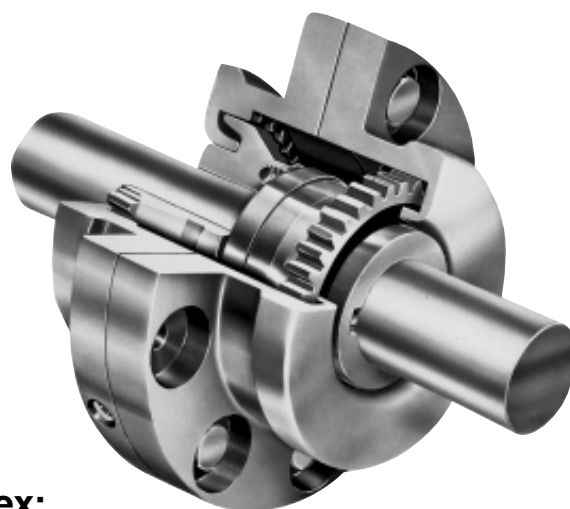


FAST'S® Gear Couplings Size 1 1/2 through 30



**The industry standard
for over 75 years**

**Unique All-Metal
End Ring Seal
designed for
maximum service life**

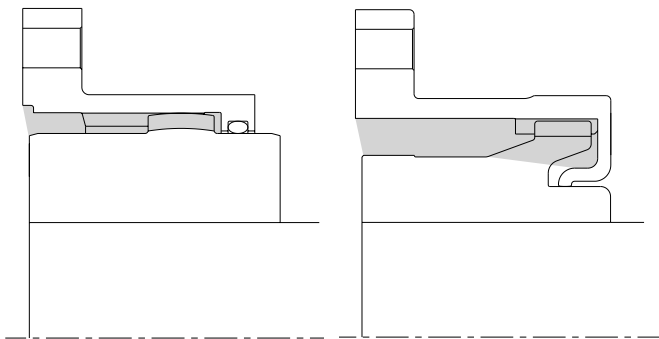
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Why Specify FAST'S® Gear Couplings?

The FAST'S design, with its lifetime **All-Metal End Ring**, provides up to **300% greater lubricant capacity**. This means that longer periods between relubrication may be scheduled, and should a periodic relubrication be overlooked, this lubricant reserve usually provides the required margin necessary to assure continued operation.

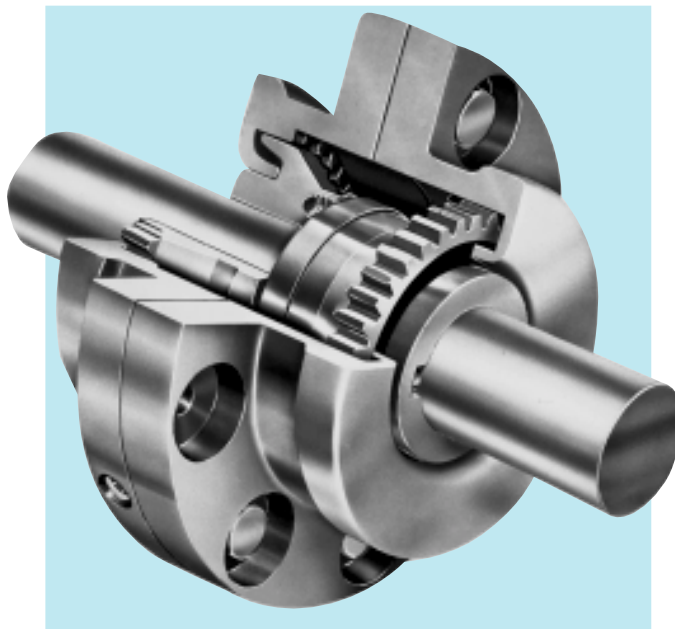
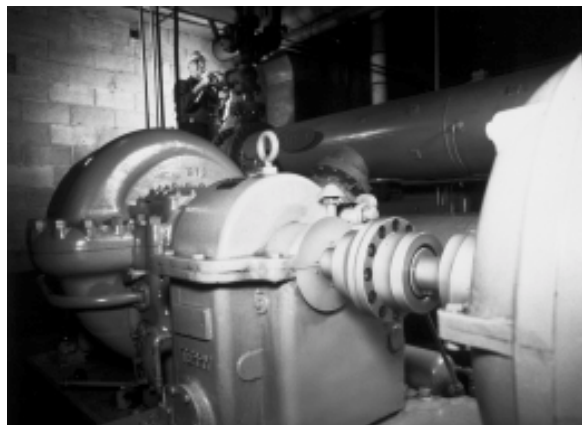
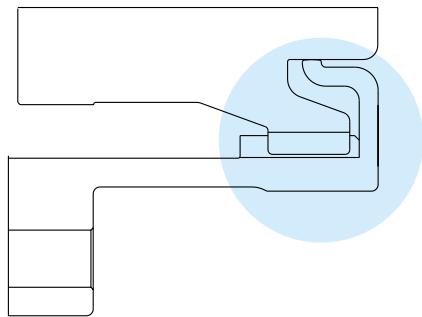


Lubricant Capacity - FAST'S vs. O-ring Style

Why Is The Design Unique?

The All-Metal End Ring, used exclusively in FAST'S couplings, eliminates the need for any type of perishable lube seal (O-rings, lip seals, cork gaskets, etc.). The end ring not only provides the dam over which lubricant must flow to escape, but it additionally pilots the sleeve with respect to the hub during start-up and shut-down operations. It further eliminates partial tooth disengagement—with resulting tooth overloads—by providing sleeve teeth which are flush against the inside wall of the end ring.

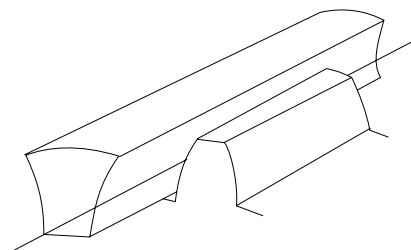
To be sure that your couplings provide Maximum Life, always specify FAST'S couplings, with the life-time All-Metal End Ring!



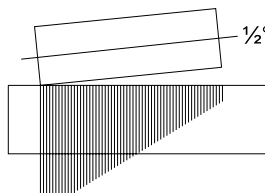
FAST'S® Gear Coupling Size 1 1/2 - 7

What Tooth Form Is Used?

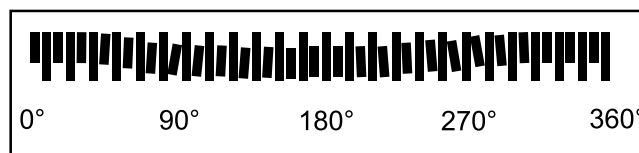
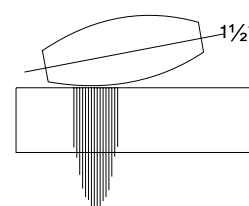
The Straight-Faced involute hub tooth form featured in the FAST'S coupling is virtually unique in the industry today. It is this tooth form that distributes tooth contact pressures across the full length of the hub tooth, best developing the needed hydrodynamic lube film, minimizing tooth wear and extending coupling life. It is the only hub tooth form available in the standard FAST'S coupling line.



Straight-Face Tooth



1 1/2° Curved Face Tooth



Tooth Motion Under Misalignment

The FAST'S Coupling

The FAST'S® gear coupling is available in two basic product lines:

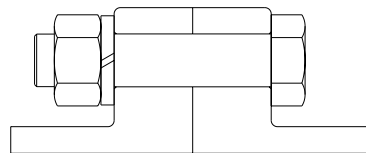
- **FAST'S coupling** for medium to heavy-duty applications.
 - Sizes 1 1/2 through 7 with integral end ring.
 - Sizes 8 through 30 with bolt-on end ring.
- **FAST'S Model B coupling** for light to medium-duty applications. Model B couplings are not interchangeable with standard FAST'S couplings.
 - Sizes 1 1/2 through 3 1/2 with integral end ring.



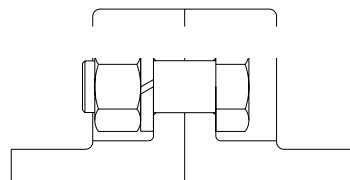
**FAST'S® Gear Coupling
Size 8-30**

Center Flange Bolting:

All KOP-FLEX couplings feature precision-drilled flange bolt holes, and tight tolerance Grade 5 flange bolts to assure a long-lasting flange to flange and fastener fit. Exposed bolt flanges are standard. Shrouded bolt flanges can be supplied through size 5. **Size #5 1/2 and larger couplings are only available with exposed bolt flanges.**



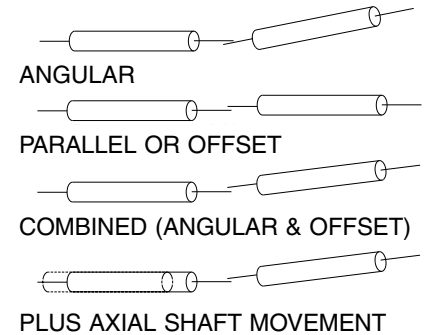
EXPOSED BOLTS



SHROUDED BOLTS



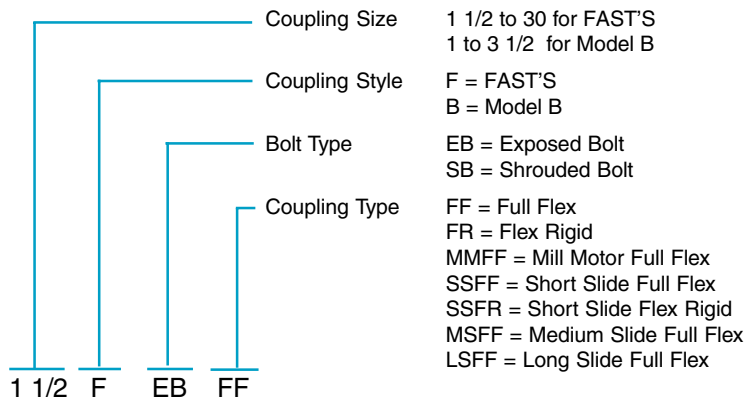
Shaft Misalignment:



Misalignment Capabilities

FAST'S couplings are designed for $\pm 1/2^\circ$ static misalignment per half coupling.

PART NUMBER EXPLANATION Complete Rough Bore Coupling



How to Order

Coupling Parts

Description

*FHUB = Flex Hub
 *RHUB = Rigid Hub
 *MMHUB = Mill Motor Hub
 *SSHUB = Short Slide Hub (Full Flex)
 *SRHUB = Short Slide Hub (Flex Rigid)
 *MSHUB = Medium Slide Hub
 *LSHUB = Long Slide Hub
 SLEEVE = Standard Sleeve
 MSSLEEVE = Medium Slide Sleeve
 LSSLEEVE = Long Slide Sleeve
 FS = Fastener Set (w/gasket)
 VSFS = Vertical/Slide Fastener Set (w/gasket)
 ERFS = End Ring Fastener Set
 LEFD = LEF Disk
 SPRxxx = Spacer for x.xx shaft separation
 SP = Stop Plate for Slide Couplings
 ERING = End Ring

* For finish bored hubs, add FB and bore size.
 All finish bores and keyways per
 AGMA 9002-A86 with interference fits.
 Clearance bores are available on request
 with one setscrew over keyway.

1 1/2F FHUB FB

Values listed are intended only as a general guide, and are typical of usual service requirements. For systems which frequently utilize the peak torque capability of the power source, verify that the magnitude of this peak torque does not exceed the 1.0 Service Factor Rating of the coupling selected. Applications which involve extreme repetitive shock or high-energy load absorption characteristics should be referred — with full particulars — to KOP-FLEX.

Values contained in the table are to be applied to smooth power sources such as electric motors and steam turbines. For drives involving internal combustion, engines of four or five cylinders, add 1.0 to the values listed, for six or more cylinders, add 0.5 to the values listed. For systems utilizing AC or DC Mill Motors as the prime mover refer to Note (1).

Application	Typical Service Factor
AGITATORS	
Pure Liquids	1.0
Liquids & Solids	1.25
Liquids — Variable Density	1.25
BLOWERS	
Centrifugal	1.0
Lobe	1.5
Vane	1.25
BRIQUETTE MACHINES	2.0
CAR PULLERS — Intermittent Duty	1.5
COMPRESSORS	
Centrifugal	1.0
Centriaxial	1.25
Lobe	1.5
Reciprocating — Multi-Cylinder	2.0
CONVEYORS — LIGHT DUTY	
UNIFORMLY FED	
Apron, Bucket, Chain, Flight, Screw	1.25
Assembly, Belt	1.0
Oven	1.5
CONVEYORS — HEAVY DUTY	
NOT UNIFORMLY FED	
Apron, Bucket, Chain, Flight, Oven	1.5
Assembly, Belt	1.25
Reciprocating, Shaker	2.5
CRANES AND HOISTS (NOTE 1 and 2)	
Main hoists, Reversing	2.5
Skip Hoists, Trolley & Bridge Drives	2.0
Slope	2.0
CRUSHERS	
Ore, Stone	3.0
DREDGES	
Cable Reels	1.75
Conveyors	1.5
Cutter Head Jig Drives	2.5
Maneuvering Winches	1.75
Pumps	1.75
Screen Drives	1.75
Stackers	1.75
Utility Winches	1.5
ELEVATORS (NOTE 2)	
Bucket	1.75
Centrifugal & Gravity Discharge	1.5
Escalators	1.5
Freight	2.5
FANS	
Centrifugal	1.0
Cooling Towers	1.5
Forced Draft	1.5
Induced Draft without Damper	
Control	2.0
FEEDERS	
Apron, Belt, Disc, Screw	1.25
Reciprocating	2.5

Application	Typical Service Factor
GENERATORS —	
(Not Welding)	1.0
HAMMER MILLS	2.0
LAUNDRY WASHERS —	
Reversing	2.0
LAUNDRY TUMBLERS	2.0
LINE SHAFT	1.5
LUMBER INDUSTRY	
Barkers — Drum Type	2.0
Edger Feed	2.0
Live Rolls	2.0
Log Haul — Incline	2.0
Log Haul — Well type	2.0
Off Bearing Rolls	2.0
Planer Feed Chains	1.75
Planer Floor Chains	1.75
Planer Tilting Hoist	1.75
Slab Conveyor	1.5
Sorting Table	1.5
Trimmer Feed	1.75
MARINE PROPULSION	
Main Drives	2.0
MACHINE TOOLS	
Bending Roll	2.0
Plate Planer	1.5
Punch Press — Gear Driven	2.0
Tapping Machines	2.5
Other Machine Tools	
Main Drives	1.5
Auxiliary Drives	1.25
METAL MILLS	
Draw Bench — Carriage	2.0
Draw Bench — Main Drive	2.0
Forming Machines	2.0
Slitters	1.5
Table Conveyors	
Non-Reversing	2.25
Reversing	2.5
Wire Drawing & Flattening Machine	2.0
Wire Winding Machine	1.75
METAL ROLLING MILLS (NOTE 1)	
Blooming Mills	*
Coilers, hot mill	2.0
Coilers, cold mill	1.25
Cold Mills	2.0
Cooling Beds	1.75
Door Openers	2.0
Draw Benches	2.0
Edger Drives	1.75
Feed Rolls, Reversing Mills	3.5
Furnace Pushers	2.5
Hot Mills	3.0
Ingot Cars	2.5
Kick-outs	2.5
Manipulators	3.0
Merchant Mills	3.0
Piercers	3.0
Pusher Rams	2.5
Reel Drives	1.75
Reel Drums	2.0
Reelers	3.0
Rod and Bar Mills	1.5
Roughing Mill Delivery Table	3.0
Runout Tables	
Reversing	3.0
Non-Reversing	2.0
Saws, hot & cold	2.5
Screwdown Drives	3.0
Skelp Mills	3.0
Slitters	3.0
Slabbing Mills	3.0
Soaking Pit Cover Drives	3.0
Straighteners	2.5
Tables, transfer & runout	2.0
Thrust Block	3.0
Traction Drive	3.0
Tube Conveyor Rolls	2.5
Unscramblers	2.5
Wire Drawing	1.5
MILLS, ROTARY TYPE	
Ball	2.25
Dryers & Coolers	2.0
Hammer	1.75
Kilns	2.0

Application	Typical Service Factor
Pebble & Rod	2.0
Pug	1.75
Tumbling Barrels	2.0
MIXERS	
Concrete Mixers	1.75
Drum Type	1.5
OIL INDUSTRY	
Chillers	1.25
Paraffin Filter Press	1.75
PAPER MILLS	
Barker Auxiliaries, Hydraulic	2.0
Barker, Mechanical	2.0
Barking Drum Spur Gear Only	2.25
Beater & Pulper	1.75
Bleacher	1.0
Calenders	2.0
Chippers	2.5
Coaters	1.0
Converting Machines, except Cutters, Platers	1.5
Couch Roll	1.75
Cutters, Platers	2.0
Cylinders	1.75
Disc Refiners	1.75
Dryers	1.75
Felt Stretcher	1.25
Felt Whipper	2.0
Jordans	1.75
Line Shaft	1.5
Log Haul	2.0
Pulp Grinder	1.75
Press Roll	2.0
Reel	1.5
Stock Chests	1.5
Suction Roll	1.75
Washers & Thickeners	1.5
Winders	1.5
PRINTING PRESSES	1.5
PULLERS — Barge Haul	2.0
PUMPS	
Centrifugal	1.0
Boiler Feed	1.5
Reciprocating	
Single Acting	
1 or 2 Cylinders	2.25
3 or more Cylinders	1.75
Double Acting	2.0
Rotary, Gear, Lobe, Vane	1.5
RUBBER INDUSTRY	
Mixer — Banbury	2.5
Rubber Calendar	2.0
Rubber Mill (2 or more)	2.25
Sheeter	2.0
Tire Building Machines	2.5
Tire & Tube Press Openers	1.0
Tubers & Strainers	2.0
SCREENS	
Air Washing	1.0
Grizzly	2.0
Rotary — Stone or Gravel	1.5
Traveling Water Intake	1.25
Vibrating	2.5
SEWAGE DISPOSAL EQUIPMENT	
Bar Screens	1.25
Chemical Feeders	1.25
Collectors, Circuline or Straightline	1.25
Dewatering Screens	1.25
Grit Collectors	1.25
Scum Breakers	1.25
Slow or Rapid Mixers	1.25
Sludge Collectors	1.25
Thickeners	1.25
Vacuum Filters	1.25
STEERING GEAR	1.0
STOKERS	1.0
WINCH	1.5
WINDLASS	1.75

* Refer to KOP-FLEX

NOTES

- (1) Maximum Torque at the coupling must not exceed Rated Torque of the coupling.
- (2) Check local and industrial safety codes.

1. **Select Coupling Based on Bore Capacity.**
Select the coupling size that has a maximum bore capacity equal to or larger than the larger of the two shafts. For interference fits larger than AGMA standards, consult Kop-Flex.
2. **Verify Coupling Size Based on Load Rating.**
 - a. Select appropriate Service Factor from the Table on page 52.
 - b. Calculate required HP / 100 RPM:

$$\frac{\text{HP} \times \text{Service Factor} \times 100}{\text{RPM}} = \text{HP} / 100 \text{ RPM}$$
 - c. Verify that the selected coupling has a rating greater than or equal to the required HP / 100 RPM.

3. **Check Balance Requirements.**
Consult Dynamic Balancing Guide to help determine if balancing is required. Verify that the maximum operating speed does not exceed the maximum speed rating of the coupling. The maximum speed rating does not consider lateral critical speed considerations for floating shaft applications.

Note: Care must be exercised on proper selection of any shaft coupling. The Users must assure themselves that the design of the shaft to coupling hub connection is adequate for the duty intended.

Dynamic Balancing Guide

Balancing requirements for a coupling are dependent on factors determined by the characteristics of the connected equipment. For this reason, the Balancing Charts should be used as a GUIDE ONLY to assist in determining whether or not balancing is required.

The Balancing Charts shown are based on AGMA 9000-C90 suggested balance classes for systems with "Average" sensitivity to unbalance. For systems with higher sensitivity to unbalance, balancing of the coupling may be required at lower speeds. For systems which are less sensitive to unbalance, couplings may be able to operate at higher speeds than those shown at lower balance levels. Therefore, in the absence of either a thorough system analysis or past user experience with a similar installation, these charts should be used as a GUIDE ONLY.

FAST'S® and Series H gear couplings may be component balanced, or assembly balanced with fitted components (Type FB and Type HB, respectively).

