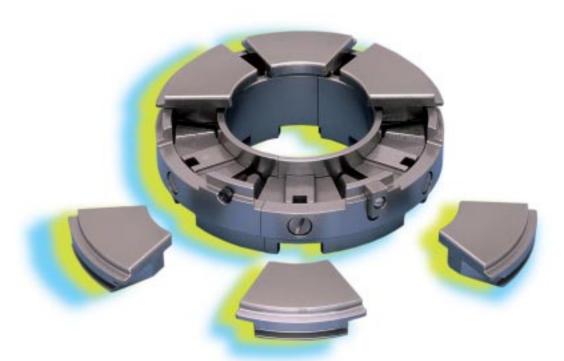
# W2000

# A NEW ERA OF VALUE IN THRUST BEARINGS



Waukesha Bearings is pleased to bring you a new choice in self-equalizing thrust bearing assemblies and parts. Comparable in form, fit and function to Kingsbury's J-Style™ and B-Style™ thrust bearings, our W2000 bearings are available in a range of size, material, instrumentation and rotation options to meet all of your assembly and part needs. All Waukesha Bearing's W2000 parts are interchangeable with your existing Kingsbury J-Style™ and B-Style™ bearings.

# A new age value in an age old part

For years you may have been ordering Kingsbury's J-Style<sup>™</sup> and B-Style<sup>™</sup> thrust bearings without giving them much thought. But now Waukesha Bearings gives you a new option. W2000 assemblies and parts offer the performance features you've come to expect in these style thrust bearings at a competitive price.

## A perfect fit at a preferred price

Every W2000 bearing assembly and part is precision engineered to fit the Kingsbury J-Style<sup>TM</sup> or B-Style<sup>TM</sup> thrust bearing application for which it's designed. That means you can trust the entire W2000 line to perform as expected every time whether you need a full assembly or an interchangeable part. The only difference you'll notice with W2000 assemblies and parts is competitive pricing.

#### What program can we build for you?

At Waukesha Bearings, we want to be your thrust bearing supplier now and into the future. Let us assemble a program that meets your unique needs. Remember, you're always assured of quality bearing assemblies and parts that are comparable in form, fit and function to Kingsbury J-Style  $^{\rm TM}$  & B-Style  $^{\rm TM}$  parts — whether you need a full assembly or an interchangeable part. And best of all, we offer a competitive price.

#### A fresh start for a standard part

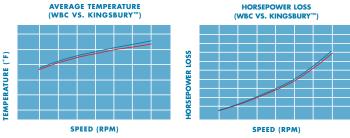
Make the change to W2000 bearing assemblies and parts and discover quality parts and competitive pricing. Call **262/506-3000** today and talk to a Waukesha Bearings technical sales representative.

# W2000 TILT PAD THRUST BEARING PRODUCT SPECIFICATIONS

& How to Order Assemblies, parts and pads

Waukesha Bearings W2000 Bearing is a self-equalizing tilting pad thrust bearing designed to compensate for shaft misalignment encountered during normal high speed machinery operation.

	Standard Features
Number of Pads	6
Pad Backing Material	Low Carbon Steel
Babbitt Material	ASTM B-23 Grade 2
Retainer Material	High Alloy Carbon Steel
Leveling Link Material	High Alloy Carbon Steel
Link Hardness	45-50 Rc
Pivot Material	High Alloy Carbon Steel
Pivot Hardness	50-55 Rc
Pivot Offset From Leading Edge	50%
Pivot Style	Button
Anti-Rotation Device	Radial Pin



Interchangeability tests of Waukesha Bearings vs. Kingsbury™

J- Style™ thrust bearing for average temperature and power loss.

#### **Custom Options**

- Chromium-Copper backing material for pads
- Offset pivot: 65% from leading edge
- Retained pads
- Temperature measurement instrumentation—RTD and TC
- Oil control ring
- Oil seal ring
- Oil groove in thrust collar
- Large bore
- Standard stack height (J style) or short stack height (B style)
- Shim plate and shim pack
- Sizes 4" through 15" available

#### **Size Availability**

- Sizes 4" through 15" available
- Please contact us for size requirements larger than 15"

#### HOW TO ORDER W2000 ASSEMBLIES & PADS

Determining the W2000 assembly or pad that's right for you is easy when you follow the simple steps outlined here. To create your custom part number, you'll need to identify your desired option in the tables following. Each option is assigned a number which when combined with the other option numbers will form your final part number.

