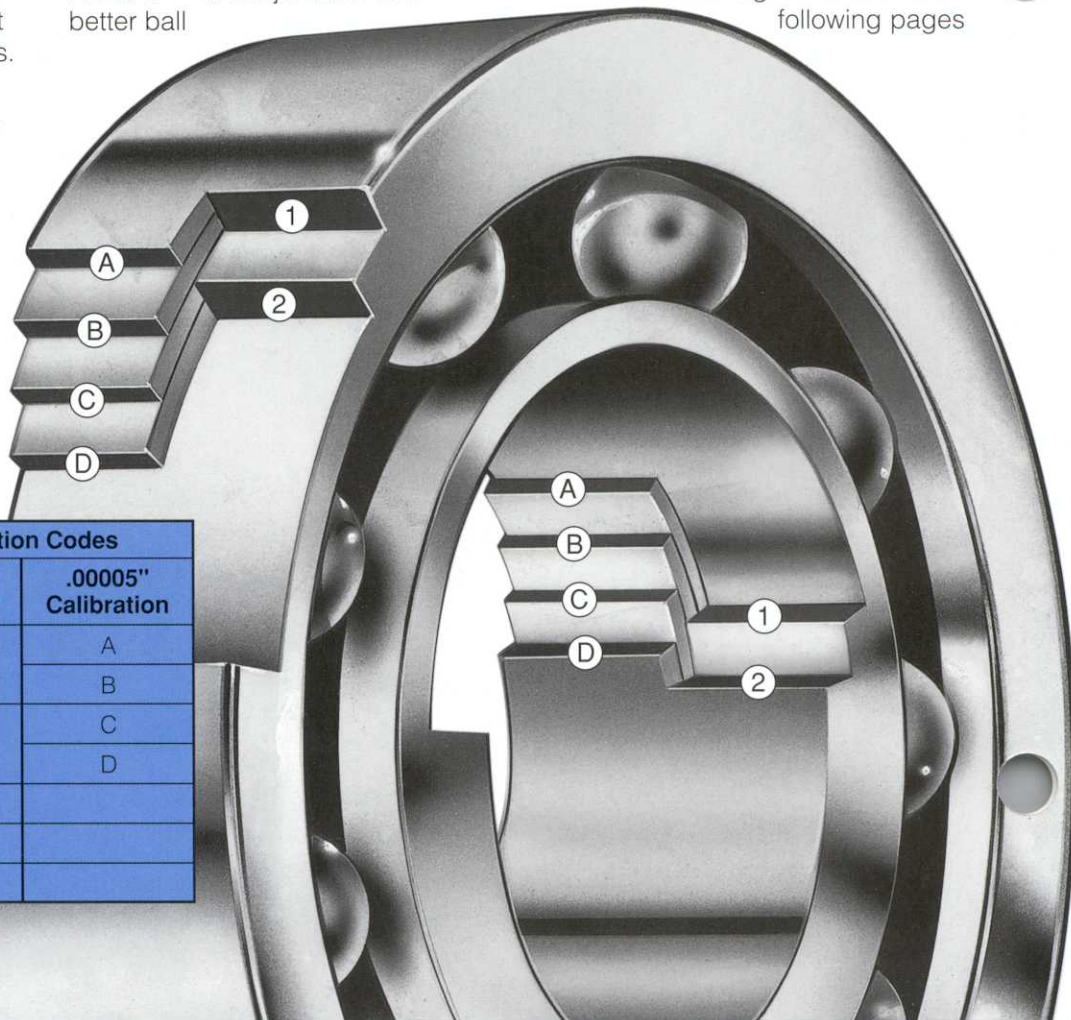
geometry, improved cleanliness, proper cage design and smoother surface finish — the quieter a bearing runs. Less rolling element resistance means less noise, vibration and heat build up. Cooler and quieter bearings simply perform better and last longer.