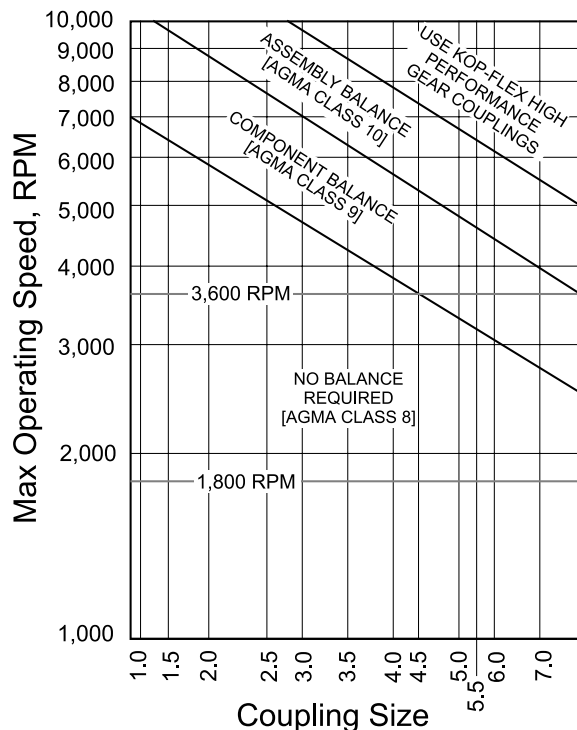
WALDRON® gear couplings are available component balanced only.

Model B gear couplings are not designed to be balanced.

These charts apply to sizes 1 through 7 only. Dynamic balance of size 8 through 30 must be considered on a case-by-case basis. Consult KOP-FLEX for assistance.

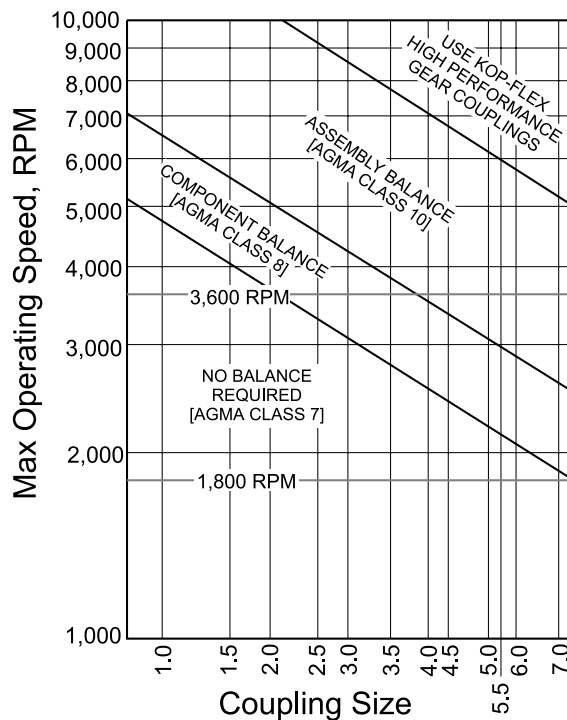
Close Coupled Balancing Chart

Based on AGMA 9000-C90 for Average System Sensitivity



Spacer Coupling Balancing Chart for 12" Shaft Separation

Based on AGMA 9000-C90 for Average System Sensitivity



A conventional 4-bearing system has two bearings on the driving shaft and two bearings on the driven shaft. Both angular and offset shaft misalignment will be present to some degree and a full flex coupling is mandatory. The full flex coupling is the standard coupling having two gear ring sets, one set per half coupling. For selection procedure see page 53.

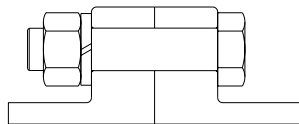
KOP-FLEX Coupling Greases

KOP-FLEX offers greases specifically designed for use in coupling applications. To ensure proper lubrication and long service life, use KOP-FLEX KSG Standard Coupling Grease, or KHP High Performance Coupling Grease. See page 101 for detailed specifications.

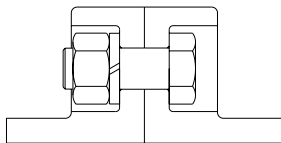


Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions				
							A	B	C	E	O
1 1/2	1 5/8	27	17000	34000	12000	16.5	6	4	1/8	1 15/16	2 3/16
2	2 1/8	50	31500	63000	9300	27.4	7	4 15/16	1/8	2 7/16	2 7/8
2 1/2	2 3/4	90	56700	113400	7900	48.0	8 3/8	6 3/16	3/16	3 1/32	3 5/8
3	3 1/8	160	101000	202000	6800	70.8	9 7/16	7 5/16	3/16	3 19/32	4 1/4
3 1/2	3 3/4	235	148000	296000	6000	113	11	8 1/2	1/4	4 3/16	5
4	4 1/4	375	236000	472000	5260	177	12 1/2	9 3/4	1/4	4 3/4	5 3/4
4 1/2	4 3/4	505	318000	636000	4770	231	13 5/8	10 15/16	5/16	5 5/16	6 1/2
5	5 1/2	700	441000	882000	4300	351	15 5/16	12 1/16	5/16	6 1/32	7 5/16
5 1/2*	5 7/8	920	580000	1160000	3880	435	16 3/4	13 13/16	5/16	6 29/32	8
6*	6 1/2	1205	759000	1518000	3600	538	18	14 13/16	5/16	7 13/32	8 13/16
7*	8	1840	1160000	2320000	3000	860	20 3/4	17 5/16	3/8	8 11/16	10 5/16

* Sizes 5 1/2, 6 and 7 are only available with exposed bolt sleeves. Type EB exposed bolts are standard.



TYPE EB -
EXPOSED BOLTS

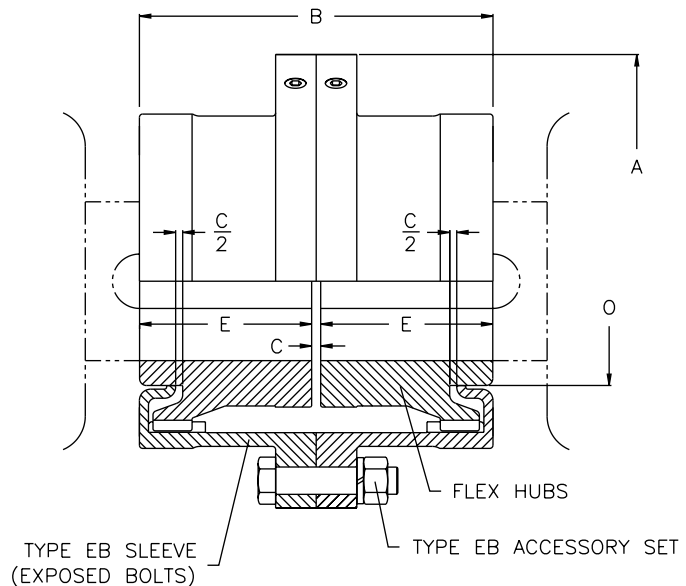


TYPE SB -
SHROUDED BOLTS

Fastener Data

Coupling Size	Type EB Exposed Bolt			Type SB Shrouded Bolt		
	Qty.	Size & Length	Bolt Circle	Qty.	Size & Length	Bolt Circle
1 1/2	8	3/8 x 2	4 13/16	8	3/8 x 1	4 13/16
2	6	1/2 x 2 1/4	5 7/8	10	3/8 x 1	5 13/16
2 1/2	6	5/8 x 2 3/4	7 1/8	10	1/2 x 1 5/16	7
3	8	5/8 x 2 3/4	8 1/8	12	1/2 x 1 5/16	8
3 1/2	8	3/4 x 3 3/8	9 1/2	12	5/8 x 1 5/8	9 9/32
4	8	3/4 x 3 3/8	11	14	5/8 x 1 5/8	10 5/8
4 1/2	10	3/4 x 3 3/8	12	14	5/8 x 1 5/8	11 3/4
5	8	7/8 x 4 1/4	13 1/2	14	3/4 x 2 1/8	13 3/16
5 1/2*	14	7/8 x 3 1/4	14 1/2	-	-	-
6*	14	7/8 x 3 1/4	15 3/4	-	-	-
7*	16	1 x 3 5/8	18 1/4	-	-	-

* Sizes #5 1/2 and larger are available in exposed bolts only.



FAST'S coupling sizes 8-30 feature an all-metal end ring which can be easily removed to inspect the hub and sleeve teeth without removing the hub from its shaft.

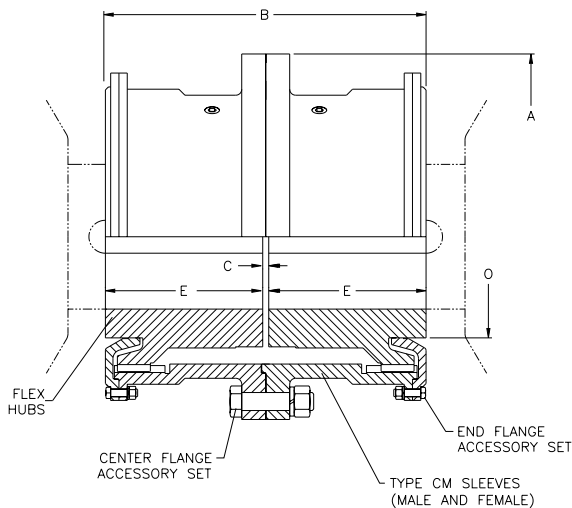
All end rings have gaskets and are bolted to the sleeves. Non-critical surfaces are as-cast, or as-forged. Sleeves have mating male and female rabbets at the center and end flange joints to simplify installation. The sleeves have two lube plugs in the body.

Standardized center flanges allow flex-half substitution regardless of design or vintage. All bolts are special with respect to body length, thread length, and bolt body tolerance.

Sizes 8 - 30 are available with exposed bolts only.



Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in. x 1000)	Peak Torque Rating (lb.-in. x 1000)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions				
							A	B	C	E	O
8	8 3/4	2230	1404	2808	1750	1408	23 1/4	20	3/8	9 13/16	11 7/8
9	9 3/4	3170	1995	3990	1625	1898	26	22 1/4	1/2	10 7/8	13 3/8
10	11	4350	2744	5488	1500	2548	28	24 1/2	1/2	12	15 1/4
11	12	5780	3645	7290	1375	3342	30 1/2	26 3/4	1/2	13 1/8	16 7/8
12	13	7190	4532	9064	1250	4194	33	28 1/4	1/2	13 7/8	18 1/2
13	14 1/4	9030	5688	11376	1125	5112	35 3/4	30	3/4	14 5/8	20
14	15 1/2	11080	6982	13964	1000	6100	38	31 3/4	3/4	15 1/2	21 3/4
15	17	13470	8488	16976	875	7650	40 1/2	33 3/4	3/4	16 1/2	23 1/2
16	18	16100	10150	20300	750	8965	43	35 3/4	1	17 3/8	25
18	20 1/2	21100	13300	26600	500	11770	47 1/4	37	1	18	28 1/4
20	23	28800	18144	36288	400	16910	53 1/2	43 1/4	1	21 1/8	31 7/8
22	26	38100	24009	48018	300	22370	59	47	1	23	35 1/4
24	28	42400	26699	53398	200	28830	64 1/4	50 1/2	1	24 3/4	38 3/4
26	30	53000	33415	66830	200	35890	68 1/2	54	1	26 1/2	42 1/4
28	33	65900	41564	83128	200	42660	73 3/4	56 1/4	1	27 1/8	45 3/4
30	36	80300	50614	101228	200	49780	78	55 1/4	1	27 5/8	49 1/4



Fastener Data

Coupling Size	Center Flange			End Ring		
	Quantity	Size & Length	Bolt Circle	Quantity (each)	Size & Length	Bolt Circle
8	16	1 1/8 x 4 1/8	20 3/4	10	1/2 x 2	19 3/8
9	18	1 1/4 x 4 1/2	23 1/4	12	5/8 x 2 3/16	21 3/4
10	18	1 3/8 x 5 3/8	25 1/4	12	5/8 x 2 3/16	23 7/8
11	18	1 1/2 x 5 7/8	27 1/2	12	5/8 x 2 3/16	26 1/16
12	18	1 1/2 x 6 1/8	30	12	3/4 x 2 9/16	28 5/16
13	18	1 5/8 x 6 3/8	32 1/4	12	3/4 x 2 9/16	30 1/2
14	18	1 3/4 x 6 5/8	34 1/2	14	3/4 x 2 9/16	32 5/8
15	20	1 3/4 x 6 5/8	36 3/4	14	7/8 x 2 7/8	35
16	20	2 x 7 3/8	39	14	7/8 x 2 7/8	37 1/8
18	22	2 x 7 3/8	43 1/4	14	7/8 x 2 7/8	41 3/8
20	22	2 1/4 x 7 5/8	48 3/4	16	1 x 3 5/8	46 1/4
22	22	2 1/2 x 8 1/8	53 1/2	16	1 x 3 5/8	50 3/4
24	22	2 3/4 x 8 7/8	58 1/4	16	1 1/8 x 4 1/8	55
26	24	2 3/4 x 8 7/8	62 1/2	18	1 1/8 x 4 1/8	59 1/4
28	22	3 x 9 5/8	67 1/4	16	1 1/4 x 4 1/4	63 11/16
30	24	3 x 9 5/8	71 1/2	18	1 1/4 x 4 1/4	68 3/16

Coupling Type EB (Exposed Bolts) Part Numbers

Coupling Size	Full Flex Coupling			Fastener Set (Includes Gasket)		Sleeve		Flex Hub		
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.	Finish Bore ^① Part No.
1 1/2	1 1/2F EB FF	19	1 1/2F EB FF FB	1 1/2 EB FS	1	1 1/2F EB SLEEVE	6	1 1/2F FHUB	3	1 1/2F FHUB FB
2	2F EB FF	30	2F EB FF FB	2 EB FS	1	2F EB SLEEVE	8	2F FHUB	7	2F FHUB FB
2 1/2	2 1/2F EB FF	52	2 1/2F EB FF FB	2 1/2 EB FS	2	2 1/2F EB SLEEVE	14	2 1/2F FHUB	12	2 1/2F FHUB FB
3	3F EB FF	76	3F EB FF FB	3 EB FS	3	3F EB SLEEVE	17	3F FHUB	20	3F FHUB FB
3 1/2	3 1/2F EB FF	117	3 1/2F EB FF FB	3 1/2 EB FS	5	3 1/2F EB SLEEVE	28	3 1/2F FHUB	28	3 1/2F FHUB FB
4	4F EB FF	180	4F EB FF FB	4 EB FS	5	4F EB SLEEVE	41	4F FHUB	47	4F FHUB FB
4 1/2	4 1/2F EB FF	244	4 1/2F EB FF FB	4 1/2 EB FS	7	4 1/2F EB SLEEVE	53	4 1/2F FHUB	66	4 1/2F FHUB FB
5	5F EB FF	361	5F EB FF FB	5 EB FS	9	5F EB SLEEVE	80	5F FHUB	96	5F FHUB FB
5 1/2	5 1/2F EB FF	422	5 1/2F EB FF FB	5 1/2 EB FS	14	5 1/2F EB SLEEVE	89	5 1/2F FHUB	115	5 1/2F FHUB
6	6F EB FF	494	6F EB FF FB	6 EB FS	14	6F EB SLEEVE	100	6F FHUB	140	6F FHUB
7	7F EB FF	822	7F EB FF FB	7 EB FS	22	7F EB SLEEVE	160	7F FHUB	240	7F FHUB

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Coupling Type SB (Shrouded Bolts) Part Numbers

Coupling Size	Full Flex Coupling			Fastener Set (Includes Gasket)		Sleeve		Flex Hub		
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.	Finish Bore ^① Part No.
1 1/2	1 1/2F SB FF	19	1 1/2F SB FF FB	1 1/2 SB FS	1	1 1/2F SB SLEEVE	6	1 1/2F FHUB	3	1 1/2F FHUB FB
2	2F SB FF	30	2F SB FF FB	2 SB FS	1	2F SB SLEEVE	8	2F FHUB	7	2F FHUB FB
2 1/2	2 1/2F SB FF	52	2 1/2F SB FF FB	2 1/2 SB FS	2	2 1/2F SB SLEEVE	13	2 1/2F FHUB	12	2 1/2F FHUB FB
3	3F SB FF	76	3F SB FF FB	3 SB FS	2	3F SB SLEEVE	15	3F FHUB	20	3F FHUB FB
3 1/2	3 1/2F SB FF	117	3 1/2F SB FF FB	3 1/2 SB FS	4	3 1/2F SB SLEEVE	26	3 1/2F FHUB	28	3 1/2F FHUB FB
4	4F SB FF	180	4F SB FF FB	4 SB FS	4	4F SB SLEEVE	37	4F FHUB	47	4F FHUB FB
4 1/2	4 1/2F SB FF	244	4 1/2F SB FF FB	4 1/2 SB FS	4	4 1/2F SB SLEEVE	50	4 1/2F FHUB	66	4 1/2F FHUB FB
5	5F SB FF	361	5F SB FF FB	5 SB FS	7	5F SB SLEEVE	72	5F FHUB	96	5F FHUB FB

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Coupling Type (Exposed Bolts) Part Numbers

Coupling Size	Full Flex	Male Half w/Access	Female Half w/Access	Hub	Male Sleeve	Female Sleeve	End Ring	Center Flange Fastener Set (includes gasket)	End Ring Fastener Set (includes gasket)
8	8F EB FF	8F EB MH	8F EB FH	8F FHUB	8F EB MSLEEVE	8F EB FSLEEVE	8F ERING	8 EB FS	8 ERFS
9	9F EB FF	9F EB MH	9F EB FH	9F FHUB	9F EB MSLEEVE	9F EB FSLEEVE	9F ERING	9 EB FS	9 ERFS
10	10F EB FF	10F EB MH	10F EB FH	10F FHUB	10F EB MSLEEVE	10F EB FSLEEVE	10F ERING	10 EB FS	10 ERFS
11	11F EB FF	11F EB MH	11F EB FH	11F FHUB	11F EB MSLEEVE	11F EB FSLEEVE	11F ERING	11 EB FS	11 ERFS
12	12F EB FF	12F EB MH	12F EB FH	12F FHUB	12F EB MSLEEVE	12F EB FSLEEVE	12F ERING	12 EB FS	12 ERFS
13	13F EB FF	13F EB MH	13F EB FH	13F FHUB	13F EB MSLEEVE	13F EB FSLEEVE	13F ERING	13 EB FS	13 ERFS
14	14F EB FF	14F EB MH	14F EB FH	14F FHUB	14F EB MSLEEVE	14F EB FSLEEVE	14F ERING	14 EB FS	14 ERFS
15	15F EB FF	15F EB MH	15F EB FH	15F FHUB	15F EB MSLEEVE	15F EB FSLEEVE	15F ERING	15 EB FS	15 ERFS
16	16F EB FF	16F EB MH	16F EB FH	16F FHUB	16F EB MSLEEVE	16F EB FSLEEVE	16F ERING	16 EB FS	16 ERFS
18	18F EB FF	18F EB MH	18F EB FH	18F FHUB	18F EB MSLEEVE	18F EB FSLEEVE	18F ERING	18 EB FS	18 ERFS
20	20F EB FF	20F EB MH	20F EB FH	20F FHUB	20F EB MSLEEVE	20F EB FSLEEVE	20F ERING	20 EB FS	20 ERFS
22	22F EB FF	22F EB MH	22F EB FH	22F FHUB	22F EB MSLEEVE	22F EB FSLEEVE	22F ERING	22 EB FS	22 ERFS
24	24F EB FF	24F EB MH	24F EB FH	24F FHUB	24F EB MSLEEVE	24F EB FSLEEVE	24F ERING	24 EB FS	24 ERFS
26	26F EB FF	26F EB MH	26F EB FH	26F FHUB	26F EB MSLEEVE	26F EB FSLEEVE	26F ERING	26 EB FS	26 ERFS
28	28F EB FF	28F EB MH	28F EB FH	28F FHUB	28F EB MSLEEVE	28F EB FSLEEVE	28F ERING	28 EB FS	28 ERFS
30	30F EB FF	30F EB MH	30F EB FH	30F FHUB	30F EB MSLEEVE	30F EB FSLEEVE	30F ERING	30 EB FS	30 ERFS

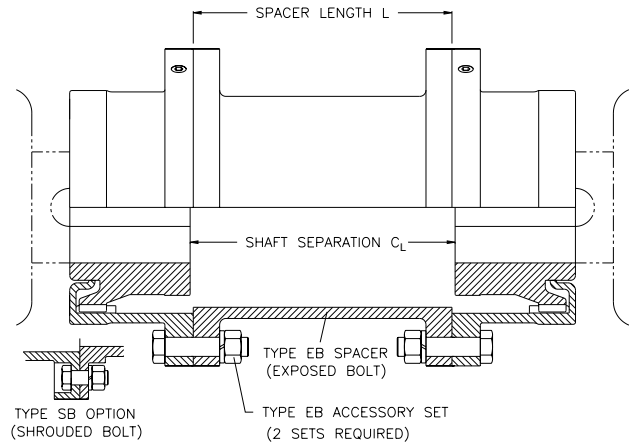
Standard Spacer Couplings

Full-flex spacer couplings are used for 4 bearing installations with extended shaft separations. Tabulated here are spacers for industry standard shaft separations, C_L .