#### **Ordering Steps - Assemblies**

- 1. Select bearing stack height, bearing type and shaft diameter. (One choice from Tables A1 or A2)
- 2. Select assembly style. (One choice from Table B)
- 3. Select pad material option. (One choice from Table C)
- 4. Select pad configuration option. (One choice from Table D)
- 5. Select rotation option. (One choice from Table E)
- 6. Select instrumentation option. (One choice from Table F)
- 7. Select number of pads instrumented per bearing side. (One choice from Table G)
- 8. Review your final part number for accuracy.

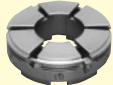
#### **Assembly Part Number Examples:**

wcw04 = 4" standard stack height double thrust bearing w/collar (Table A1 or A2)

c = copper pads (Table C)

c = copper pads (Table C)

c = copper pads (Table C)



S = standard bore (Table B)

PA = 100 ohm +/-0.36% at 0°C, platinum element 3 lead, 144" length, lead wires individually Teflon coated w/stainless steel overbraid (Table F)

**C** = clockwise side instrumented (Table E)

& How to Order Assemblies, parts and pads

#### **Ordering Steps - Pads\***

- 1. Select part size and type. (One choice from Table H)
- 2. Select bore size. (One choice from Table B)
- 3. Select pad material option. (One choice from Table C)
- 4. Select pad configuration option. (One choice from Table D)
- 5. Select rotation option. (One choice from Table E)
- 6. Select instrumentation option. (One choice from Table F)
- 7. Review your final part number for accuracy.
- \* The pad part number you create is for one pad. Please note that six pads equals one set. Call for availability/delivery of copper pads.

# Pad Part Number Example: JU = J junction type thermocouple, iron-constantan, ungrounded 144" length, lead wires individually Teflon coated w/stainless steel overbraid (Table F) C = clockwise rotation P04 = 4'' single pad (Table E) (Table H) I = drilled, instrumented pads (Table D) **S** = steel pads (Table C)

**S** = standard bore (Table B)

Table A1 - Type of Bearing Standard Stack Height* Assembly Type				
Pad Outside Diameter	Single Thrust Bearing	Single Thrust w/Collar	Double Thrust Bearing	Double Thrust w/Collar
4"	W04	WC04	WW04	WCW04
5"	W05	WC05	WW05	WCW05
6"	W06	WC06	WW06	WCW06
7"	W07	WC07	WW07	WCW07
8"	W08	WC08	WW08	WCW08
9"	W09	WC09	WW09	WCW09
10.5"	W10	WC10	WW10	WCW10
12"	W12	WC12	WW12	WCW12
15"	W15	WC15	WW15	WCW15

	Ų		0	
4"	W04	WC04	WW04	WCW04
5"	W05	WC05	WW05	WCW05
6"	W06	WC06	WW06	WCW06
7"	W07	WC07	WW07	WCW07
8"	W08	WC08	WW08	WCW08
9"	W09	WC09	WW09	WCW09
10.5"	W10	WC10	WW10	WCW10
12"	W12	WC12	WW12	WCW12
15"	W15	WC15	WW15	WCW15
*For reference specifications, refer to Table N.				
Table A2 - Type of Bearing				
Short Stack Height* Assembly Type				

Table A2 - Type of Bearing  Short Stack Height* Assembly Type				
Short Stac	k Height*	Asse	mbly Type	
Pad Outside	Single Thrust	Single Thrust	Double Thrust	Double Thrust
Diameter	Bearing	w/Collar	Bearing	w/Collar
4"	D04	DC04	DD04	DCD04
5"	D05	DC05	DD05	DCD05
6"	D06	DC06	DD06	DCD06
7"	D07	DC07	DD07	DCD07
8″	D08	DC08	DD08	DCD08
9"	D09	DC09	DD09	DCD09
10.5"	D10	DC10	DD10	DCD10
12"	D12	DC12	DD12	DCD12
15"	D15	DC15	DD15	DCD15
*For reference specifications, refer to Table O.				