The eight charts on the following pages

- All Barden angular contact spindle bearings meet stringent ABEC 9 performance tolerances.
- Barden continues to offer the same range of bores and OD's, now precisely calibrated.
- Barden's standards for surface finish, ball quality and cleanliness — already above the industry norm — have been made even more stringent.

**Table/Figure 1.** Calibration codes for all Barden Angular Contact Spindle Bearings. Numbers are used for calibrations in increments of one ten-thousandths. Letters indicate calibrations of fifty-millionths (which apply to tolerances of .0002" or less).

Barden Bore and O.D. Calibration Codes		
Size Tolerance (from nominal)	.0001" Calibration	.00005" Calibration
Nominal to -.00005"	1	A
-.00005" to -.00010"		B
-.00010" to -.00015"	2	C
-.00015" to -.00020"		D
-.00020" to -.00030"	3	
-.00030" to -.00040"	4	
-.00040" to -.00050"	5	





compare the differences between ABEC 7 and ABEC 9 tolerances for inner and outer rings in the areas of squareness, radial runout, parallelism and groove wobble. Reductions in tolerance between ABEC 7 and ABEC 9 bearing geometry range from 30% up to 60%, a significant and dramatic increase in quality levels.



*BARDEN PRECISION angular contact machine tool spindle bearings run cooler and faster than ordinary bearings. Among the many benefits are longer tool life and increased productivity.*

## Low Noise, Low Vibration

Our Precision Bearings meet — or exceed — the requirements for vibration levels set by the major automotive companies' manufacturing needs, as well as the low noise "quiet running" standards of the U. S. Navy. In fact, Barden is the

only bearing manufacturer ever to be certified by the U.S. Navy to self-inspect bearings shipped per NT4 limits under MIL-B-17931E specifications.

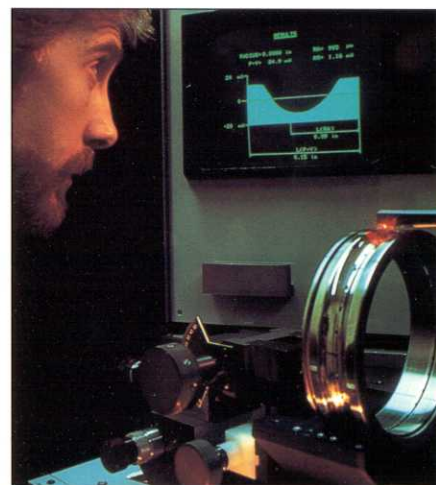
Barden meets these expectations by adhering to strict manufacturing and cleanliness guidelines; pioneering manufacturing and inspection techniques, and through better design — like our patented phenolic cage that actually prolongs grease life, and eliminates cage squeal.

Barden's strict adherence to the highest of manufacturing standards results in the production of better bearings. No ball bearing standards in the world today are tougher to meet than ours. By specifying *BARDEN PRECISION* angular contact spindle bearings, you can:

- help boost running speeds
- lower operating temperatures
- extend grease and tool life.

All this means improved machine performance — i.e. greater accuracy and better workpiece finish characteristics.

Barden has an extensive range of technical literature on a wide variety of subjects available upon request. Items include a guide to Handling and Mounting Ball Bearings, a wall chart reference with color photos that allows quick identification of the causes of bearing failure, and our popular