Type EB exposed bolt spacers and Type SB shrouded bolt spacers for standard shaft separations are normally in stock. **Other lengths are manufactured to order.**

Spacer length, L , is calculated by subtracting the standard full-flex, close coupled gap, C , from the shaft separation, C_L .

$$L = C_L - C \quad (\text{full-flex, close coupled})$$



Spacer Part Numbers

Stock Spacer Part Numbers
Type SB (Shrouded Bolts)

Coupling Size	Shaft Separation							
	3 1/2"		4 3/8"		5"		7"	
	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.
1 1/2	1 1/2 SB SPR350	6	1 1/2 SB SPR438	7	1 1/2 SB SPR500	8		
2	2 SB SPR350	8	2 SB SPR438	9	2 SB SPR500	10	2 SB SPR700	12
2 1/2					2 1/2 SB SPR500	14	2 1/2 SB SPR700	17
3					3 SB SPR500	17	3 SB SPR700	20
3 1/2					3 1/2 SB SPR500	27		

Stock Spacer Part Numbers
Type EB (Exposed Bolts)

Coupling Size	Shaft Separation			
	5"		7"	
	Part No.	Wt.	Part No.	Wt.
1 1/2	1 1/2 EB SPR500	8		
2	2 EB SPR500	10	2 EB SPR700	12
2 1/2	2 1/2 EB SPR500	14		
3	3 EB SPR500	17		

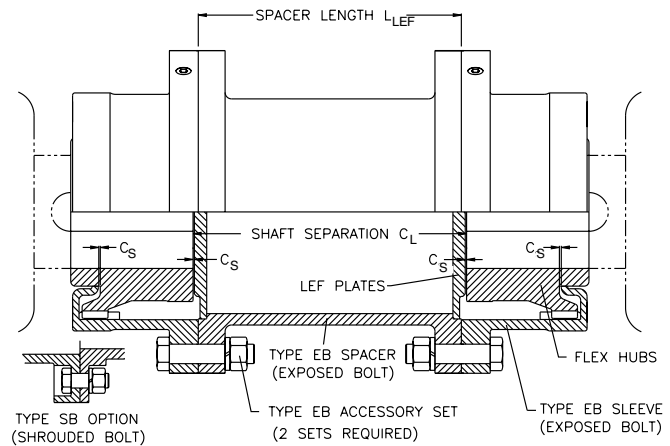
LEF Spacer Couplings

Limited End Float (LEF) spacer couplings are used for sleeve bearing motor applications with extended shaft separations. LEF spacers are supplied with steel LEF plates installed in each end.

Spacer length, L_{LEF} , is calculated by subtracting the LEF full-flex, close coupled gap, C_{LEF} , from the shaft separation, C_L .

$$L_{LEF} = C_L - C_{LEF} \quad (\text{full-flex, close coupled})$$

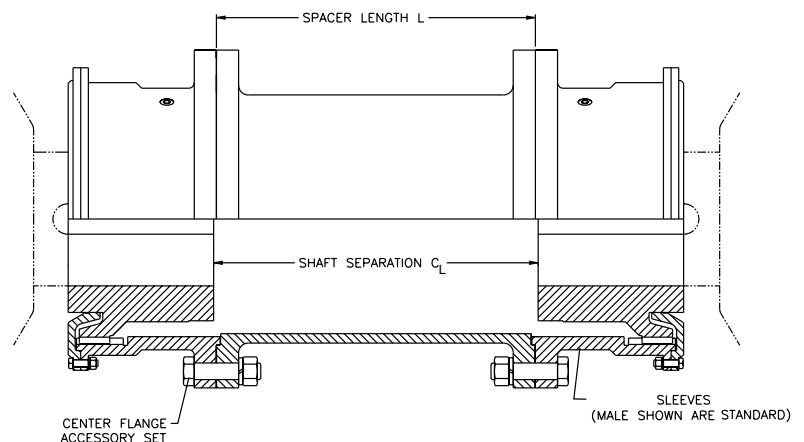
LEF spacers are shorter than standard spacers for a given shaft separation, and are manufactured to order.



Couplings sizes 8 - 30 are also available as spacer couplings for extended shaft separations. These sizes are available in exposed bolt only.

Spacers for coupling sizes 4 - 30 are non-stock and are manufactured to order. LEF spacer couplings are also manufactured to order.

Spacer Couplings Size 8-30

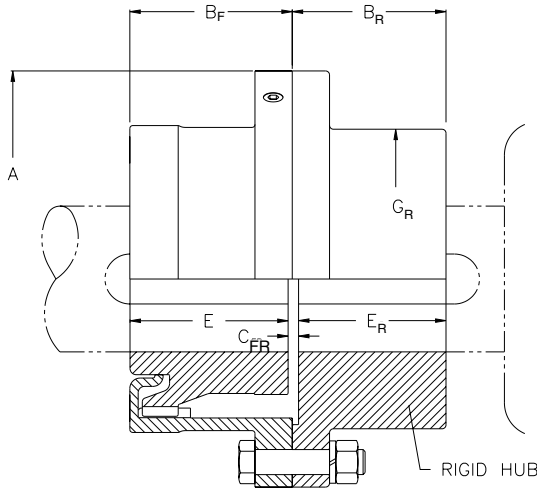


KOP-FLEX Coupling Greases

KOP-FLEX offers greases specifically designed for use in coupling applications. To ensure proper lubrication and long service life, use KOP-FLEX KSG Standard Coupling Grease, or KHP High Performance Coupling Grease. See page 101 for detailed specifications.

Flex Rigid and Floating Shaft Couplings Size 1 1/2 - 7

When driving and driven shafts are widely separated, an unsupported or floating shaft is used to span the gap. The two couplings required at each end of that shaft consist of one half of a standard coupling bolted to a Rigid Hub, each unit called a Flex-Rigid Coupling. Usually, the rigid hubs are mounted on the driving and driven shafts so that the flex halves on the floating shaft may be replaced without disturbing the connected equipment.



Coupling Type EB (Exposed Bolts) Part Numbers

Coupling Size	Flex Rigid Coupling			Rigid Hub②		
	No Bore Part No.	Wt.	Finish Bore① Part No.	No Bore Part No.	Wt.	Finish Bore① Part No.
1 1/2	1 1/2F EB FR	19	1 1/2F EB FR FB	1 1/2 EB RHUB	9	1 1/2 EB RHUB FB
2	2F EB FR	31	2F EB FR FB	2EB RHUB	15	2EB RHUB FB
2 1/2	2 1/2F EB FR	55	2 1/2F EB FR FB	2 1/2EB RHUB	27	2 1/2EB RHUB FB
3	3F EB FR	83	3F EB FR FB	3SEB RHUB	40	3EB RHUB FB
3 1/2	3 1/2F EB FR	126	3 1/2F EB FR FB	3 1/2EB RHUB	65	3 1/2EB RHUB FB
4	4F EB FR	184	4F EB FR FB	4EB RHUB	90	4EB RHUB FB
4 1/2	4 1/2F EB FR	252	4 1/2F EB FR FB	4 1/2EB RHUB	124	4 1/2EB RHUB FB
5	5F EB FR	371	5F EB FR FB	5EB RHUB	119	5EB RHUB FB
5 1/2	5 1/2F EB FR	418	5 1/2F EB FR FB	5 1/2EB RHUB	200	5 1/2EB RHUB FB
6	6F EB FR	504	6F EB FR FB	6EB RHUB	250	6EB RHUB FB
7	7F EB FR	792	7F EB FR FB	7EB RHUB	370	7EB RHUB FB

Coupling Type SB (Shrouded Bolts) Part Numbers

Coupling Size	Flex Rigid Coupling			Rigid Hub②		
	No Bore Part No.	Wt.	Finish Bore① Part No.	No Bore Part No.	Wt.	Finish Bore① Part No.
1 1/2	1 1/2F SB FR	19	1 1/2F SB FR FB	1 1/2 SB RHUB	9	1 1/2 SB RHUB FB
2	2F SB FR	31	2F SB FR FB	2SB RHUB	15	2SB RHUB FB
2 1/2	2 1/2F SB FR	55	2 1/2F SB FR FB	2 1/2SB RHUB	27	2 1/2SB RHUB FB
3	3F SB FR	83	3F SB FR FB	3SB RHUB	40	3SB RHUB FB
3 1/2	3 1/2F SB FR	126	3 1/2F SB FR FB	3 1/2SB RHUB	65	3 1/2SB RHUB FB
4	4F SB FR	184	4F SB FR FB	4SB RHUB	90	4SB RHUB FB
4 1/2	4 1/2F SB FR	252	4 1/2F SB FR FB	4 1/2SB RHUB	124	4 1/2SB RHUB FB
5	5F SB FR	371	5F SB FR FB	5SB RHUB	119	5SB RHUB FB

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances.

② Rigid hubs are furnished less fasteners.

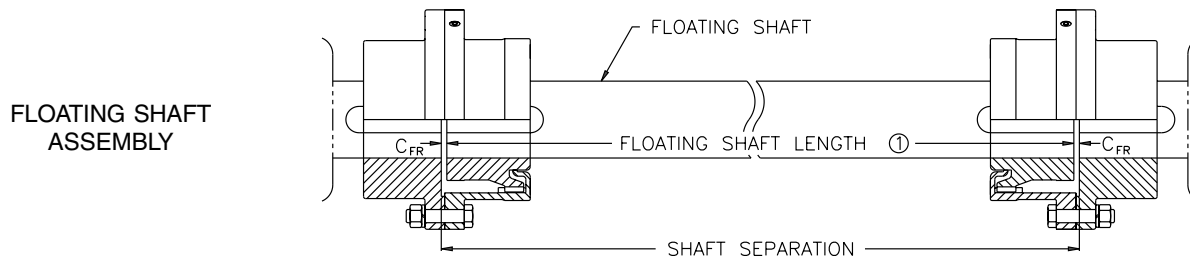
Flex-Rigid Coupling Data

Coupling Size	Maximum Bore with Standard Keyway		Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM) ②	Dimensions						
	Flex	Rigid					A	B _F	B _R	C _{FR} ①	E	E _R	G _R
1 1/2	1 5/8	2 11/16	27	17000	34000	12000	6	2	1 15/16	5/32	1 15/16	1 27/32	3 13/16
2	2 1/8	3 3/8	50	31500	63000	9300	7	2 15/32	2 3/8	5/32	2 7/16	2 9/32	4 13/16
2 1/2	2 3/4	4	90	56700	113400	7900	8 3/8	3 9/32	3	3/16	3 1/32	2 29/32	5 3/4
3	3 1/8	4 3/4	160	101000	202000	6800	9 7/16	3 21/32	3 9/16	3/16	3 19/32	3 15/32	6 3/4
3 1/2	3 3/4	5 1/2	235	148000	296000	6000	11	4 1/4	4 1/8	7/32	4 3/16	4 1/32	7 3/4
4	4 1/4	6 3/8	375	236000	472000	5260	12 1/2	4 7/8	4 5/8	5/16	4 3/4	4 7/16	9
4 1/2	4 3/4	7 1/4	505	318000	636000	4770	13 5/8	5 15/32	5 1/4	11/32	5 5/16	5 1/16	10 1/8
5	5 1/2	8 1/2	700	441000	882000	4300	15 5/16	6 1/32	5 7/8	11/32	6 1/32	5 11/16	11 3/8
5 1/2*	5 7/8	8	920	580000	1160000	3880	16 3/4	6 29/32	7 5/32	11/32	6 29/32	6 31/32	10 3/4
6*	6 1/2	8 3/4	1205	759000	1518000	3600	18	7 13/32	7 21/32	11/32	7 13/32	7 15/32	11 1/2
7*	8	10	1840	1160000	2320000	3000	20 3/4	8 21/32	9	7/16	8 11/16	8 3/4	13 3/8

* Sizes 5 1/2, 6 and 7 are only available with exposed bolts. Type EB exposed bolts are standard.

① Floating shaft length is equal to the shaft separation minus 2 times the C_FR dimension.

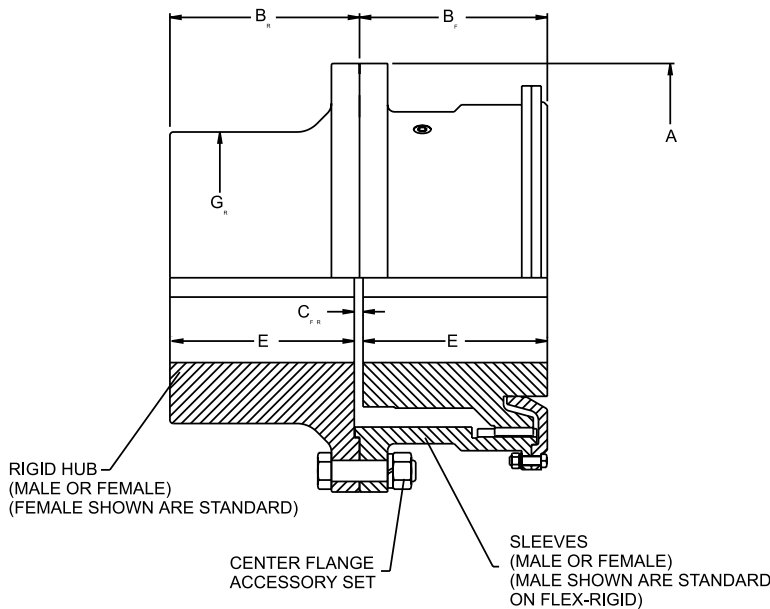
② Max. speed is based on flange stress limits and does not consider lateral critical speed considerations for floating shaft applications.



Ordering Instructions: When ordering floating shaft couplings, be sure to include hp and rpm, shaft separation, and equipment shaft sizes. Applications with very large shaft separations and/or high speeds may require tubular floating shafts due to lateral critical speed concerns.

Important: Care must be exercised in proper selection of any shaft coupling. The Users must assure themselves that the design of the shaft to coupling hub connection is adequate for the duty intended.

Flex Rigid and Floating Shaft Couplings Size 8 - 30



**Coupling Type EB
(Exposed Bolts) Part Numbers**

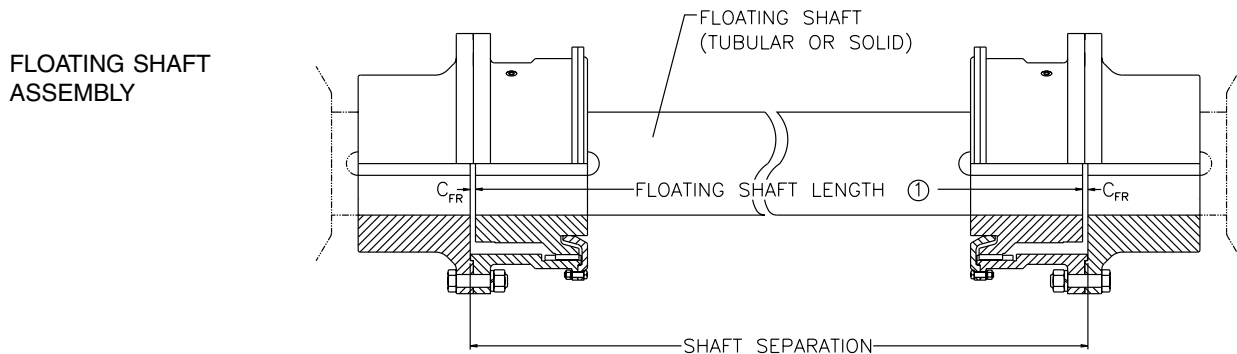
Coupling Size	Flex Rigid w/Access	Male Rigid	Female Rigid
8	8F EB FR	8F EB MRHUB	8F EB FRHUB
9	9F EB FR	9F EB MRHUB	9F EB FRHUB
10	10F EB FR	10F EB MRHUB	10F EB FRHUB
11	11F EB FR	11F EB MRHUB	11F EB FRHUB
12	12F EB FR	12F EB MRHUB	12F EB FRHUB
13	13F EB FR	13F EB MRHUB	13F EB FRHUB
14	14F EB FR	14F EB MRHUB	14F EB FRHUB
15	15F EB FR	15F EB MRHUB	15F EB FRHUB
16	16F EB FR	16F EB MRHUB	16F EB FRHUB
18	18F EB FR	18F EB MRHUB	18F EB FRHUB
20	20F EB FR	20F EB MRHUB	20F EB FRHUB
22	22F EB FR	22F EB MRHUB	22F EB FRHUB
24	24F EB FR	24F EB MRHUB	24F EB FRHUB
26	26F EB FR	26F EB MRHUB	26F EB FRHUB
28	28F EB FR	28F EB MRHUB	28F EB FRHUB
30	30F EB FR	30F EB MRHUB	30F EB FRHUB

Coupling Size	Maximum Bore with Standard Key		Rating HP / 100 RPM	Torque Rating (lb.-in. x 1000)	Peak Torque Rating (lb.-in. x 1000)	Maximum Speed (RPM) ②	Weight with Solid Hubs (lb.)	Dimensions					
	Flex	Rigid						A	B _F	B _R	C _{FR} ①	E	G _R
8	8 3/4	11	2230	1404	2808	1750	1306	23 1/4	10	10 1/8	1/2	9 13/16	15 1/4
9	9 3/4	12 3/4	3170	1995	3990	1625	1795	26	11 1/8	11 3/16	9/16	10 7/8	17 1/4
10	11	13 1/2	4350	2744	5488	1500	2404	28	12 1/4	12 3/8	5/8	12	19
11	12	15	5780	3645	7290	1375	3151	30 1/2	13 3/8	13 1/2	5/8	13 1/8	20 3/4
12	13	16 1/4	7190	4532	9064	1250	3947	33	14 1/8	14 1/4	5/8	13 7/8	22 5/8
13	14 1/4	18	9030	5688	11376	1125	4866	35 3/4	15	15	3/4	14 5/8	24 5/8
14	15 1/2	19	11080	6982	13964	1000	5800	38	15 7/8	15 7/8	3/4	15 1/2	26 1/4
15	17	20 1/2	13470	8488	16976	875	7155	40 1/2	16 7/8	16 7/8	3/4	16 1/2	28
16	18	22	16100	10150	20300	750	8430	43	17 7/8	17 7/8	1	17 3/8	29 3/4
18	20 1/2	25	21100	13300	26600	500	11130	47 1/4	18 1/2	18 1/2	1	18	34
20	23	26	28800	18144	36288	400	15625	53 1/2	21 5/8	21 5/8	1	21 1/8	36
22	26	27	38100	24009	48018	300	20065	59	23 1/2	23 5/8	1 1/8	23	38
24	28	28	42400	26699	53398	200	25450	64 1/4	25 1/4	25 3/8	1 1/8	24 3/4	40
26	30	29	53000	33415	66830	200	31100	68 1/2	27	27 1/8	1 1/8	26 1/2	42
28	33	30	65900	41564	83128	200	36550	73 3/4	27 5/8	27 3/4	1 1/8	27 1/8	44
30	36	36	80300	50614	101228	200	43780	78	28 1/8	28 1/4	1 1/8	27 5/8	50

NOTE: Couplings are only available with exposed bolts.

① Floating shaft length is equal to the shaft separation, minus 2 times the C_{FR} dimension.

② Max. speed is based on flange stress limits and does not consider lateral critical speed considerations for floating shaft applications.

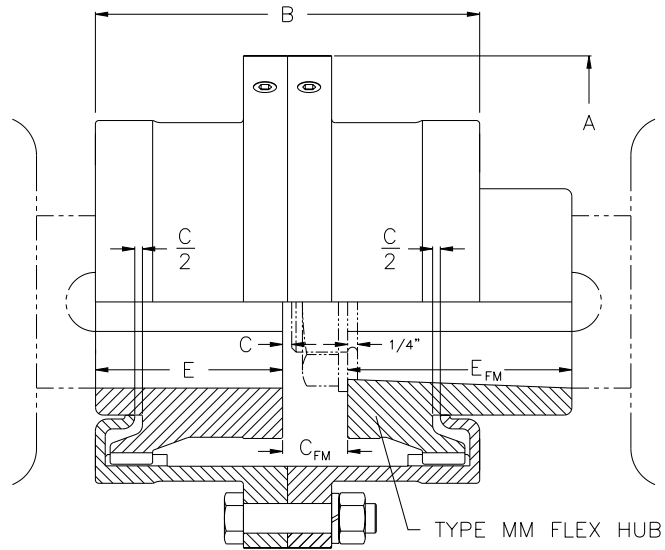


Ordering Instructions: When ordering floating shaft couplings, be sure to include hp and rpm, shaft separation, and equipment shaft sizes. Applications with very large shaft separations and/or high speeds may require tubular floating shafts due to lateral critical speed concerns.