Standard Bore	Large Bore	No Pads
S	L	N99*

Table C - Pad Material Options		
Steel Pads	Copper Pads*	
S C		
*Call for availability/delivery of copper pads.		

Table D - Pad Configuration Options		
I	Drilled, instrumented pads	
Ν*	Not drilled, not instrumented pads	
D**	Drilled, not instrumented pads	

- \* If you choose option N, your part number is complete. Proceed to step 8.
- \*\* If you choose option D, proceed to Table E and make your selection. Then, add "XX" to your part number, skip table and make your final selection from Table G.

Table E - Rotation Options		
С	Clockwise rotation	
W	Counter-clockwise rotation	
В	Cw/ccw rotation (use for double bearing with drilled and/or instrumented pads only.)	

Table G - # of Pads Drilled and/or **Instrumented Per Bearing Side** Two Drilled and/or One Drilled and/or Instrumented Instrumented

Table H -	Parts / Pads		
Diameter	Single Pad	Diameter	Single Pad
4"	PO4	9"	P09
5"	PO5	10.5"	P10
6"	P06	12"	P12
7"	PO7	15"	P15
8″	PO8		

# **Table F - Pad Instrumentation Options**

#### **RTDs - Pads drilled for instrumentation** with RTD provided

- PA 100 ohm +/-0.36% at 0°C, .00392  $\Omega/\Omega/^{\circ}$ C TCR, platinum element 3 lead, 144" length, lead wires individually Teflon coated w/stainless steel overbraid (meets API standard 670)
- PD 100 ohm +/-0.12% at 0°C, .00385  $\Omega/\Omega/^{\circ}$ C TCR, platinum element 3 lead, 144" length, lead wires individually Teflon coated w/stainless steel overbraid (meets DIN and IEC, class B)

#### T/C's - Pads drilled for instrumentation with thermocouple provided

- Junction type thermocouple, iron-constantan, ungrounded 144" length, lead wires individually Teflon coated w/stainless steel overbraid (Note: The grounded J junction type thermocouple meets API standard 670)
- JG J junction type thermocouple, iron-constantan, grounded 144" length, lead wires individually Teflon coated w/stainless steel overbraid (Note: The grounded J junction type thermocouple meets API standard 670)
- TU T junction type thermocouple, copper-constantan, ungrounded 144" length, lead wires individually Teflon coated w/stainless steel overbraid
- TG T junction type thermocouple, copper-constantan, grounded 144" length, lead wires individually Teflon coated w/stainless steel overbraid

All RTDs and TCs are Minco short height case style B spring loaded.

#### HOW TO ORDER W2000 PARTS

Custom collar part numbers can be created following the simple steps below. To order other parts, simply find your desired part from charts J1-M.

## **Ordering Steps - Collars**

- 1. Select part size and type (One choice from Table I)
- 2. Select bore size (One choice from Table B)
- 3. Review your final part number for accuracy

**Example:** 



**CO4**= 4" single collar (Table I) **S** = standard bore (Table B)

Table I - Parts/Collars*		
Diameter	Single Collar	
4"	C04	
5"	C05	
6"	C06	
7"	C07	
8"	C08	
9"	C09	
10.5"	C10	
12"	C12	
15"	C15	
*For reference specifications, refer		

to Tables P1 and P2

/Collars*	Table J1 - Parts/Upper Links*		Table J2 - Par	ts/Lower Links*
gle Collar	Diameter	Upper Links	Diameter	Lower Links
C04	4"	ULO4	4"	LLO4
C05	5"	ULO5	5"	LLO5
C06	6"	ULO6	6"	LLO6
C07	7"	ULO7	7"	1107
C08	8"	ULO8	8"	LLO8
C09	9"	ULO9	9"	LLO9
C10	10.5"	UL10	10.5"	LL10
C12	12"	UL12	12"	LL12
C15	15"	UL15	15"	LL15
ications, refer	*One complete set of links includes		*One complete set	of links includes
	six (6) upper links and six (6) lower links.		six (6) upper links of	and six (6) lower links