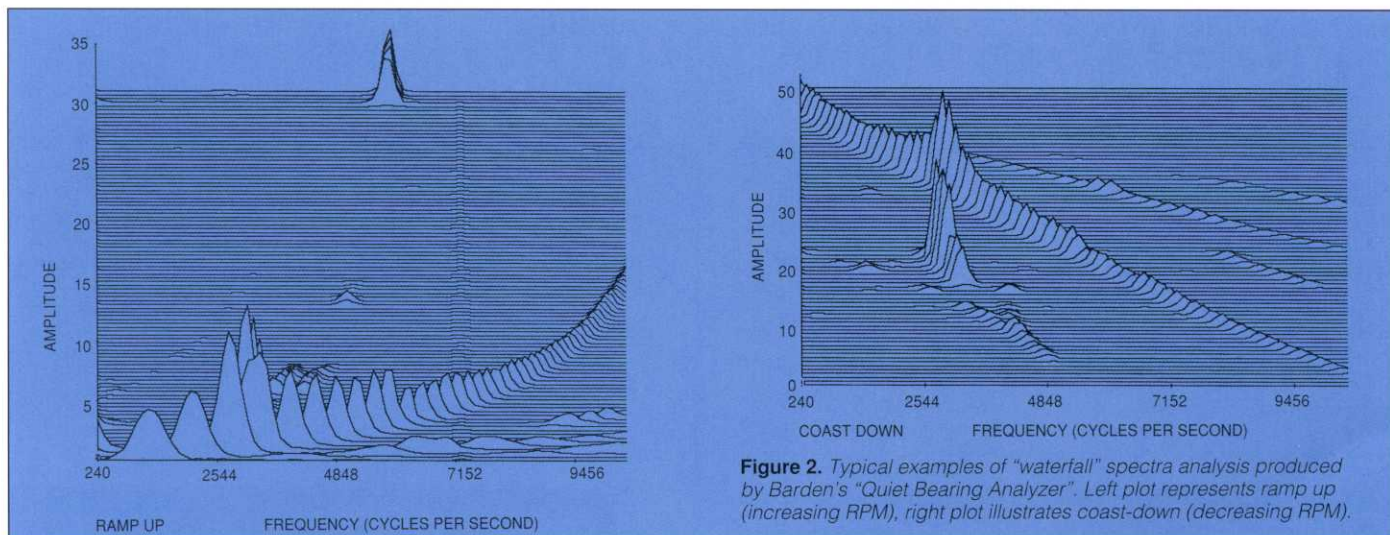


*Polarized laser beam linked to a computer is used to measure race curvature to within a half millionth of an inch and surface resolution to within two-tenths of a millionth of an inch. Precise measurement of raceway curvature ensures low vibration levels.*

Precision Bulletin series of technical updates. For copies, or for more information, contact your nearest Authorized Barden Distributor, your Barden Sales Engineer, or call Barden direct at (800) 243-1060.

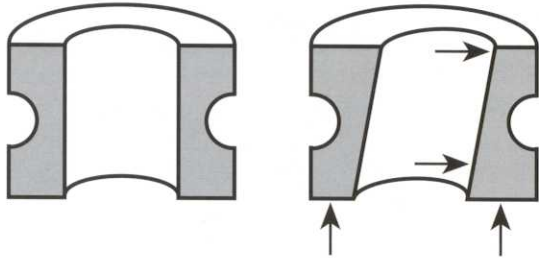


*Technical literature is available from Barden on topics like cage design, calibration, identifying causes of bearing failure and the use of ceramic hybrids. Ask your Barden representative for details.*

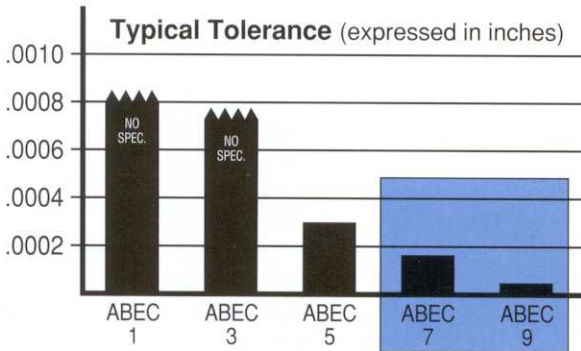


**Figure 2.** Typical examples of "waterfall" spectra analysis produced by Barden's "Quiet Bearing Analyzer". Left plot represents ramp up (increasing RPM), right plot illustrates coast-down (decreasing RPM).