Important: Care must be exercised in proper selection of any shaft coupling. The Users must assure themselves that the design of the shaft to coupling hub connection is adequate for the duty intended.

The FAST'S Mill Motor Coupling is designed for use on AISE and other mill motors having tapered shafts with locknuts, and are used primarily in the metals industry. This design is also commonly used on other types of equipment which use tapered shafts with locknuts, such as turbines, pumps, and compressors.

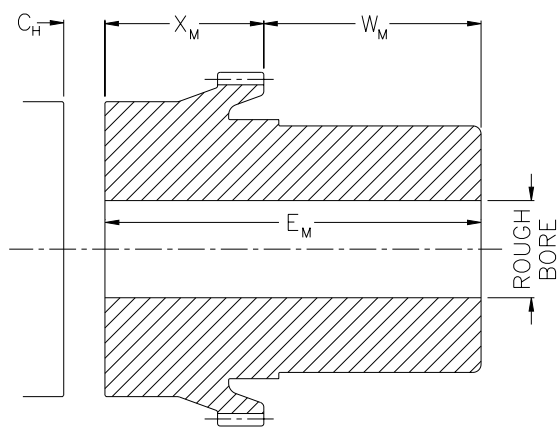
The standard "composite" mill motor hub is a semi-finished hub which can be modified and bored to fit a variety of AISE mill motor frames. Note that one size of coupling will fit several motor frames; conversely, several sizes may fit a single motor frame. See page 53 for proper coupling selection.



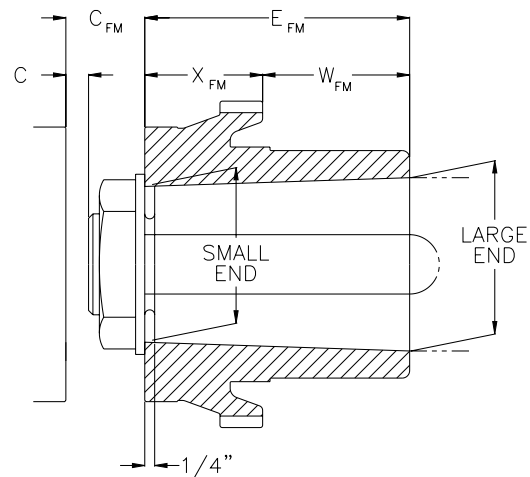
Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions		
							A	B	E
1 1/2	1 5/8	27	17000	34000	12000	18.4	6	4	1 15/16
2	2 1/8	50	31500	63000	9300	30.5	7	4 15/16	2 7/16
2 1/2	2 3/4	90	56700	113400	7900	53.0	8 3/8	6 3/16	3 1/32
3	3 1/8	160	101000	202000	6800	76.8	9 7/16	7 5/16	3 19/32
3 1/2	3 3/4	235	148000	296000	6000	123	11	8 1/2	4 3/16
4	4 1/4	375	236000	472000	5260	184	12 1/2	9 3/4	4 3/4
4 1/2	4 3/4	505	318000	636000	4770	242	13 5/8	10 15/16	5 5/16
5	5 1/2	700	441000	882000	4300	365	15 5/16	12 1/16	6 1/32
5 1/2*	5 7/8	920	580000	1160000	3880	434	16 3/4	13 13/16	6 29/32
6*	6 1/2	1205	759000	1518000	3600	562	18	14 13/16	7 13/32
7*	8	1840	1160000	2320000	3000	862	20 3/4	17 5/16	8 11/16

See next page for additional dimensions.

* Sizes 5 1/2, 6 and 7 are only available with exposed bolts. Type EB exposed bolts are standard.



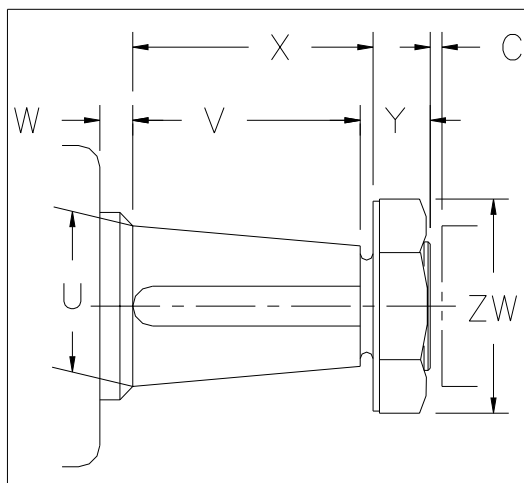
MILL MOTOR COMPOSITE HUB
ROUGH BORED



MILL MOTOR COMPOSITE HUB
FINISH BORED

Type MM Coupling Size	For: AISE Mill Motor Frame Sizes	Rough Bored Composite Hub Dimensions & Part Numbers					Finish Bored Composite Hub For AISE Mill Motors Dimensions & Part Numbers									
		Dimensions				Part Number	Dimensions					Bore Dia.		Keyway	Part Number	
		C _H	E _M	X _M	W _M		C	C _{FM}	E _{FM}	X _{FM}	W _{FM}	Large End	Small End			
1 1/2 2 2 1/2 3	802 602 AC1 AC2 AC4	9/16 3/4 13/16 1 1/16	3 9/16 4 7/16 4 9/16 5 1/8	1 5/16 1 9/16 2 3/32 2 13/32	2 1/4 2 7/8 2 15/32 2 23/32	1 1/2F MMHUB 2F MMHUB 2 1/2F MMHUB 3F MMHUB	1/8 1/8 3/16 3/16	1 1/16 1 1/16 1 1/8 1 1/8	3	13/16 1 1/4 1 25/32 2 11/32	2 3/16 1 3/4 1 7/32 21/32	1.749 1.437	1/2 X 1/8 1/2 X 1/4	1 1/2F MMHUB02 2F MMHUB02 2 1/2F MMHUB02 3F MMHUB02		
2 2 1/2 3 3 1/2	803 804 603 604	3/4 13/16 1 1/16 1 1/8	4 7/16 4 9/16 5 1/8 5 3/4	1 9/16 2 3/32 2 13/32 2 15/16	2 7/8 2 15/32 2 23/32 2 13/16	2F MMHUB 2 1/2F MMHUB 3F MMHUB 3 1/2F MMHUB	1/8 3/16 3/16 1/4	1 1/8 1 3/16 1 3/16 1 1/4		3 1/2	1 3/16 1 23/32 2 9/32 2 13/16			2 5/16 1 25/32 1 7/32 11/16	1.999 1.634	1/2 X 1/4
2 1/2 3 3 1/2 4	806 606 AC8 AC12	13/16 1 1/16 1 1/8 1 1/8	4 9/16 5 1/8 5 3/4 6 3/8	2 3/32 2 13/32 2 15/16 3 1/2	2 15/32 2 23/32 2 13/16 2 7/8	2 1/2F MMHUB 3F MMHUB 3 1/2F MMHUB 4F MMHUB	3/16 3/16 1/4 1/4	1 5/16 1 5/16 1 3/8 1 3/8	4		1 19/32 2 5/32 2 11/16 3 1/4	2 13/32 1 27/32 1 5/16 3/4	2.499 2.082	1/2 X 1/4		
3 3 1/2 4	806 608	1 1/16 1 1/8 1 1/8	5 1/8 5 3/4 6 3/8	2 13/32 2 15/16 3 1/2	2 23/32 2 13/16 2 7/8	3F MMHUB 3 1/2F MMHUB 4F MMHUB	3/16 1/4 1/4	1 7/16 1 1/2 1 1/2		4 1/2	2 1/32 2 9/16 3 1/8	2 15/32 1 15/16 1 3/8			2.999 2.530	3/4 X 1/4
3 3 1/2 4 4 1/2	810 610 AC18	1 1/16 1 1/8 1 1/8 1 5/8	5 1/8 5 3/4 6 3/8 6 7/16	2 13/32 2 15/16 3 1/2 3 19/32	2 23/32 2 13/16 2 7/8 2 27/32	3F MMHUB 3 1/2F MMHUB 4F MMHUB 4 1/2F MMHUB	3/16 1/4 1/4 5/16	1 9/16 1 5/8 1 5/8 1 11/16	4 1/2		1 29/32 2 7/16 3 3 17/32	2 19/32 2 1/16 1 1/2 31/32	3.249 2.780	3/4 X 1/4		
3 1/2 4 4 1/2 5	812 612 AC25 AC30	1 1/8 1 1/8 1 5/8 1 5/8	5 3/4 6 3/8 6 7/16 6	2 15/16 3 1/2 3 19/32 4 5/32	2 13/16 2 7/8 2 27/32 1 27/32	3 1/2F MMHUB 4F MMHUB 4 1/2F MMHUB 5F MMHUB	1/4 1/4 5/16 5/16	1 3/4 1 3/4 1 13/16 1 13/16		5	2 5/16 2 7/8 3 13/32 3 31/32	2 11/16 2 1/8 1 19/32 1 1/32			3.623 3.102	3/4 X 1/4
4 4 1/2 5	814 614 AC40 AC50	1 1/8 1 5/8 1 5/8	6 3/8 6 7/16 6	3 1/2 3 19/32 4 5/32	2 7/8 2 27/32 1 27/32	4F MMHUB 4 1/2F MMHUB 5F MMHUB	1/4 5/16 5/16	1 7/8 1 15/16 1 15/16	5		2 3/4 3 9/32 3 27/32	2 1/4 1 23/32 1 5/32	4.248 3.727	1 X 3/8		
4 1/2 5 5 1/2	816 616	1 5/8 1 5/8 1 5/8	6 7/16 6 8 5/16	3 19/32 4 5/32 4 23/32	2 27/32 1 27/32 3 19/32	4 1/2F MMHUB 5F MMHUB 5 1/2F MMHUB	5/16 5/16 5/16	2 1/16 2 1/16 2 1/16		5 1/2	4 5/32 3 23/32 3 5/8	2 11/32 1 25/32 1 7/32			4.623 4.050	1 1/4 X 3/8
4 1/2 5 5 1/2	818 618	1 5/8 1 5/8 1 5/8	6 7/16 6 8 5/16	3 19/32 4 5/32 4 23/32	2 27/32 1 27/32 3 19/32	4 1/2F MMHUB 5F MMHUB 5 1/2F MMHUB	5/16 5/16 5/16	1 5/8 1 5/8 1 5/8	6		3 19/32 4 5/32 4 23/32	2 13/32 1 27/32 1 9/32	4.998 4.373	1 1/4 X 1/2		
5 1/2 6	620	1 5/8 2 1/16	8 5/16 9 7/8	4 23/32 4 27/32	3 19/32 5 1/32	5 1/2F MMHUB 6F MMHUB	5/16 5/16	2 1/16 2 1/16		6 3/4	4 9/32 4 27/32	2 15/32 1 29/32			5.873 5.170	1 1/2 X 3/4
6 7	622	2 1/16 2 3/4	9 7/8 9 1/4	4 27/32 5 5/16	5 1/32 3 15/16	6F MMHUB 7F MMHUB	5/16 3/8	2 11/16 2 3/4	7 1/4		4 7/32 5 5/16	3 1/32 1 15/16	6.247 5.492	1 1/2 X 3/4		
6 7	624	2 1/16 2 3/4	9 7/8 9 1/4	4 27/32 5 5/16	5 1/32 3 15/16	6F MMHUB 7F MMHUB	5/16 3/8	2 11/16 2 3/4		9 1/4	4 7/32 5 5/16	5 1/32 3 15/16			6.997 6.034	1 1/2 X 1/2 1 1/2 X 3/4

*ALL KEYWAYS SHOWN ARE PARALLEL TO THE TAPER. TAPER IS 1/4 INCH PER FOOT ON DIAMETER.



IV. TAPERED BORES For Tapered Shafts, with or without locknut.

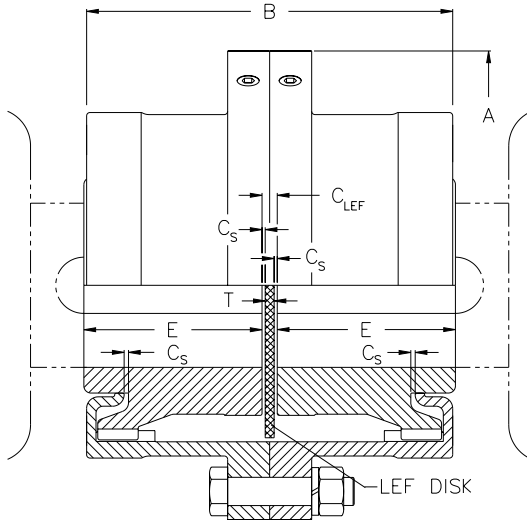
Determine applicable AISE Mill Motor frame or provide data below:

1. U Major diameter.
2. V Length of tapered portion of shaft.
3. X Length to face of lockwasher.
4. Y Length of threaded projection.
5. ZW Locknut diameter across corners.
6. W Clearance to bearing housing.
7. Taper (inches on diameter per foot of length).
8. Keyway width and depth.
9. Whether keyway is parallel to shaft or to taper.
10. C Shaft separation if machines are in place.

Limited End Float Coupling Size 1 1/2 - 7

For sleeve bearing motor applications, a FAST'S standard full flex coupling is supplied with an LEF disc to limit the axial float of the motor rotor, and protect the motor bearings at start-up and shut-down. The hub separation, C_{LEF} is larger than for a standard full flex, and the phenolic LEF disc is placed between the hubs at assembly, limiting the float of the motor rotor to the total LEF value shown.

The equipment should be installed with the proper hub separation, C_{LEF} , when the motor rotor is located on magnetic center. The LEF disc part numbers are listed below. See page 56 for the standard full flex part numbers.



Coupling Size	Total LEF	Dimensions						LEF Disc①	
		A	B	C _S	C _{LEF} (Hub Sep.)	E	T (Disc Width)	Part No.	Wt.
1 1/2	1/8	6	4	1/32	3/16	1 15/16	1/8	1 1/2F LEFD	1
2	1/8	7	4 15/16	1/32	3/16	2 7/16	1/8	2F LEFD	1
2 1/2	3/16	8 3/8	6 3/16	3/64	9/32	3 1/32	3/16	2 1/2F LEFD	1
3	3/16	9 7/16	7 5/16	3/64	9/32	3 19/32	3/16	3F LEFD	1
3 1/2	3/16	11	8 1/2	3/64	13/32	4 3/16	5/16	3 1/2F LEFD	1
4	3/16	12 1/2	9 3/4	3/64	13/32	4 3/4	5/16	4F LEFD	2
4 1/2	3/16	13 5/8	10 15/16	3/64	17/32	5 5/16	7/16	4 1/2F LEFD	2
5	3/16	15 5/16	12 1/16	3/64	17/32	6 1/32	7/16	5F LEFD	2
5 1/2*	3/16	16 3/4	13 13/16	3/64	17/32	6 29/32	7/16	5 1/2F LEFD	2
6*	3/16	18	14 13/16	3/64	17/32	7 13/32	7/16	6F LEFD	2
7*	3/16	20 3/4	17 5/16	3/64	21/32	8 11/16	9/16	7F LEFD	2

* Sizes 5 1/2, 6 and 7 are only available with exposed bolts. Type EB exposed bolts are standard.

① LEF Discs are used only in close coupled applications. One disc is required per coupling. Note: For ratings and max. bores refer to page 54.

KOP-FLEX Coupling Greases

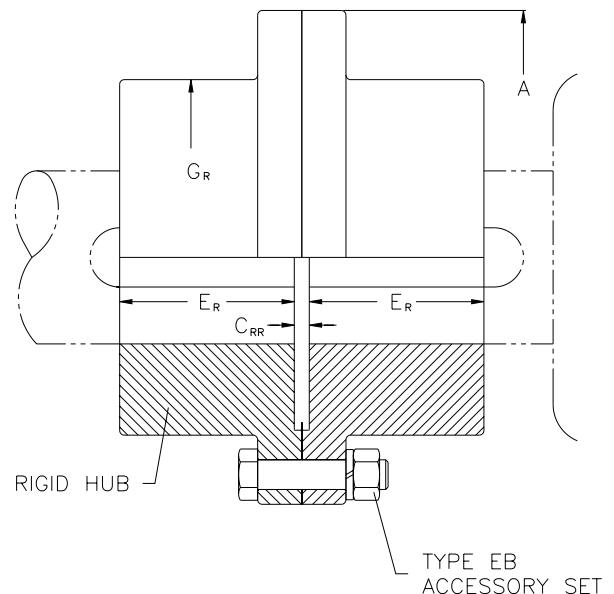
KOP-FLEX offers greases specifically designed for use in coupling applications. To ensure proper lubrication and long service life, use KOP-FLEX KSG Standard Coupling Grease, or KHP High Performance Coupling Grease. See page 101 for detailed specifications.

Rigid-Rigid Coupling Size 1-7

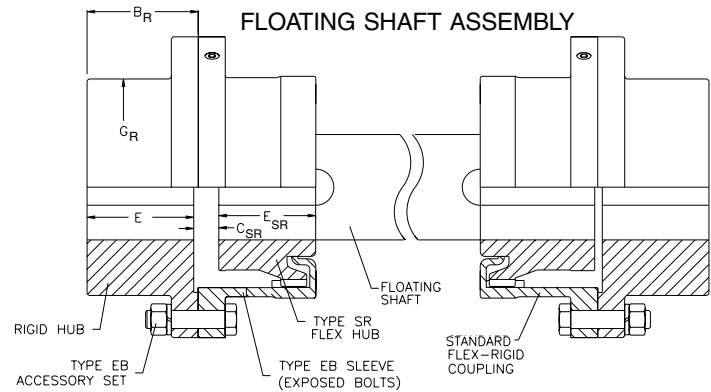
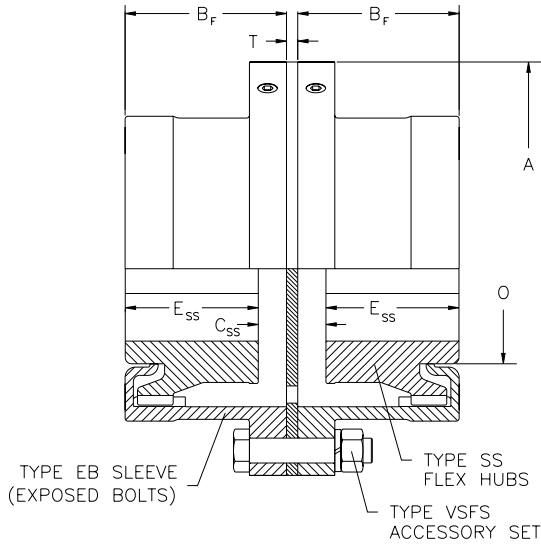
A rigid-rigid coupling is offered for applications where neither angular nor offset misalignment are present. Vertical applications should be referred to KOP-FLEX engineering for review.

One complete coupling is comprised of (2) rigid hubs and (1) set of accessories. A gasket is not used between the flanges.

Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Dimensions			
					A	C _{RR}	E _R	G _R
1	2 1/4	12	7500	15000	4 9/16	3/16	1 9/16	3
1 1/2	2 11/16	27	17000	34000	6	3/16	1 27/32	3 13/16
2	3 3/8	50	31500	63000	7	3/16	2 9/32	4 13/16
2 1/2	4	90	56700	113400	8 3/8	3/16	2 29/32	5 3/4
3	4 3/4	160	101000	202000	9 7/16	3/16	3 15/32	6 3/4
3 1/2	5 1/2	235	148000	296000	11	3/16	4 1/32	7 3/4
4	6 3/8	375	236000	472000	12 1/2	3/8	4 7/16	9
4 1/2	7 1/4	505	318000	636000	13 5/8	3/8	5 1/16	10 1/8
5	8 1/2	700	441000	882000	15 5/16	3/8	5 11/16	11 3/8
5 1/2	8	920	580000	1160000	16 3/4	3/8	6 31/32	10 3/4
6	8 3/4	1205	759000	1518000	18	3/8	7 15/32	11 1/2
7	10	1840	1160000	2320000	20 3/4	1/2	8 3/4	13 3/8



The FAST'S Short Slide coupling is designed for drive systems that require greater end float or slide than a conventional application, providing two to three times the slide of a standard coupling. The coupling uses standard EB sleeves with flex hubs modified for more end float, along with a stop plate designed to maximize the total slide by equalizing the slide in each half. Spacer couplings, floating shaft arrangements, and most coupling types can be supplied with a Short Slide flex half in one or both flex half couplings.