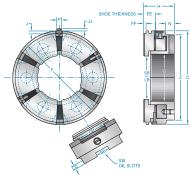
Table K1 - Parts/Retaining Rings Standard Stack Height		
Diameter	<b>Retaining Rings</b>	
4"	WRRO4	
5"	WRRO5	
6"	WRR06	
7"	WRR07	
8"	WRR08	
9"	WRR09	
10.5"	WRR10	
12"	WRR12	
15"	WRR15	

Table K2 - Parts/Retaining Rings Short Stack Height									
Diameter	<b>Retaining Rings</b>								
4"	DRRO4								
5"	DRRO5								
6"	DRRO6								
7"	DRRO7								
8"	DRRO8								
9"	DRRO9								
10.5"	DRR 10								
12"	DRR12								
15"	DRR15								

Table L - Part	Table L - Parts/Oil Control Rings*								
Diameter	Oil Control Rings								
4"	OCR04								
5"	OCR05								
6"	OCR06								
7"	OCR07								
8"	OCR08								
9"	OCR09								
10.5"	OCR10								
12"	OCR12								
15"	OCR15								
*Call for availabi	lity of oil control rings.								

Table M - Parts/Shim Kits*								
Diameter	Shim Kits							
4"	SKO4							
5"	SKO5							
6"	SK06							
7"	SK07							
8"	SK08							
9"	SK09							
10.5"	SK10							
12"	SK12							
15"	SK15							
*Call for availability of shim kits.								

#### STANDARD STACK HEIGHT SPECIFICATIONS SHORT STACK HEIGHT



			9	oi	L SLOTS					
Table N - W Type Bearings - Standard Stack Height  Bearing Size 4 5 6 7 8 9								10.5	12	15
	a (Net In²)	8	12.5	18.0	24.5	31.4	40.5	55.1	72.0	112.5
Weight	W-Bearing	3.5	6	9.8	16	22.5	32.5	48.7	70.3	138.5
(Lbs.)	Thrust Collar	3	4.5	7.5	12.5	17.5	23.6	37.7	56	108
Net	6 - Spare Pads	1.1	2.1	3.5	5.5	7.75	11.2	18	25	47
C - (Bore of	Housing)	4.375	5.375	6.375	7.375	8.375	9.375	11.000	12.500	15.500
F - (Nominal)	F - (Nominal)		5.00	6.00	7.00	8.00	9.00	10.50	12.00	15.00
Н	Н		1.75	2.06	2.38	2.69	3.00	3.38	3.75	4.62
J		0.12	0.16	0.19	0.25	0.31	0.31	0.34	0.41	0.56
JJ		0.12	0.16	0.19	0.19	0.19	0.19	0.22	0.22	0.31
N		0.38	0.50	0.56	0.69	0.81	0.88	1.00	1.19	1.38
NN		0.28	0.31	0.38	0.47	0.50	0.56	0.62	0.69	0.81
Р		0.25	0.31	0.38	0.38	0.44	0.44	0.50	0.56	0.69
Q	Q		2.75	3.25	3.75	4.31	4.88	5.69	6.50	8.12
Z		4.12	4.94	5.94	6.75	7.62	8.62	10.00	11.56	14.50
BB - Oil Slot	Width	0.81	0.62	0.81	0.88	1.25	1.50	1.75	2.00	2.19
CC - Oil Slot	Depth	0.19	0.28	0.38	0.44	0.53	0.50	0.69	0.66	0.88