# BORE SQUARENESS



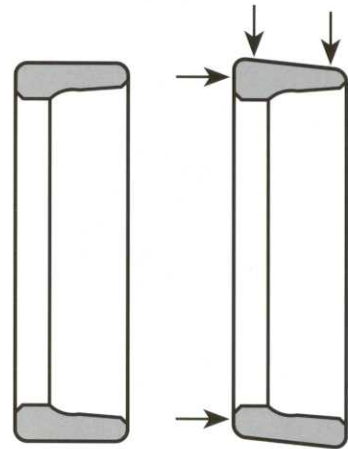
Bore Runout With Side



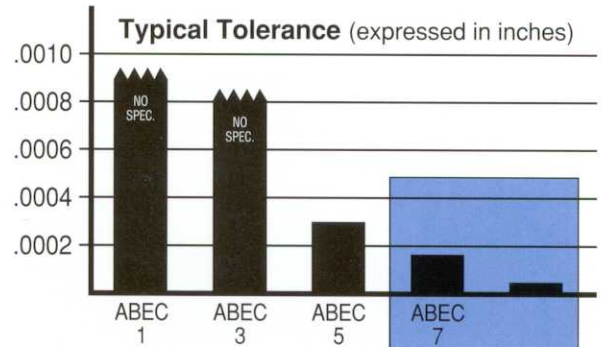
Bore in mm		ABEC-7	ABEC-9
Over	Including		
10	18	1.0	0.5
18	30	1.5	0.5
30	50	1.5	0.5
50	80	2.0	0.5
80	120	2.0	1.0
120	150	2.5	1.0

**60% REDUCTION IN TOLERANCE**

# O.D. SQUARENESS



O.D. Runout With Side

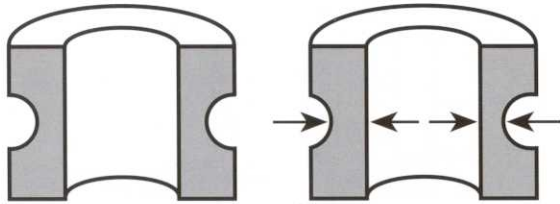


O.D. in mm		ABEC-7	ABEC-9
Over	Including		
18	30	1.5	0.5
30	50	1.5	0.5
50	80	1.5	0.5
80	120	2.0	1.0
120	150	2.0	1.0
150	180	2.0	1.0
180	250	3.0	1.5