Coupling Size*	Total Slide①		Dimensions										
	Full-Flex	Flex-Rigid	A	B _F	B _R	C _{SS} ① Hub & Shaft Separation		C _{SR} ① Hub & Shaft Separation		E _{SS}	E _{SR}	T	O
						Max.	Min.	Max.	Min.				
1 1/2	7/16	3/16	6	2	1 15/16	19/32	5/32	13/64	1/64	1 13/16	1 15/16	1/8	2 3/16
2	9/16	9/32	7	2 15/32	2 3/8	23/32	5/32	19/64	1/64	2 1/4	2 11/32	1/8	2 7/8
2 1/2	3/4	3/8	8 3/8	3 9/32	3	29/32	5/32	25/64	1/64	2 13/16	2 29/32	1/8	3 5/8
3	7/8	7/16	9 7/16	3 21/32	3 9/16	1 1/32	5/32	29/64	1/64	3 5/16	3 13/32	1/8	4 1/4
3 1/2	1	1/2	11	4 1/4	4 1/8	1 1/4	1/4	17/32	1/32	3 7/8	3 31/32	3/16	5
4	1 1/8	9/16	12 1/2	4 7/8	4 5/8	1 3/8	1/4	19/32	1/32	4 3/8	4 9/16	3/16	5 3/4
4 1/2	1 5/16	21/32	13 5/8	5 15/32	5 1/4	1 9/16	1/4	11/16	1/32	4 29/32	5 3/32	3/16	6 1/2
5	1 7/16	23/32	15 5/16	6 1/32	5 7/8	1 11/16	1/4	3/4	1/32	5 9/16	5 3/4	3/16	7 5/16
5 1/2	1 7/16	23/32	16 3/4	6 29/32	7 5/32	1 3/4	5/16	3/4	1/32	6 7/16	6 11/16	1/4	8
6	1 3/8	11/16	18	7 13/32	7 21/32	1 23/32	11/32	47/64	3/64	6 15/16	7 3/16	1/4	8 13/16
7	2 9/16	1 9/32	20 3/4	8 21/32	9	2 31/32	13/32	1 21/64	3/64	7 11/16	8	5/16	10 5/16

* Exposed bolts are standard for all sizes.

① Values are based on using Type SS flex hubs in a full-flex coupling and Type SR flex hub in a flex-rigid assembly. For each Type SR flex hub substituted in a full-flex unit, total slide and C maximum are reduced by the amount of (E_{SR}-E_{SS}). Substitution of a Type SS flex hub in a flex-rigid coupling increases C_{FR} maximum and C_{FR} minimum by the amount of (E_{SR}-E_{SS}), but total slide cannot be increased without derating the coupling.

Note: For ratings, max. bores and additional dimensions, see page 58.

Coupling Size	Full Flex Coupling			Stop Plate		Fastener Set (Includes Gasket)		Short Slide Flex Hub (Full Flex)		Short Slide Flex Hub (Flex Rigid)	
	No Bore Part No.	Wt.	Finish Bore① Part No.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.	No Bore Part No.	Wt.
1 1/2	1 1/2F EB SSFF	18	1 1/2F EB SSFF FB	1 1/2 EB SP	1	1 1/2 EB VSFS	1	1 1/2F SSHUB	3	1 1/2F SRHUB	3
2	2F EB SSFF	28	2F EB SSFF FB	2 EB SP	2	2 EB VSFS	2	2F SSHUB	6	2F SRHUB	6
2 1/2	2 1/2F EB SSFF	50	2 1/2F EB SSFF FB	2 1/2 EB SP	2	2 1/2 EB VSFS	2	2 1/2F SSHUB	11	2 1/2F SRHUB	11
3	3F EB SSFF	74	3F EB SSFF FB	3 EB SP	3	3 EB VSFS	3	3F SSHUB	18	3F SRHUB	18
3 1/2	3 1/2F EB SSFF	110	3 1/2F EB SSFF FB	3 1/2 EB SP	4	3 1/2 EB VSFS	5	3 1/2F SSHUB	26	3 1/2F SRHUB	26
4	4F EB SSFF	170	4F EB SSFF FB	4 EB SP	7	4 EB VSFS	5	4F SSHUB	44	4F SRHUB	44
4 1/2	4 1/2F EB SSFF	230	4 1/2F EB SSFF FB	4 1/2 EB SP	10	4 1/2 EB VSFS	7	4 1/2F SSHUB	62	4 1/2F SRHUB	62
5	5F EB SSFF	350	5F EB SSFF FB	5 EB SP	12	5 EB VSFS	9	5F SSHUB	90	5F SRHUB	90
5 1/2	5 1/2F EB SSFF	400	5 1/2F EB SSFF FB	5 1/2 EB SP	15	5 1/2 EB VSFS	14	5 1/2F SSHUB	105	5 1/2F SRHUB	105
6	6F EB SSFF	470	6F EB SSFF FB	6 EB SP	19	6 EB VSFS	14	6F SSHUB	130	6F SRHUB	130
7	7F EB SSFF	790	7F EB SSFF FB	7 EB SP	25	7 EB VSFS	22	7F SSHUB	210	7F SRHUB	210

* Exposed bolts are standard for all sizes. Shrouded bolts are available through size 5.

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

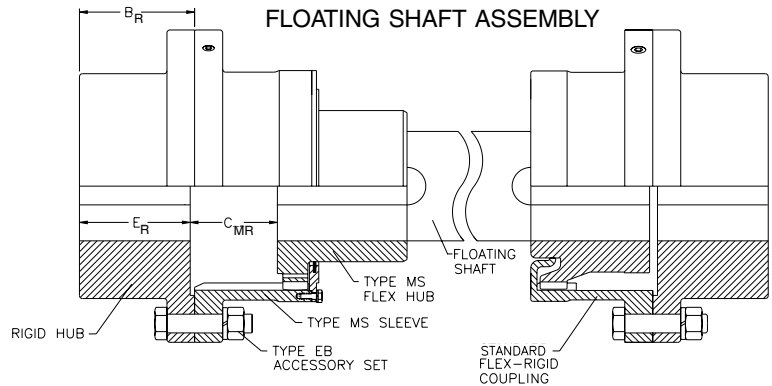
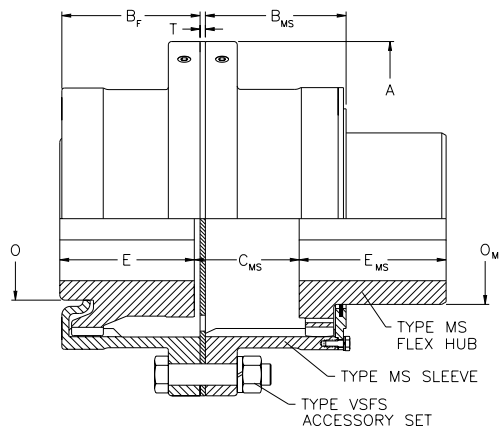
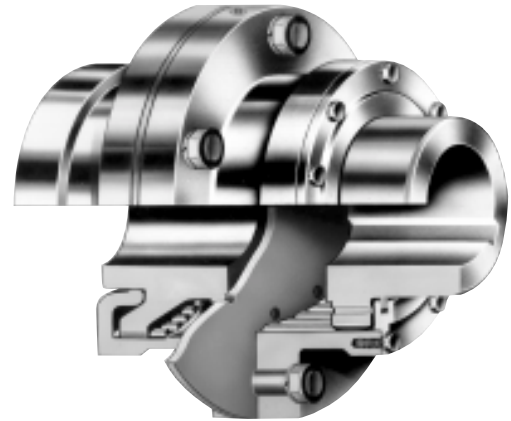
Note: For finish bored flex hubs, add FB and the bore size.

Medium Slide Coupling

The FAST'S Medium Slide coupling is designed for applications that require a large amount of slide, and is particularly suitable for disc refiners for the paper industry and bridge drives for overhead cranes.

For full-flex couplings, a Medium Slide half is used with either a FAST'S or Series H flex half coupling and a stop plate. The Medium Slide flex hub has crowned tooth tips for piloting, and lube passage holes to minimize piston effect.

A Medium slide half can be bolted to a FAST'S Short Slide or a Series H Slide coupling half, with a stop plate, for increased slide capacity. Spacer couplings, floating shaft arrangements, and most coupling types can be supplied with one Medium Slide half coupling.



Coupling Size*	Total Slide		Maximum Bore with Standard Key	Dimensions										
	Full- Flex	Flex- Rigid	Type MS Flex Hub	A	B _{MS}	C _{MS}		C _{MR}		E _{MS}	G _{MS}	T	O	O _{MS}
						Hub and Shaft Separation		Hub and Shaft Separation						
						Max.	Min.	Max.	Min.					
1 1/2	1 37/64	1 9/16	1 5/8	6	2 11/32	1 47/64	5/32	1 37/64	1/64	2 1/2	4	1/8	2 3/16	2 5/16
2	1 61/64	1 15/16	2 1/8	7	2 27/32	2 7/64	5/32	1 61/64	1/64	3 1/32	5	1/8	2 7/8	3 1/32
2 1/2	2 33/64	2 7/16	2 3/4	8 3/8	3 17/32	2 43/64	5/32	2 29/64	1/64	3 23/32	5 15/16	1/8	3 5/8	3 7/8
3	3 1/64	2 15/16	3 1/4	9 7/16	4 5/32	3 11/64	5/32	2 61/64	1/64	4 5/16	6 15/16	1/8	4 1/4	4 19/32
3 1/2	3 7/32	3 7/64	3 3/4	11	4 15/32	3 15/32	1/4	3 9/64	1/32	4 11/16	7 29/32	3/16	5	5 11/32
4	3 29/64	3 7/16	4 1/4	12 1/2	4 31/32	3 45/64	1/4	3 15/32	1/32	5 3/16	9 1/4	3/16	5 3/4	6 1/16
4 1/2	4 1/64	3 15/16	5	13 5/8	5 19/32	4 17/64	1/4	3 31/32	1/32	5 13/16	10 3/8	3/16	6 1/2	7 5/32
5	4 29/64	4 3/8	5 1/2	15 5/16	6 5/32	4 45/64	1/4	4 13/32	1/32	6 3/8	11 9/16	3/16	7 5/16	7 3/4
5 1/2	4 25/32	4 49/64	6	16 3/4	6 11/16	5 3/32	5/16	4 51/64	1/32	7	12 7/8	1/4	8	8 3/4
6	5 7/64	5 1/8	6 1/2	18	7 3/8	5 29/64	11/32	5 11/64	3/64	7 1/2	13 7/8	1/4	8 13/16	9 5/16
7	6 3/64	6 1/16	8 1/8	20 3/4	8 9/16	6 29/64	13/32	6 7/64	3/64	8 11/16	16 1/4	5/16	10 5/16	11

* Exposed bolts are standard for all sizes.

Note: For ratings, max. bores and additional dimensions, see page 58.

Coupling Size	Full Flex Coupling			Stop Plate		Medium Slide Sleeve Assembly		Fastener Set (Includes Gasket)		Medium Slide Flex Hub	
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.
1 1/2	1 1/2F EB MSFF	18	1 1/2F EB MSFF FB	1 1/2 EB SP	1	1 1/2F EB MSSLEEVE	10	1 1/2 EB VSFS	1	1 1/2F MSHUB	4
2	2F EB MSFF	30	2F EB MSFF FB	2 EB SP	2	2F EB MSSLEEVE	12	2 EB VSFS	1	2F MSHUB	8
2 1/2	2 1/2F EB MSFF	53	2 1/2F EB MSFF FB	2 1/2 EB SP	2	2 1/2F EB MSSLEEVE	18	2 1/2 EB VSFS	2	2 1/2F MSHUB	13
3	3F EB MSFF	78	3F EB MSFF FB	3 EB SP	3	3F EB MSSLEEVE	20	3 EB VSFS	3	3F MSHUB	21
3 1/2	3 1/2F EB MSFF	117	3 1/2F EB MSFF FB	3 1/2 EB SP	4	3 1/2F EB MSSLEEVE	33	3 1/2 EB VSFS	5	3 1/2F MSHUB	33
4	4F EB MSFF	170	4F EB MSFF FB	4 EB SP	7	4F EB MSSLEEVE	46	4 EB VSFS	5	4F MSHUB	50
4 1/2	4 1/2F EB MSFF	219	4 1/2F EB MSFF FB	4 1/2 EB SP	10	4 1/2F EB MSSLEEVE	60	4 1/2 EB VSFS	7	4 1/2F MSHUB	70
5	5F EB MSFF	337	5F EB MSFF FB	5 EB SP	12	5F EB MSSLEEVE	90	5 EB VSFS	9	5F MSHUB	100
5 1/2	5 1/2F EB MSFF	422	5 1/2F EB MSFF FB	5 1/2 EB SP	15	5 1/2F EB MSSLEEVE	100	5 1/2 EB VSFS	14	5 1/2F MSHUB	120
6	6F EB MSFF	526	6F EB MSFF FB	6 EB SP	19	6F EB MSSLEEVE	115	6 EB VSFS	14	6F MSHUB	150
7	7F EB MSFF	828	7F EB MSFF FB	7 EB SP	25	7F EB MSSLEEVE	174	7 EB VSFS	22	7F MSHUB	260

* Exposed bolts are standard for all sizes.

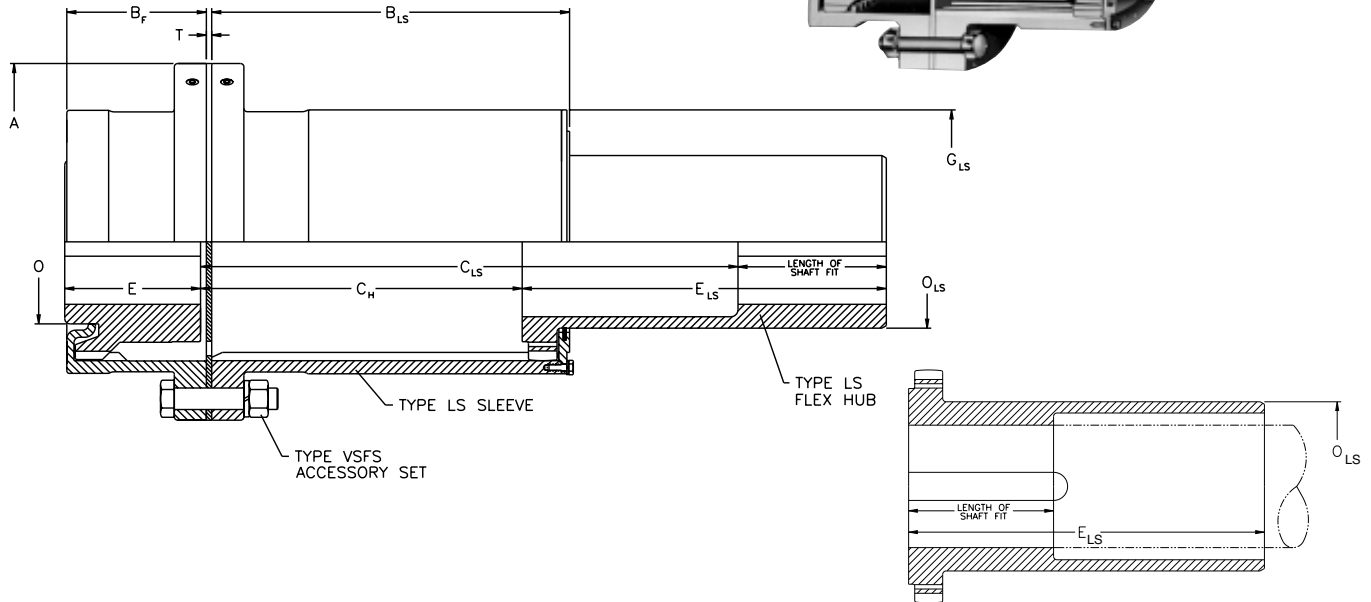
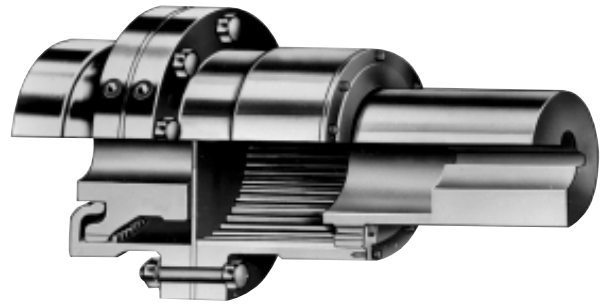
① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Note: For finish bored flex hubs, add FB and the bore size.

The FAST'S Long Slide coupling is designed for applications that require a very large amount of slide, and is used extensively in steel and aluminum rolling mills on coilers and similar applications.

The hub counterbore assures the same normal shaft fit length. For applications requiring minimal shaft separations, the counterbore is reversed to provide an equivalent inner end shaft fit.

The long slide half may be bolted to either a FAST'S or Series "H" Flex half.



Coupling Size*	Total Slide①	Maximum Bore with Standard Key	Full-Flex Dimensions②											Length of Shaft Fit in Long Slide Hub
			A	B _{LS}	C _{LS}		C _H		E _{LS}	G _{LS}	T	O	O _{LS}	
	Shaft Separation				Shaft Separation									
	Full- Flex	Type LS Flex Hub			Max.	Min.	Max.	Min.						
1 1/2	5 1/2	1 5/8	6	6 17/64	9 37/64	4 5/64	5 21/32	5/32	6 27/64	4	1/8	2 3/16	2 5/16	2 1/2
2	5 1/2	2 1/8	7	6 25/64	9 13/64	3 45/64	5 21/32	5/32	6 37/64	5	1/8	2 7/8	3 1/32	3 1/32
2 1/2	8	2 3/4	8 3/8	9 1/64	13 41/64	5 41/64	8 5/32	5/32	9 13/64	5 15/16	1/8	3 5/8	3 7/8	3 23/32
3	11	3 1/4	9 7/16	12 9/64	19 9/64	8 9/64	11 5/32	5/32	12 19/64	6 15/16	1/8	4 1/4	4 19/32	4 5/16
3 1/2	11	3 3/4	11	12 1/4	19 1/32	8 1/32	11 1/4	1/4	12 15/32	7 29/32	3/16	5	5 11/32	4 11/16
4	11	4 1/4	12 1/2	12 33/64	18 51/64	7 51/64	11 1/4	1/4	12 47/64	9 1/4	3/16	5 3/4	6 1/16	5 3/16
4 1/2	11	5	13 5/8	12 37/64	18 15/64	7 15/64	11 1/4	1/4	12 51/64	10 3/8	3/16	6 1/2	7 5/32	5 13/16
5	11	5 1/2	15 5/16	12 45/64	17 51/64	6 51/64	11 1/4	1/4	12 59/64	11 9/16	3/16	7 5/16	7 3/4	6 3/8
5 1/2	10 1/2	6	16 3/4	12 13/32	16 17/32	6 1/32	10 13/16	5/16	12 23/32	12 7/8	1/4	8	8 3/4	7
6	10 1/2	6 1/2	18	12 49/64	16 15/64	5 47/64	10 29/32	11/32	12 57/64	13 7/8	1/4	8 13/16	9 5/16	7 1/2
7	10 1/2	8 1/8	20 3/4	13 1/64	15 23/64	4 55/64	10 29/32	13/32	13 9/64	16 1/4	5/16	10 5/16	11	8 11/16

* Exposed bolts are standard for all sizes.

① Using correct length of shaft fit in Type LS flex hub, and if the connected machines permit a hub separation range from C_H maximum to C_H minimum.

② For flex-rigid couplings, refer to KOP-FLEX.

Note: For ratings, max. bores and additional dimensions, see page 54.

Coupling Size	Full Flex Coupling			Stop Plate		Long Slide Sleeve Assembly		Fastener Set (Includes Gasket)		Long Slide Flex Hub	
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.
1 1/2	1 1/2F EB LSFF	24	1 1/2F EB LSFF FB	1 1/2 EB SP	1	1 1/2F EB LSSLEEVE	9	1 1/2 EB VSFS	1	1 1/2F LSHUB	6
2	2F EB LSFF	38	2F EB LSFF FB	2 EB SP	2	2F EB LSSLEEVE	12	2 EB VSFS	1	2F LSHUB	12
2 1/2	2 1/2F EB LSFF	69	2 1/2F EB LSFF FB	2 1/2 EB SP	2	2 1/2F EB LSSLEEVE	24	2 1/2 EB VSFS	2	2 1/2F LSHUB	20
3	3F EB LSFF	109	3F EB LSFF FB	3 EB SP	3	3F EB LSSLEEVE	29	3 EB VSFS	3	3F LSHUB	36
3 1/2	3 1/2F EB LSFF	157	3 1/2F EB LSFF FB	3 1/2 EB SP	4	3 1/2F EB LSSLEEVE	46	3 1/2 EB VSFS	5	3 1/2F LSHUB	40
4	4F EB LSFF	220	4F EB LSFF FB	4 EB SP	7	4F EB LSSLEEVE	62	4 EB VSFS	5	4F LSHUB	82
4 1/2	4 1/2F EB LSFF	278	4 1/2F EB LSFF FB	4 1/2 EB SP	10	4 1/2F EB LSSLEEVE	87	4 1/2 EB VSFS	7	4 1/2F LSHUB	104
5	5F EB LSFF	407	5F EB LSFF FB	5 EB SP	12	5F EB LSSLEEVE	138	5 EB VSFS	9	5F LSHUB	175
5 1/2	5 1/2F EB LSFF	504	5 1/2F EB LSFF FB	5 1/2 EB SP	15	5 1/2F EB LSSLEEVE	158	5 1/2 EB VSFS	14	5 1/2F LSHUB	198
6	6F EB LSFF	611	6F EB LSFF FB	6 EB SP	19	6F EB LSSLEEVE	187	6 EB VSFS	14	6F LSHUB	256
7	7F EB LSFF	913	7F EB LSFF FB	7 EB SP	25	7F EB LSSLEEVE	243	7 EB VSFS	22	7F LSHUB	402

* Exposed bolts are standard for all sizes.