0.16

3.00

0.19

1.969 2.344 <mark>2.719</mark> 3.031 3.187 3.969 **5.094** 

4.00 4.50

0.31

3.25 3.75 **4.31** 4.88 5.69 6.50 **8.12** 

0.28 0.34 0.12

5.25 6.00 7.50

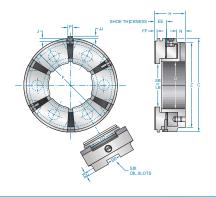


Table O - D Type Bearings - Short Stack Height										
Bea	ring Size	4	5	6	7	8	9	10.5	12	15
Area	a (Net In²)	8	12.5	18.0	24.5	31.4	40.5	55.1	72.0	112.5
Weight	D-Bearing	3.5	6	9.8	16	22.5	32.5	48.7	70.3	138.5
(Lbs.)	Thrust Collar	3	4.5	7.5	12.5	17.5	23.6	37.7	56	108
Net	6 - Spare Pads	1.1	2.1	3.5	5.5	7.8	11.2	18	25	47
C - (Bore of	Housing)	4.375	5.375	6.375	7.375	8.375	9.375	11.000	12.500	15.500
F - (Nominal	)	4.00	5.00	6.00	7.00	8.00	9.00	10.50	12.00	15.00
Н		1.38	1.62	1.85	2.12	2.38	2.69	2.94	3.25	3.88
J		0.12	0.16	0.19	0.25	0.31	0.31	0.34	0.41	0.56
JJ		0.12	0.16	0.19	0.19	0.19	0.19	0.22	0.22	0.31
N		0.31	0.38	0.38	0.44	0.50	0.56	0.56	0.69	0.62
NN		0.28	0.31	0.38	0.47	0.50	0.56	0.62	0.69	0.81
Р		0.25	0.31	0.38	0.38	0.44	0.44	0.50	0.56	0.69
Q		2.19	2.75	3.25	3.75	4.31	4.88	5.69	6.50	8.12
Z		4.12	4.94	5.94	6.75	7.62	8.62	10.00	11.56	14.50
BB - Oil Slot	Width	0.81	0.62	0.81	0.88	1.25	1.50	1.75	2.00	2.25
CC - Oil Slot	Depth	0.12	0.16	0.19	0.19	0.22	0.25	0.25	0.25	0.38
DD - Shoe S	traddle Mill	1.281	1.594	1.969	2.344	2.719	3.031	3.187	3.969	5.094
EE - Shoe Thickness		0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.625
FF - Shoe Relief @ O.D		0.12	0.16	0.16	0.19	0.22	0.31	0.28	0.34	0.12
SB - (Std. Bo	ore Nominal)	2.00	2.50	3.00	3.50	4.00	4.50	5.25	6.00	7.50
LB - (Large B	Bore Nominal)	2.19	2.75	3.25	3.75	4.31	4.88	5.69	6.50	8.12

#### SPECIFICATIONS COLLAR

1.281 1.594

0.500 0.625

2.19 2.75

0.16

2.50

0.12

2.00

DD - Shoe Straddle Mill

EE - Shoe Thickness

FF - Shoe Relief @ O.D

SB - (Std. Bore Nominal)

LB - (Large Bore Nominal)

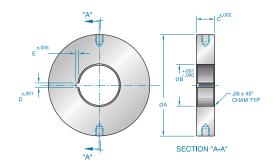


Table P1 - Standard Bore										
Bearing Size	4	5	6	7	8	9	10.5	12	15	
А	4.12	5.12	6.12	7.12	8.12	9.12	10.69	12.19	15.19	
B - (Bore)	1.250	1.750	2.125	2.500	3.000	3.500	4.125	4.750	6.000	
С	0.88	0.88	1.00	1.25	1.38	1.50	1.75	2.00	2.50	
D	0.31	0.38	0.38	0.50	0.62	0.62	0.75	0.75	1.00	
Е	0.16	0.19	0.19	0.25	0.31	0.31	0.38	0.38	0.50	

Table P2 - Large Bore											
Bearing Size	4	5	6	7	8	9	10.5	12	15		
Α	4.12	5.12	6.12	7.12	8.12	9.12	10.69	12.19	15.19		
B - (Bore)		2.000	2.375	2.750	3.250	3.750	4.500	5.125			
С	0.88	0.88	1.00	1.25	1.38	1.50	1.75	2.00	2.50		
D	0.31	0.38	0.38	0.50	0.62	0.62	0.75	0.75	1.00		
Е	0.16	0.19	0.19	0.25	0.31	0.31	0.38	0.38	0.50		