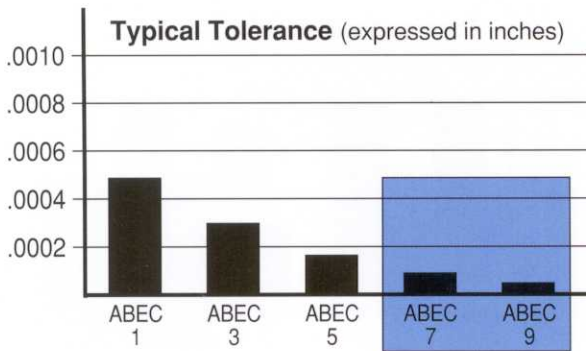
**55% REDUCTION IN TOLERANCE**



# RADIAL RUNOUT



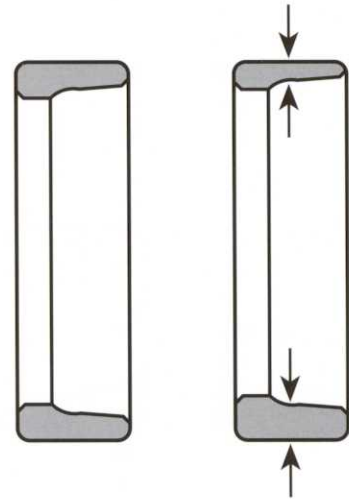
Race Runout With Bore



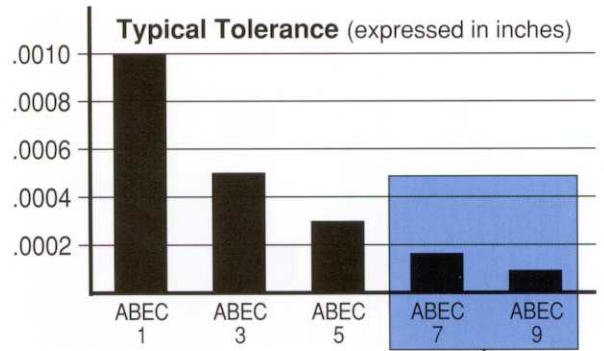
Bore in mm		ABEC-7	ABEC-9
Over	Including		
10	18	1.0	0.5
18	30	1.0	1.0
30	50	1.5	1.0
50	80	1.5	1.0
80	120	2.0	1.0
120	150	2.5	1.0

**40% REDUCTION IN TOLERANCE**

# RADIAL RUNOUT



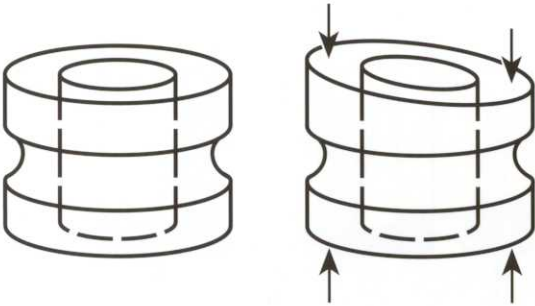
Race Runout with O.D.



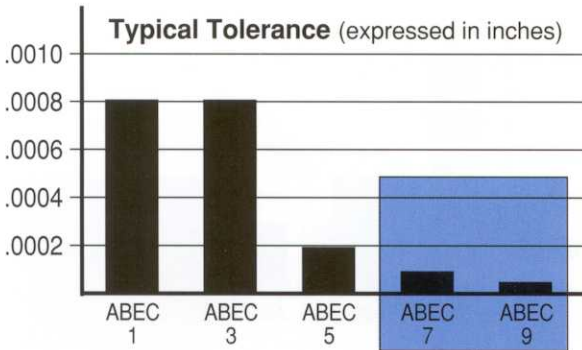
O.D. in mm		ABEC-7	ABEC-9
Over	Including		
18	30	1.5	1.0
30	50	2.0	1.0
50	80	2.0	1.5
80	120	2.5	2.0
120	150	3.0	2.0
150	180	3.0	2.0
180	250	4.0	3.0

**30% REDUCTION IN TOLERANCE**

# PARALLELISM



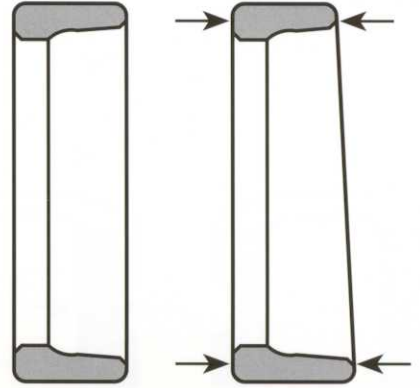
Width Variation



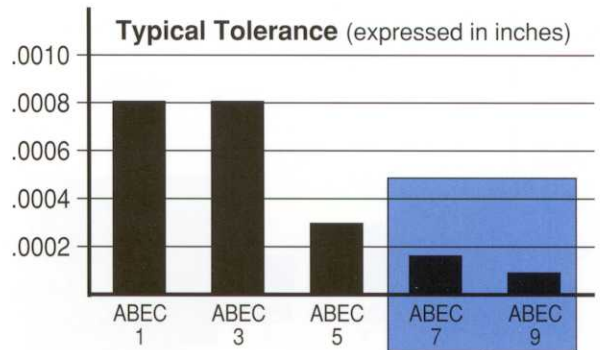
Bore in mm		ABEC-7	ABEC-9
Over	Including		
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18	30	1.0	0.5
30	50	1.0	0.5
50	80	1.5	0.5
80	120	1.5	1.0
120	150	2.0	1.0