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Note: For finish bored flex hubs, add FB and the bore size.

Parts of cutout couplings are commonly used on dual drives having an auxiliary prime mover, usually an engine or turbine, for emergency use. The changeover is performed at standstill by disengaging the coupling on the primary driver and engaging the coupling on the standby drive. With one cutout coupling, a unidirectional drive can be disconnected to permit partial system reversal. The first unit of a tandem drive can be similarly cut out.

The cutout sleeve contains a standard internal gear. When the cutout hub meshes with these gear teeth, the coupling is engaged. When the sleeve assembly is shifted axially these hub teeth disengage and the coupling is cut out. The shifter sleeve has long internal teeth which stay in mesh with the shifter hub regardless of axial position. A support ring on the shifter hub pilots on the ends of the mating sleeve teeth to rigidly position the sleeve assembly when cut out. The groove on the cutout hub permits clearance at the all-metal end ring for the cutout hub to rotate while the other components are idle. A unique all-metal hub seal contacts the shifter hub at all times.

Type FCH is designed for on-site manual shifting with both shafts idle. The shifter sleeve has two handlock screws located diametrically opposite in standard lube holes. As shifting to either the engaged or disengaged position is performed by hand, the sleeve flanges and the handlock screws must be readily accessible.

Type FCC is identical to the Type FCH with three exceptions. A Type SH Shifter Collar is furnished with the coupling, two Type FS lube plugs are substituted for the handlock screws in the Type SC shifter sleeve flange, and the words HAND LOCK are omitted. The manganese-bronze shifter collar is precision machined in two halves which are bolted together. Each half is provided with a pipe plug which permits substitution of commercial grease fittings. The replaceable trunnion pins

are retained by spring pins. Suitable means must be provided to position the shifter collar, support its weight, and secure it in both the engaged and disengaged positions of the sleeve assembly.

Type FCCM is an integrated coupling package engineered to provide these means for complete and safe hand operation by combining a Type CM Manual Shifter Mechanism with a Type FCC coupling. This mechanism consists of one or two base-mounted pedestals supporting a fabricated yoke which is actuated by a hand lever. Three sizes of pedestals permits flexibility in foundation design. The pedestal column provides additional height adjustment, which is then positively secured by a support spacer.

Two yoke arms operate the shifter collar. The hand lever may be mounted on either side and with the handle up or down. A detent pin secures the lock bar to the angle bracket, maintaining the coupling in its selected operating position. Sufficient space is provided to add a thru-hole for a padlock.

MODIFICATIONS

As standard modifications to cutout couplings are limited, all special requirements should be referred to KOP-FLEX.

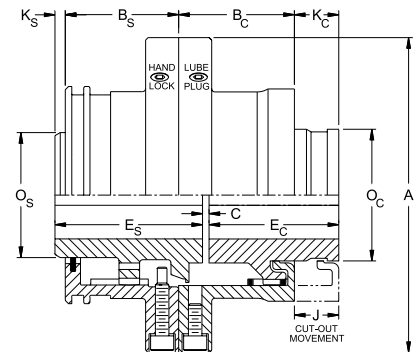
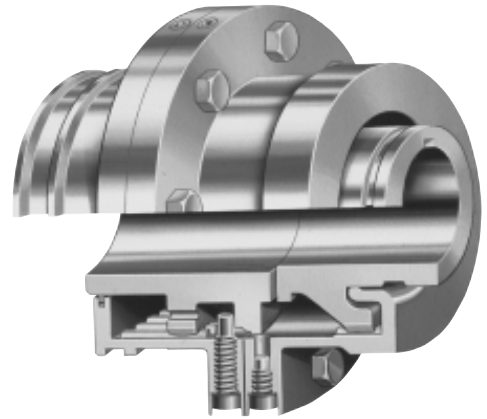
Clearance fits with setscrews are not available.

Limited end float, extra keyways, and taper bores can be provided.

For mounting on AISE mill motors, or on other tapered shafts with locknuts, equivalent Types MCH, MCC and MCCM are available.

For increased shaft separation using a spacer or floating shaft, cutout couplings require special support consideration.

To facilitate remeshing within the cutout half, the outer end of each hub tooth and the inner end of each sleeve tooth can be pointed.



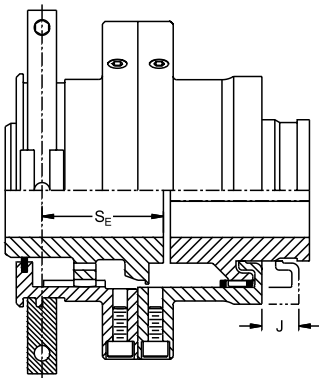
Type FCH Cut-Out Coupling

Coupling Size	Maximum Bore with Standard Key		Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM)	Dimensions (inches)										
	Shifter Hub	Cut-out Hub					A	B _c	B _s	C	E _c	E _s	J	K _c	K _s	O _c	O _s
1 1/2	1 5/8	1 1/2	27	17000	34000	12000	6	2 3/32	2 3/32	1/8	2 7/32	2 23/32	11/16	11/16	3/16	2 11/64	2 5/16
2	2 1/8	2	50	31500	63000	9300	7	2 19/32	2 19/32	1/8	2 25/32	3 11/32	7/8	7/8	3/16	2 55/64	3 1/32
2 1/2	2 3/4	2 1/2	90	56700	113400	7900	8 3/8	3 7/32	3 7/32	3/16	3 13/32	4 7/32	1 1/8	1 1/8	1/4	3 19/32	3 7/8
3	3 1/4	3	160	101000	202000	6800	9 7/16	3 27/32	3 27/32	3/16	4 1/32	5 1/32	1 5/16	1 5/16	1/4	4 3/16	4 19/32
3 1/2	3 3/4	3 1/2	235	148000	296000	6000	11	4 7/16	4 17/32	1/4	4 3/4	5 29/32	1 9/16	1 9/16	3/8	4 7/8	5 11/32
4	4 1/4	4	375	236000	472000	5260	12 1/2	5 1/16	5 1/16	1/4	5 5/16	6 3/4	1 3/4	1 3/4	7/16	5 19/32	6 1/16
4 1/2	5	4 1/2	505	318000	636000	4770	13 5/8	5 11/16	5 11/16	5/16	5 13/16	7 3/4	2	2	1/2	6 3/8	7 5/32
5	5 1/2	5	700	441000	882000	4300	15 5/16	6 5/16	6 1/4	5/16	6 1/8	8 3/8	2 3/16	1 23/32	17/32	7 5/32	7 3/4
5 1/2	6	5 1/2	920	580000	1160000	3880	16 3/4	6 15/16	6 11/16	5/16	6 29/32	9 15/32	2 7/16	2 7/16	5/8	7 13/16	8 3/4
6	6 1/2	6	1205	759000	1518000	3600	18	7 7/16	7 3/8	5/16	7 13/32	10 9/32	2 9/16	2 9/16	5/8	8 5/8	9 5/16
7	8 1/8	7	1840	1160000	2320000	3000	20 3/4	8 11/16	8 9/16	3/8	8 11/16	12 3/16	3 3/8	3 3/8	5/8	10 3/16	11

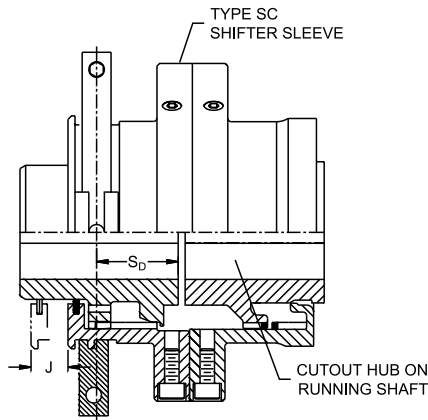
* Exposed bolts are standard for all sizes.

Type SH Shifter Collar & Type CM Manual Shifter Mechanism

ENGAGED POSITION

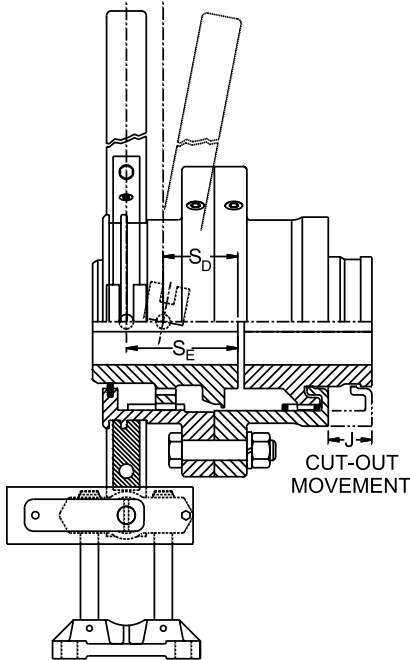


DISENGAGED POSITION

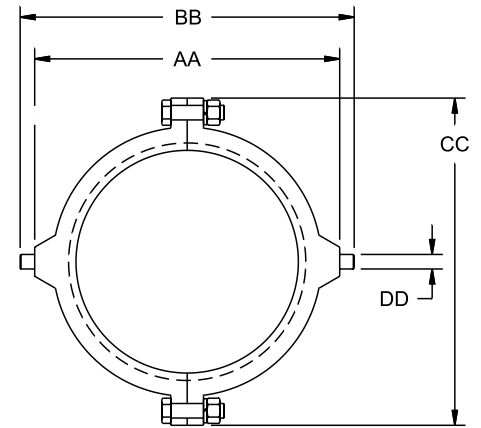


Type FCC Cutout Coupling

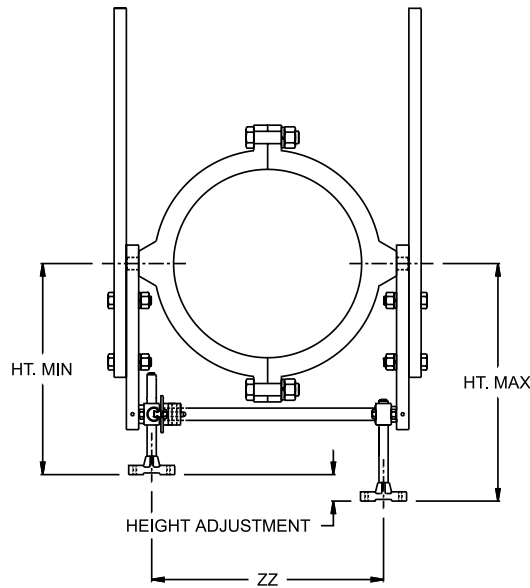
SHIFTER COLLAR
(ENGAGED) SHIFTER COLLAR
(DISENGAGED)



Type FCCM Cut-Out Coupling



TYPE SH SHIFTER COLLAR



Type CM Manual Shifter Mechanism



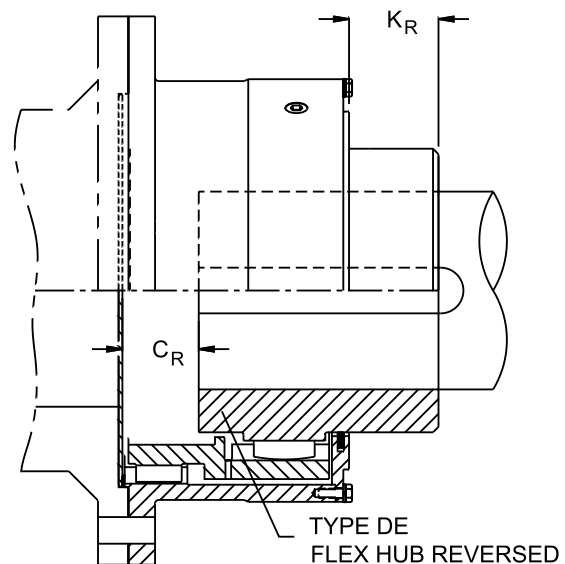
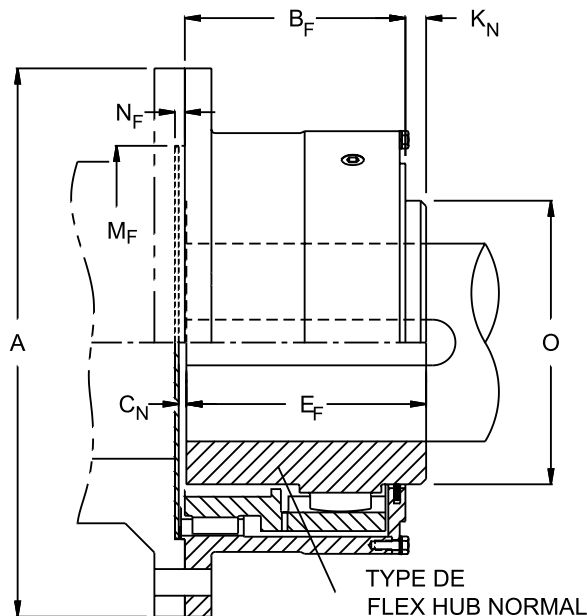
Coupling Size	Center Line of Shifter Collar		Shifter Collar Dimensions			
	SE Engaged	SD Disengaged	AA + 0 - 1/16	BB	CC	DD ±.0005
1 1/2	2 3/32	1 13/32	6	7	6 1/4	0.250
2	2 1/2	1 5/8	7	8	7 3/8	0.375
2 1/2	3 3/16	2 1/16	8 1/2	9 3/4	8 3/4	0.500
3	3 15/16	2 5/8	9 1/2	10 3/4	10	0.500
3 1/2	4 7/32	2 21/32	11	12 1/4	11 3/8	0.625
4	4 27/32	3 3/32	12 1/2	13 3/4	12 3/8	0.625
4 1/2	5 5/8	3 5/8	13 1/2	15	14 1/2	0.750
5	6 7/32	4 1/32	15 1/2	17	16	0.750
5 1/2	6 29/32	4 15/32	17	18 3/4	18	0.875
6	7 15/32	4 29/32	18 1/4	20	19 1/4	0.875
7	8 13/16	5 7/16	21	23	22 1/2	1.000

① Pedestal sizes PS, PM, or PT are used with coupling sizes #1 1/2 - #5. Pedestal sizes PU, PV, or PW are used with coupling sizes #5 1/2 - #7.

Type DE couplings features double engagement gearing, using an inner sleeve having both internal and external teeth, in a single flanged sleeve. It can be bolted to any rotating flywheel, shaft, drum, etc. to connect either a driving or driven machine with shaft extension, eliminating the need for a stub shaft with a conventional gear coupling. All DE couplings can be used in vertical application. Hubs are reversible and can be cut off to accommodate AISE mill motors or equivalent tapered shafts with locknuts.

The 'DE' coupling has some unique features:

- Reduces cost by eliminating a part - stub shaft used on conventional couplings;
- Reduces weight and inertia (WR²);
- Bolted end ring design simplifies installation, removal, inspection and maintenance;
- Saves space and lowers installation cost.



Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Max Speed (RPM)	Dimensions (inches)											Counterbore Required in Connecting Part	
						A	B _F	C _N	C _R		E _F	K _N	K _R		O	M _F	N _F	
									Min.	Max.			Min.	Max.		Diameter	Depth	
																+0.002 -0.000	+0.005 -0.000	
1 1/2	1 5/8	27	17000	34000	12000	6	2 7/32	3/16	3/8	17/32	2 15/32	9/32	15/32	5/8	2 5/16	3.561	0.293	
2	2 1/8	50	31500	63000	9300	7	2 23/32	3/16	21/32	7/8	3	5/16	25/32	1	3 1/32	4.561	0.293	
2 1/2	2 3/4	90	56700	113400	7900	8 3/8	3 13/32	3/16	13/6	1 1/8	3 3/4	3/8	7/8	1 5/16	3 7/8	5.436	0.293	
3	3 1/4	160	101000	202000	6800	9 7/16	4 1/32	3/16	27/32	1 9/16	4 7/16	7/16	1 3/32	1 13/16	4 19/32	6.436	0.293	
3 1/2	3 3/4	235	148000	296000	6000	11	4 3/8	3/16	1 3/32	1 11/32	4 27/32	1/2	1 13/32	1 21/32	5 11/32	7.374	0.293	
4	4 1/4	375	236000	472000	5260	12 1/2	4 27/32	7/32	1 11/32	1 9/16	5 11/32	17/32	1 21/32	1 7/8	6 1/16	8.749	0.324	
4 1/2	5	505	318000	636000	4770	13 5/8	5 15/32	7/32	1 7/16	1 25/32	6 3/16	3/4	1 31/32	2 5/16	7 5/32	9.749	0.324	
5	5 1/2	700	441000	882000	4300	15 5/16	6 1/32	7/32	1 25/32	2 15/32	6 5/8	5/8	2 3/16	2 7/8	7 3/4	10.749	0.324	
5 1/2	6	920	580000	1160000	3880	16 3/4	6 9/16	1/4	1 23/32	2 7/16	7 5/16	13/16	2 9/32	3	8 3/4	11.911	0.324	
6	6 1/2	1205	759000	1518000	3600	18	7 1/4	1/4	1 7/8	2 1/2	7 7/8	11/16	2 5/16	2 15/16	9 5/16	12.916	0.324	
7	8 1/8	1840	1160000	2320000	3000	20 3/4	8 15/32	1/4	2 7/32	3 9/16	9 1/16	21/32	2 5/8	3 31/32	11	14.947	0.324	

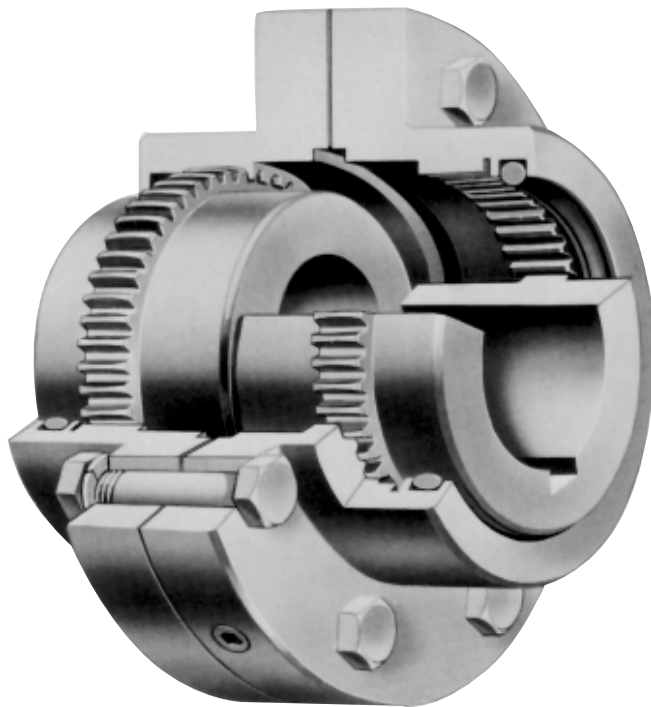
Series H

Gear Couplings

Size 1 through 30

Most Economical
Gear Coupling Design

Large Bore Capacity,
with O-ring Seal



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The Series H Advantages:

Higher Misalignment Capability

Sizes 1-7 compensate for up to $\pm 1\frac{1}{2}^\circ$ static angular misalignment per gear mesh.

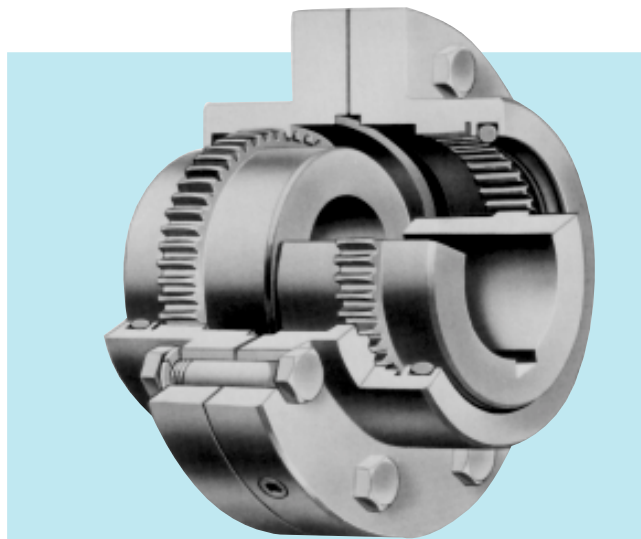
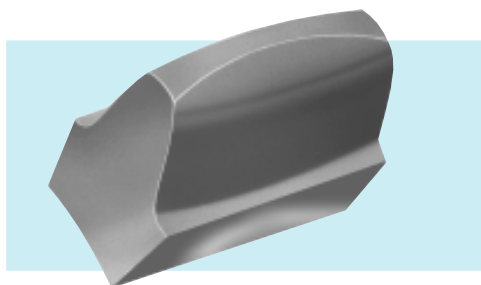
Larger Bore Capabilities allow the most economical size selection for shafts up to $10\frac{5}{8}"$.