**50% REDUCTION IN TOLERANCE**

# PARALLELISM



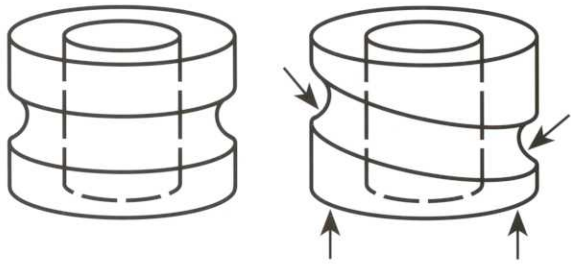
Width Variation



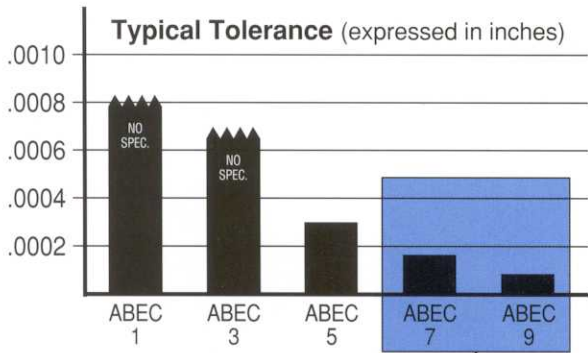
O.D. in mm		ABEC-7	ABEC-9
Over	Including		
18	30	1.0	0.5
30	50	1.0	0.5
50	80	1.0	0.5
80	120	1.5	1.0
120	150	2.0	1.0
150	180	2.0	1.0
180	250	3.0	1.5

**50% REDUCTION IN TOLERANCE**

# GROOVE WOBBLE



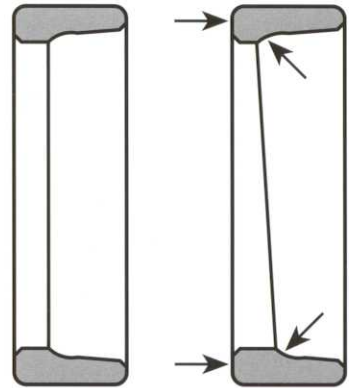
Race Runout With Side



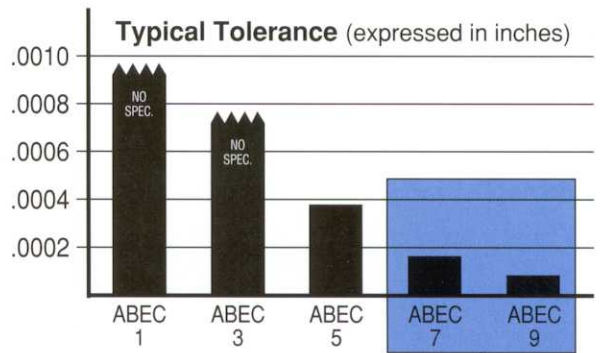
Bore in mm		ABEC-7	ABEC-9
Over	Including		
10	18	1.0	0.5
18	30	1.5	1.0
30	50	1.5	1.0
50	80	2.0	1.0
80	120	2.0	1.0
120	150	3.0	1.0

**50% REDUCTION IN TOLERANCE**

# GROOVE WOBBLE



Race Runout With Side



O.D. in mm		ABEC-7	ABEC-9
Over	Including		
18	30	2.0	1.0
30	50	2.0	1.0
50	80	2.0	1.5
80	120	2.5	2.0
120	150	3.0	2.0
150	180	3.0	2.0
180	250	4.0	3.0

**33% REDUCTION IN TOLERANCE**



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