Higher Torque Ratings thanks to larger tooth pitch diameters than other couplings.

Versatility in that Series H's are interchangeable by half coupling with competitive coupling designs.

$1\frac{1}{2}^\circ$ Curved-Face Teeth are a prime feature of the KOP-FLEX Series H coupling, sizes 1-7. The crowned hub teeth are a 20° full-depth involute tooth form with flank, tip, and root curvature. When used with the straight faced sleeve teeth, these $1\frac{1}{2}^\circ$ curved face hubs offer increased shaft misalignment capability.

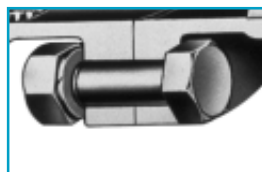
Full Length Sleeve Tooth for reverse hub mounting with no disengagement.



Crowned Tooth Sizes 1 - 7

Center Flange Bolting:

All KOP-FLEX couplings feature precision-drilled flange bolt holes, and tight tolerance Grade 5 flange bolts to assure a long-lasting flange to flange and fastener fit. Exposed bolt flanges are standard. Shrouded bolt flanges can be supplied through size 5. Size $\#5\frac{1}{2}$ and larger couplings are only available with exposed bolt flanges.



KOP-FLEX Coupling Greases

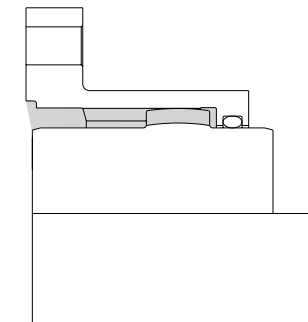
KOP-FLEX offers greases specifically designed for use in coupling applications. To ensure proper lubrication and long service life, use KOP-FLEX KSG Standard Coupling Grease, or KHP High Performance Coupling Grease. See page 101 for detailed specifications.

Lubrication:

Each sleeve flange is supplied with two pipe plugs 180° apart. This permits assembly of a full flex coupling with four lube plugs positioned every 90° , facilitating lubrication.

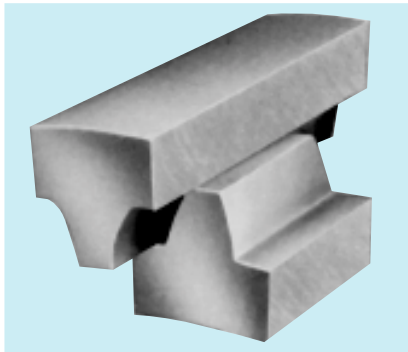


The lube seal is a Buna-N "O" ring to retain grease and exclude contaminants. KOP-FLEX KHP or KSG coupling greases are recommended in order to obtain maximum operating life.



Series H couplings of Size 8 to 30 are designed for $\pm 1/2^\circ$ misalignment per flex half coupling, to compensate for misalignment between the shafts in a full-flex coupling.

Series H couplings can be supplied in full-flex, flex-rigid, floating shaft and spacer arrangements as well as custom designs. Only exposed bolt flanges are available in sizes 8 to 30.

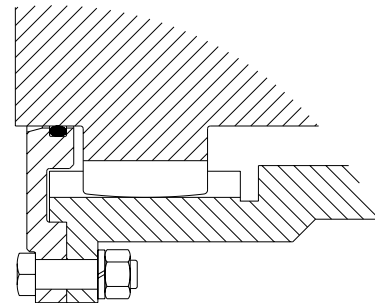


The straight-faced, involute stub tooth form is used in the Series H coupling, sizes 8 to 30. This tooth form distributes contact pressures across the full length of the hub tooth, to best develop the needed lubricating film, minimizing tooth wear and extending coupling service life for years of operation.

The End Rings are removable for ease of assembly and to allow inspection of the gear sets. A Buna-N "O" ring seal is incorporated to exclude contaminants and retain the lubricant. Designed for grease lubrication, KOP-FLEX KSG or KHP coupling greases are recommended to obtain maximum operating life.

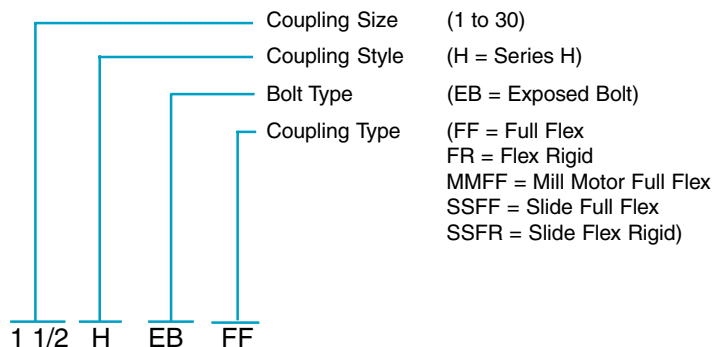


Straight Tooth Sizes 8 - 30



HOW TO ORDER

PART NUMBER EXPLANATION Complete Rough Bore Coupling



Coupling Parts

Description

*FHUB = Flex Hub
 *RHUB = Rigid Hub
 *MMHUB = Mill Motor Hub
 SLEEVE = Standard Sleeve
 SSLEEVE = Slide Sleeve
 FS = Fastener Set (w/gasket)
 ERFS = End Ring Fastener Set
 VSFS = Vertical/Slide Fastener Set (w/gasket)
 LEFD = LEF Disk
 SPRxxx = Spacer for x.xx shaft separation
 SP = Stop Plate for Slide Couplings
 VP = Vertical Plate

* For finish bored hubs, add FB and bore size.
 All finish bores and keyways per
 AGMA 9002-A86 with interference fits.
 Clearance bores are available on request
 with one setscrew over keyway.

1 1/2H FHUB FB

Values listed are intended only as a general guide, and are typical of usual service requirements. For systems which frequently utilize the peak torque capability of the power source, verify that the magnitude of this peak torque does not exceed the 1.0 Service Factor Rating of the coupling selected. Applications which involve extreme repetitive shock or high-energy load absorption characteristics should be referred — with full particulars — to KOP-FLEX.

Values contained in the table are to be applied to smooth power sources such as electric motors and steam turbines. For drives involving internal combustion, engines of four or five cylinders, add 1.0 to the values listed, for six or more cylinders, add 0.5 to the values listed. For systems utilizing AC or DC Mill Motors as the prime mover refer to Note (1).

Application	Typical Service Factor
AGITATORS	
Pure Liquids	1.0
Liquids & Solids	1.25
Liquids — Variable Density	1.25
BLOWERS	
Centrifugal	1.0
Lobe	1.5
Vane	1.25
BRIQUETTE MACHINES	2.0
CAR PULLERS — Intermittent Duty	1.5
COMPRESSORS	
Centrifugal	1.0
Centriaxial	1.25
Lobe	1.5
Reciprocating — Multi-Cylinder	2.0
CONVEYORS — LIGHT DUTY	
UNIFORMLY FED	
Apron, Bucket, Chain, Flight, Screw	1.25
Assembly, Belt	1.0
Oven	1.5
CONVEYORS — HEAVY DUTY	
NOT UNIFORMLY FED	
Apron, Bucket, Chain, Flight, Oven	1.5
Assembly, Belt	1.25
Reciprocating, Shaker	2.5
CRANES AND HOISTS (NOTE 1 and 2)	
Main hoists, Reversing	2.5
Skip Hoists, Trolley & Bridge Drives	2.0
Slope	2.0
CRUSHERS	
Ore, Stone	3.0
DREDGES	
Cable Reels	1.75
Conveyors	1.5
Cutter Head Jig Drives	2.5
Maneuvering Winches	1.75
Pumps	1.75
Screen Drives	1.75
Stackers	1.75
Utility Winches	1.5
ELEVATORS (NOTE 2)	
Bucket	1.75
Centrifugal & Gravity Discharge	1.5
Escalators	1.5
Freight	2.5
FANS	
Centrifugal	1.0
Cooling Towers	1.5
Forced Draft	1.5
Induced Draft without Damper	
Control	2.0
FEEDERS	
Apron, Belt, Disc, Screw	1.25
Reciprocating	2.5

Application	Typical Service Factor
GENERATORS — (Not Welding)	1.0
HAMMER MILLS	2.0
LAUNDRY WASHERS — Reversing	2.0
LAUNDRY TUMBLERS	2.0
LINE SHAFT	1.5
LUMBER INDUSTRY	
Barkers — Drum Type	2.0
Edger Feed	2.0
Live Rolls	2.0
Log Haul — Incline	2.0
Log Haul — Well type	2.0
Off Bearing Rolls	2.0
Planer Feed Chains	1.75
Planer Floor Chains	1.75
Planer Tilting Hoist	1.75
Slab Conveyor	1.5
Sorting Table	1.5
Trimmer Feed	1.75
MARINE PROPULSION	
Main Drives	2.0
MACHINE TOOLS	
Bending Roll	2.0
Plate Planer	1.5
Punch Press — Gear Driven	2.0
Tapping Machines	2.5
Other Machine Tools	
Main Drives	1.5
Auxiliary Drives	1.25
METAL MILLS	
Draw Bench — Carriage	2.0
Draw Bench — Main Drive	2.0
Forming Machines	2.0
Slitters	1.5
Table Conveyors	
Non-Reversing	2.25
Reversing	2.5
Wire Drawing & Flattening Machine	2.0
Wire Winding Machine	1.75
METAL ROLLING MILLS (NOTE 1)	
Blooming Mills	*
Coilers, hot mill	2.0
Coilers, cold mill	1.25
Cold Mills	2.0
Cooling Beds	1.75
Door Openers	2.0
Draw Benches	2.0
Edger Drives	1.75
Feed Rolls, Reversing Mills	3.5
Furnace Pushers	2.5
Hot Mills	3.0
Ingot Cars	2.5
Kick-outs	2.5
Manipulators	3.0
Merchant Mills	3.0
Piercers	3.0
Pusher Rams	2.5
Reel Drives	1.75
Reel Drums	2.0
Reelers	3.0
Rod and Bar Mills	1.5
Roughing Mill Delivery Table	3.0
Runout Tables	
Reversing	3.0
Non-Reversing	2.0
Saws, hot & cold	2.5
Screwdown Drives	3.0
Skelp Mills	3.0
Slitters	3.0
Slabbing Mills	3.0
Soaking Pit Cover Drives	3.0
Straighteners	2.5
Tables, transfer & runout	2.0
Thrust Block	3.0
Traction Drive	3.0
Tube Conveyor Rolls	2.5
Unscramblers	2.5
Wire Drawing	1.5
MILLS, ROTARY TYPE	
Ball	2.25
Dryers & Coolers	2.0
Hammer	1.75
Kilns	2.0

Application	Typical Service Factor
Pebble & Rod	2.0
Pug	1.75
Tumbling Barrels	2.0
MIXERS	
Concrete Mixers	1.75
Drum Type	1.5
OIL INDUSTRY	
Chillers	1.25
Paraffin Filter Press	1.75
PAPER MILLS	
Barker Auxiliaries, Hydraulic	2.0
Barker, Mechanical	2.0
Barking Drum Spur Gear Only	2.25
Beater & Pulper	1.75
Bleacher	1.0
Calenders	2.0
Chippers	2.5
Coaters	1.0
Converting Machines, except Cutters, Platers	1.5
Couch Roll	1.75
Cutters, Platers	2.0
Cylinders	1.75
Disc Refiners	1.75
Dryers	1.75
Felt Stretcher	1.25
Felt Whipper	2.0
Jordans	1.75
Line Shaft	1.5
Log Haul	2.0
Pulp Grinder	1.75
Press Roll	2.0
Reel	1.5
Stock Chests	1.5
Suction Roll	1.75
Washers & Thickeners	1.5
Winders	1.5
PRINTING PRESSES	1.5
PULLERS — Barge Haul	2.0
PUMPS	
Centrifugal	1.0
Boiler Feed	1.5
Reciprocating	
Single Acting	
1 or 2 Cylinders	2.25
3 or more Cylinders	1.75
Double Acting	2.0
Rotary, Gear, Lobe, Vane	1.5
RUBBER INDUSTRY	
Mixer — Banbury	2.5
Rubber Calendar	2.0
Rubber Mill (2 or more)	2.25
Sheeter	2.0
Tire Building Machines	2.5
Tire & Tube Press Openers	1.0
Tubers & Strainers	2.0
SCREENS	
Air Washing	1.0
Grizzly	2.0
Rotary — Stone or Gravel	1.5
Traveling Water Intake	1.25
Vibrating	2.5
SEWAGE DISPOSAL EQUIPMENT	
Bar Screens	1.25
Chemical Feeders	1.25
Collectors, Circuline or Straightline	1.25
Dewatering Screens	1.25
Grit Collectors	1.25
Scum Breakers	1.25
Slow or Rapid Mixers	1.25
Sludge Collectors	1.25
Thickeners	1.25
Vacuum Filters	1.25
STEERING GEAR	1.0
STOKERS	1.0
WINCH	1.5
WINDLASS	1.75

* Refer to KOP-FLEX

NOTES

- (1) Maximum Torque at the coupling must not exceed Rated Torque of the coupling.
- (2) Check local and industrial safety codes.

1. **Select Coupling Based on Bore Capacity.**
Select the coupling size that has a maximum bore capacity equal to or larger than the larger of the two shafts. For interference fits larger than AGMA standards, consult KOP-FLEX.
2. **Verify Coupling Size Based on Load Rating.**
 - a. Select appropriate Service Factor from the Table on page 72.
 - b. Calculate required HP / 100 RPM:

$$\frac{\text{HP} \times \text{Service Factor} \times 100}{\text{RPM}} = \text{HP} / 100 \text{ RPM}$$
 - c. Verify that the selected coupling has a rating greater than or equal to the required HP / 100 RPM.

3. **Check Balance Requirements.**
Consult Dynamic Balancing Guide to help determine if balancing is required. Verify that the maximum operating speed does not exceed the maximum speed rating of the coupling. The maximum speed rating does not consider lateral critical speed considerations for floating shaft applications.

Note: Care must be exercised on proper selection of any shaft coupling. The Users must assure themselves that the design of the shaft to coupling hub connection is adequate for the duty intended.

Dynamic Balancing Guide

Balancing requirements for a coupling are dependent on factors determined by the characteristics of the connected equipment. For this reason, the Balancing Charts should be used as a GUIDE ONLY to assist in determining whether or not balancing is required.

The Balancing Charts shown are based on AGMA 9000-C90 suggested balance classes for systems with "Average" sensitivity to unbalance. For systems with higher sensitivity to unbalance, balancing of the coupling may be required at lower speeds. For systems which are less sensitive to unbalance, couplings may be able to operate at higher speeds than those shown at lower balance levels. Therefore, in the absence of either a thorough system analysis or past user experience with a similar installation, these charts should be used as a GUIDE ONLY.

FAST'S® and **Series H** gear couplings may be component balanced, or assembly balanced with fitted components (Type FB and Type HB, respectively).

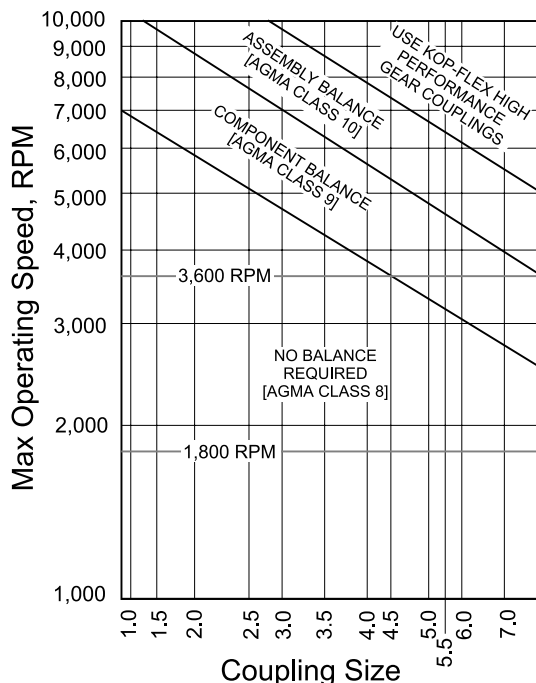
WALDRON® gear couplings are available component balanced only.

Model B gear couplings are not designed to be balanced.

These charts apply to sizes 1 through 7 only. Dynamic balance of size 8 through 30 must be considered on a case-by-case basis. Consult KOP-FLEX for assistance.

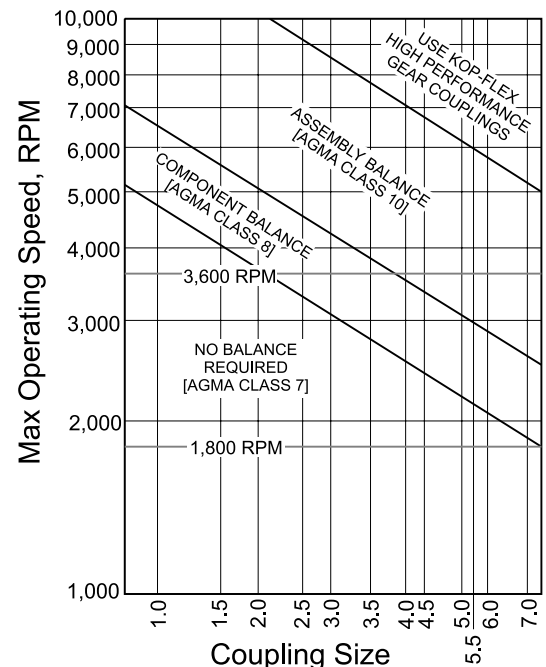
Close Coupled Balancing Chart

Based on AGMA 9000-C90 for Average System Sensitivity



Spacer Coupling Balancing Chart for 12" Shaft Separation

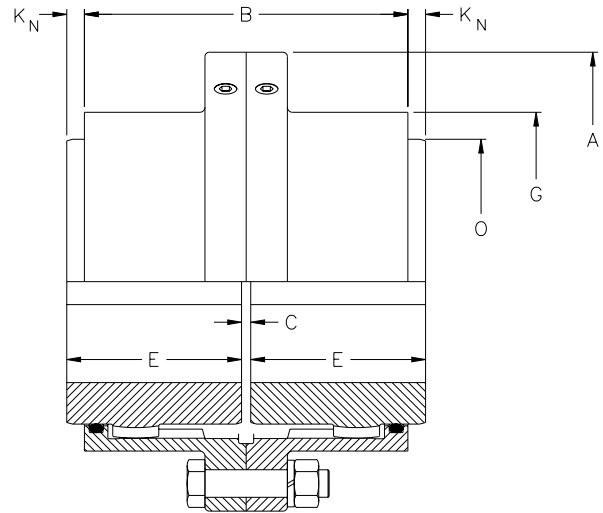
Based on AGMA 9000-C90 for Average System Sensitivity



A conventional 4-bearing system has two bearings on the driving shaft and two bearings on the driven shaft. Both angular and offset shaft misalignment will be present to some degree and a full flex coupling is mandatory. The full flex coupling is the standard coupling having two gear ring sets, one set per half coupling. For selection procedure see page 73.

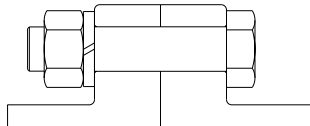
KOP-FLEX Coupling Greases

KOP-FLEX offers greases specifically designed for use in coupling applications. To ensure proper lubrication and long service life, use KOP-FLEX KSG Standard Coupling Grease, or KHP High Performance Coupling Grease. See page 101 for detailed specifications.

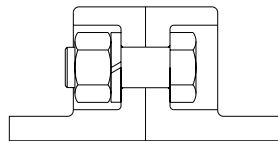


Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions									
							A	B	C	C _I	C _W	E	G	K _N	K _R	O
1	1 5/8	12	7500	15000	14500	10	4 9/16	3 1/16	1/8	3/16	1/4	1 11/16	3 1/16	7/32	9/32	2 3/8
1 1/2	2 1/4	27	17000	34000	12000	18	6	3 9/16	1/8	5/16	1/2	1 15/16	3 15/16	7/32	13/32	3 1/8
2	2 3/4	50	31500	63000	9300	33	7	4 11/16	1/8	9/16	1	2 7/16	4 15/16	5/32	19/32	4
2 1/2	3 1/2	90	56700	113400	7900	57	8 3/8	5 3/8	3/16	15/32	3/4	3 1/32	5 7/8	7/16	23/32	4 7/8
3	4	160	101000	202000	6800	85	9 7/16	6 9/16	3/16	29/32	1 5/8	3 19/32	6 7/8	13/32	1 1/8	5 5/8
3 1/2	4 1/2	235	148000	296000	6000	130	11	7 11/16	1/4	1 1/16	1 7/8	4 3/16	7 29/32	15/32	1 9/32	6 1/2
4	5 1/2	375	236000	472000	5260	192	12 1/2	8 3/4	1/4	1 1/4	2 1/4	4 3/4	9 1/4	1/2	1 1/2	7 3/4
4 1/2	6	505	318000	636000	4770	261	13 5/8	9 11/16	5/16	1 7/16	2 9/16	5 5/16	10 3/8	5/8	1 3/4	8 1/2
5	6 7/8	700	441000	882000	4300	376	15 5/16	11 1/16	5/16	1 31/32	3 5/8	6 1/32	11 9/16	21/32	2 5/16	9 1/2
5 1/2*	7 3/4	920	580000	1160000	3880	474	16 3/4	12 7/16	5/16	2 3/32	3 7/8	6 29/32	12 11/16	27/32	2 5/8	10 1/2
6*	8 5/8	1205	759000	1518000	3600	604	18	13 5/16	5/16	2 11/32	4 3/8	7 13/32	13 7/8	29/32	2 15/16	11 1/2
7*	10 3/8	1840	1160000	2320000	3000	902	20 3/4	15 3/8	3/8	2 13/16	5 1/4	8 11/16	16 1/16	1 3/16	3 5/8	13 1/2

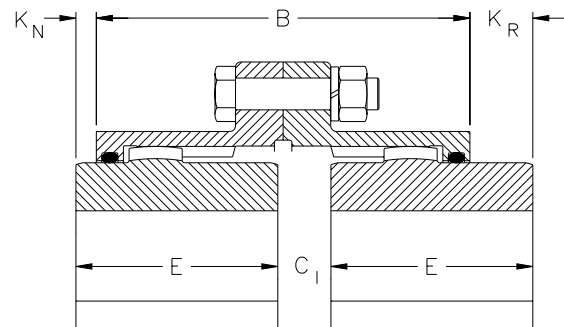
* Sizes 5 1/2, 6 and 7 are only available with exposed bolt sleeves. Type EB exposed bolt sleeves are standard.



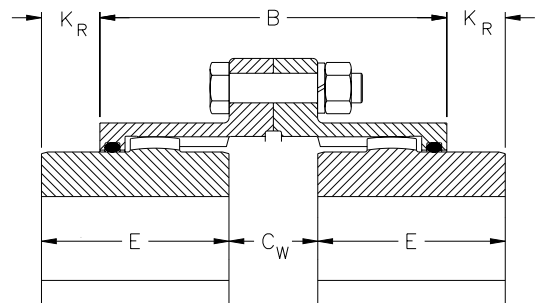
TYPE EB -
EXPOSED BOLTS



TYPE SB -
SHROUDED BOLTS



ONE HUB REVERSED



TWO HUBS REVERSED

Fastener Data

Coupling Size	Type EB Exposed Bolt			Type SB Shrouded Bolt		
	Qty.	Size & Length	Bolt Circle	Qty.	Size & Length	Bolt Circle
1	6	1/4 x 1 1/2	3 3/4	6	1/4 x 7/8	3 3/4
1 1/2	8	3/8 x 2	4 13/16	8	3/8 x 1	4 13/16
2	6	1/2 x 2 1/4	5 7/8	10	3/8 x 1	5 13/16
2 1/2	6	5/8 x 2 3/4	7 1/8	10	1/2 x 1 5/16	7
3	8	5/8 x 2 3/4	8 1/8	12	1/2 x 1 5/16	8
3 1/2	8	3/4 x 3 3/8	9 1/2	12	5/8 x 1 5/8	9 9/32
4	8	3/4 x 3 3/8	11	14	5/8 x 1 5/8	10 5/8
4 1/2	10	3/4 x 3 3/8	12	14	5/8 x 1 5/8	11 3/4
5	8	7/8 x 4 1/4	13 1/2	14	3/4 x 2 1/8	13 3/16
5 1/2*	14	7/8 x 3 1/4	14 1/2	-	-	-
6*	14	7/8 x 3 1/4	15 3/4	-	-	-
7*	16	1 x 3 5/8	18 1/4	-	-	-

Sizes #5 1/2 and larger are available in exposed bolts only.

Full Flex Coupling Size 8-30

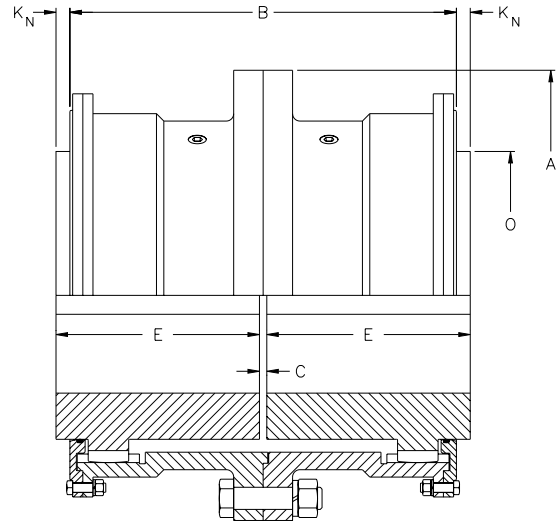
Series H coupling sizes 8-30 feature an all-metal end ring which can be easily removed to inspect the hub and sleeve teeth without removing the hub from its shaft.

All end rings have gaskets and are bolted to the sleeves. Non-critical surfaces are as-cast, or as-forged. Sleeves have mating male and female rabbets at the center and end flange joints to simplify installation. The sleeves have two lube plugs in the body.

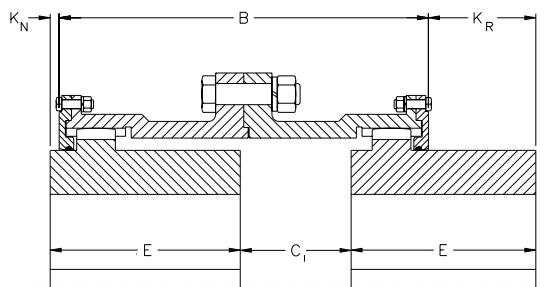
Standardized center flanges allow flex-half substitution regardless of design or vintage. All bolts are special with respect to body length, thread length, and bolt body tolerance.

Sizes 8 - 30 are available with exposed bolts only.

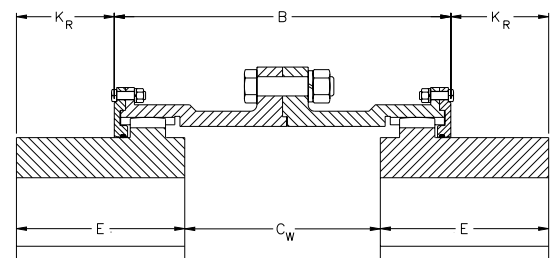
For alloy steel couplings, see page 86.



Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in. x 1000)	Peak Torque Rating (lb.-in. x 1000)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions						
							A	B	C	C ₁	C _W	E	O
8	10 3/4	2230	1404	2808	1750	1430	23 1/4	19 1/2	3/8	5 9/16	10 3/4	9 13/16	14
9	11 3/4	3170	1995	3990	1625	2000	26	21 3/4	1/2	6 1/4	12	10 7/8	15 1/2
10	13	4350	2744	5488	1500	2670	28	24	1/2	7 1/8	13 3/4	12	17 1/2
11	15	5780	3645	7290	1375	3520	30 1/2	26 1/4	1/2	7 7/8	15 1/4	13 1/8	19 1/2
12	16 1/4	7190	4532	9064	1250	4450	33	27 3/4	1/2	8 1/8	15 3/4	13 7/8	21 1/2
13	17 1/2	9030	5688	11376	1125	5410	35 3/4	29 1/2	3/4	8 7/16	16 1/8	14 5/8	23
14	18 3/4	11080	6982	13964	1000	6600	38	31 1/4	3/4	9	17 1/4	15 1/2	25
15	20 3/4	13470	8488	16976	875	8040	40 1/2	33 1/8	3/4	9 7/16	18 1/8	16 1/2	27
16	22	16100	10150	20300	750	9680	43	35	1	9 7/8	18 3/4	17 3/8	29
18	25 1/4	21100	13300	26600	500	12500	47 1/4	36 1/8	1	10 1/4	19 1/2	18	33
20	27 1/4	28800	18144	36288	400	17900	53 1/2	42 3/8	1	12 3/8	23 3/4	21 1/8	36 1/2
22	30	38100	24009	48018	300	23300	59	46	1	13 3/4	26 1/2	23	40
24	33 1/4	42400	26699	53398	200	30300	64 1/4	49 1/2	1	15	29	24 3/4	44 1/2
26	36 3/4	53000	33415	66830	200	37700	68 1/2	53	1	15 5/8	30 1/4	26 1/2	48 1/2
28	40	65900	41564	83128	200	45200	73 3/4	54 1/4	1	15 7/8	30 3/4	27 1/8	52 1/2
30	43 1/2	80300	50614	101228	200	52700	78	55 1/4	1	15 7/8	30 3/4	27 5/8	56 1/2



ONE HUB REVERSED



TWO HUBS REVERSED

Fastener Data

Coupling Size	Center Flange			End Ring		
	Quantity	Size & Length	Bolt Circle	Quantity (each)	Size & Length	Bolt Circle
8	16	1 1/8 x 4 1/8	20 3/4	10	1/2 x 2	19 3/8
9	18	1 1/4 x 4 1/2	23 1/4	12	5/8 x 2 3/16	21 3/4
10	18	1 3/8 x 5 3/8	25 1/4	12	5/8 x 2 3/16	23 7/8
11	18	1 1/2 x 5 7/8	27 1/2	12	5/8 x 2 3/16	26 1/16
12	18	1 1/2 x 6 1/8	30	12	3/4 x 2 9/16	28 5/16
13	18	1 5/8 x 6 3/8	32 1/4	12	3/4 x 2 9/16	30 1/2
14	18	1 3/4 x 6 5/8	34 1/2	14	3/4 x 2 9/16	32 5/8
15	20	1 3/4 x 6 5/8	36 3/4	14	7/8 x 2 7/8	35
16	20	2 x 7 3/8	39	14	7/8 x 2 7/8	37 1/8
18	22	2 x 7 3/8	43 1/4	14	7/8 x 2 7/8	41 3/8
20	22	2 1/4 x 7 5/8	48 3/4	16	1 x 3 5/8	46 1/4
22	22	2 1/2 x 8 1/8	53 1/2	16	1 x 3 5/8	50 3/4
24	22	2 3/4 x 8 7/8	58 1/4	16	1 1/8 x 4 1/8	55
26	24	2 3/4 x 8 7/8	62 1/2	18	1 1/8 x 4 1/8	59 1/4
28	22	3 x 9 5/8	67 1/4	16	1 1/4 x 4 1/4	63 11/16
30	24	3 x 9 5/8	71 1/2	18	1 1/4 x 4 1/4	68 3/16

Coupling Type EB (Exposed Bolts) Part Numbers

Coupling Size	Full Flex Coupling			Fastener Set (Includes Gasket)		Sleeve		Flex Hub		
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.	Finish Bore ^① Part No.
1	1H EB FF	10	1 H EB FF FB	1 EB FS	1	1 H EB SLEEVE	2	1H FHUB	3	1H FHUB
1 1/2	1 1/2H EB FF	19	1 1/2H EB FF FB	1 1/2 EB FS	1	1 1/2H EB SLEEVE	6	1 1/2H FHUB	3	1 1/2H FHUB FB
2	2H EB FF	30	2H EB FF FB	2 EB FS	1	2H EB SLEEVE	8	2H FHUB	7	2H FHUB FB
2 1/2	2 1/2H EB FF	52	2 1/2H EB FF FB	2 1/2 EB FS	2	2 1/2H EB SLEEVE	14	2 1/2H FHUB	12	2 1/2H FHUB FB
3	3H EB FF	76	3H EB FF FB	3 EB FS	3	3H EB SLEEVE	17	3H FHUB	20	3H FHUB FB
3 1/2	3 1/2H EB FF	117	3 1/2H EB FF FB	3 1/2 EB FS	5	3 1/2H EB SLEEVE	28	3 1/2H FHUB	28	3 1/2H FHUB FB
4	4H EB FF	180	4H EB FF FB	4 EB FS	5	4H EB SLEEVE	41	4H FHUB	47	4H FHUB FB
4 1/2	4 1/2H EB FF	244	4 1/2H EB FF FB	4 1/2 EB FS	7	4 1/2H EB SLEEVE	53	4 1/2H FHUB	66	4 1/2H FHUB FB
5	5H EB FF	361	5H EB FF FB	5 EB FS	9	5H EB SLEEVE	80	5H FHUB	96	5H FHUB FB
5 1/2	5 1/2H EB FF	422	5 1/2H EB FF FB	5 1/2 EB FS	14	5 1/2H EB SLEEVE	89	5 1/2H FHUB	115	5 1/2H FHUB
6	6H EB FF	494	6H EB FF FB	6 EB FS	14	6H EB SLEEVE	100	6H FHUB	140	6H FHUB
7	7H EB FF	822	7H EB FF FB	7 EB FS	22	7H EB SLEEVE	160	7H FHUB	240	7H FHUB

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Coupling Type SB (Shrouded Bolts) Part Numbers

Coupling Size	Full Flex Coupling			Fastener Set (Includes Gasket)		Sleeve		Flex Hub		
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.	Finish Bore ^① Part No.
1	1H SB FF	10	1H SB FF FB	1 SB FS	1	1H SB SLEEVE	2	1H FHUB	3	1H FHUB FB
1 1/2	1 1/2H SB FF	19	1 1/2H SB FF FB	1 1/2 SB FS	1	1 1/2H SB SLEEVE	6	1 1/2H FHUB	3	1 1/2H FHUB FB
2	2H SB FF	30	2H SB FF FB	2 SB FS	1	2H SB SLEEVE	8	2H FHUB	7	2H FHUB FB
2 1/2	2 1/2H SB FF	52	2 1/2H SB FF FB	2 1/2 SB FS	2	2 1/2H SB SLEEVE	13	2 1/2H FHUB	12	2 1/2H FHUB FB
3	3H SB FF	76	3H SB FF FB	3 SB FS	2	3H SB SLEEVE	15	3H FHUB	20	3H FHUB FB
3 1/2	3 1/2H SB FF	117	3 1/2H SB FF FB	3 1/2 SB FS	4	3 1/2H SB SLEEVE	26	3 1/2H FHUB	28	3 1/2H FHUB FB
4	4H SB FF	180	4H SB FF FB	4 SB FS	4	4H SB SLEEVE	37	4H FHUB	47	4H FHUB FB
4 1/2	4 1/2H SB FF	244	4 1/2H SB FF FB	4 1/2 SB FS	4	4 1/2H SB SLEEVE	50	4 1/2H FHUB	66	4 1/2H FHUB FB
5	5H SB FF	361	5H SB FF FB	5 SB FS	7	5H SB SLEEVE	72	5H FHUB	96	5H FHUB FB

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Coupling Type (Exposed Bolts) Part Numbers

Coupling Size	Full Flex	Male Half w/Access	Female Half w/Access	Hub	Male Sleeve	Female Sleeve	End Ring	Center Flange Fastener Set (includes gasket)	End Ring Fastener Set (includes gasket)
8	8H EB FF	8H EB MH	8H EB FH	8H FHUB	8H EB MSLEEVE	8H EB FSLEEVE	8H ERING	8 EB FS	8 ERFS
9	9H EB FF	9H EB MH	9H EB FH	9H FHUB	9H EB MSLEEVE	9H EB FSLEEVE	9H ERING	9 EB FS	9 ERFS
10	10H EB FF	10H EB MH	10H EB FH	10H FHUB	10H EB MSLEEVE	10H EB FSLEEVE	10H ERING	10 EB FS	10 ERFS
11	11H EB FF	11H EB MH	11H EB FH	11H FHUB	11H EB MSLEEVE	11H EB FSLEEVE	11H ERING	11 EB FS	11 ERFS
12	12H EB FF	12H EB MH	12H EB FH	12H FHUB	12H EB MSLEEVE	12H EB FSLEEVE	12H ERING	12 EB FS	12 ERFS
13	13H EB FF	13H EB MH	13H EB FH	13H FHUB	13H EB MSLEEVE	13H EB FSLEEVE	13H ERING	13 EB FS	13 ERFS
14	14H EB FF	14H EB MH	14H EB FH	14H FHUB	14H EB MSLEEVE	14H EB FSLEEVE	14H ERING	14 EB FS	14 ERFS
15	15H EB FF	15H EB MH	15H EB FH	15H FHUB	15H EB MSLEEVE	15H EB FSLEEVE	15H ERING	15 EB FS	15 ERFS
16	16H EB FF	16H EB MH	16H EB FH	16H FHUB	16H EB MSLEEVE	16H EB FSLEEVE	16H ERING	16 EB FS	16 ERFS
18	18H EB FF	18H EB MH	18H EB FH	18H FHUB	18H EB MSLEEVE	18H EB FSLEEVE	18H ERING	18 EB FS	18 ERFS
20	20H EB FF	20H EB MH	20H EB FH	20H FHUB	20H EB MSLEEVE	20H EB FSLEEVE	20H ERING	20 EB FS	20 ERFS
22	22H EB FF	22H EB MH	22H EB FH	22H FHUB	22H EB MSLEEVE	22H EB FSLEEVE	22H ERING	22 EB FS	22 ERFS
24	24H EB FF	24H EB MH	24H EB FH	24H FHUB	24H EB MSLEEVE	24H EB FSLEEVE	24H ERING	24 EB FS	24 ERFS
26	26H EB FF	26H EB MH	26H EB FH	26H FHUB	26H EB MSLEEVE	26H EB FSLEEVE	26H ERING	26 EB FS	26 ERFS
28	28H EB FF	28H EB MH	28H EB FH	28H FHUB	28H EB MSLEEVE	28H EB FSLEEVE	28H ERING	28 EB FS	28 ERFS
30	30H EB FF	30H EB MH	30H EB FH	30H FHUB	30H EB MSLEEVE	30H EB FSLEEVE	30H ERING	30 EB FS	30 ERFS

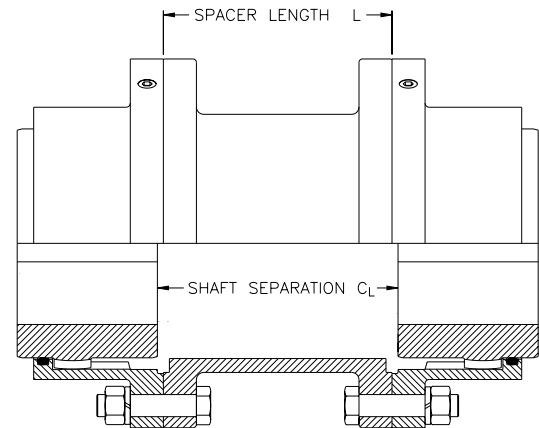
Standard Spacer Couplings

Full-flex spacer couplings are used for 4 bearing installations with extended shaft separations. Tabulated here are spacers for industry standard shaft separations, C_L .

Type EB exposed bolt spacers and Type SB shrouded bolt spacers for standard shaft separations are normally in stock. **Other lengths are manufactured to order.**

Spacer length, L , is calculated by subtracting the standard full-flex, close coupled gap, C_L , from the shaft separation, C_L .

$$L = C_L - C_L \quad (\text{full-flex, close coupled})$$



Spacer Part Numbers

Stock Spacer Part Numbers
Type SB (Shrouded Bolts)

Coupling Size	Shaft Separation							
	3 1/2"		4 3/8"		5"		7"	
	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.
1 1/2	1 1/2 SB SPR350	6	1 1/2 SB SPR438	7	1 1/2 SB SPR500	8		
2	2 SB SPR350	8	2 SB SPR438	9	2 SB SPR500	10	2 SB SPR700	12
2 1/2					2 1/2 SB SPR500	14	2 1/2 SB SPR700	17
3					3 SB SPR500	17	3 SB SPR700	20
3 1/2					3 1/2 SB SPR500	27		

Stock Spacer Part Numbers
Type EB (Exposed Bolts)

Coupling Size	Shaft Separation			
	5"		7"	
	Part No.	Wt.	Part No.	Wt.
1 1/2	1 1/2 EB SPR500	8		
2	2 EB SPR500	10	2 EB SPR700	12
2 1/2	2 1/2 EB SPR500	14		
3	3 EB SPR500	17		

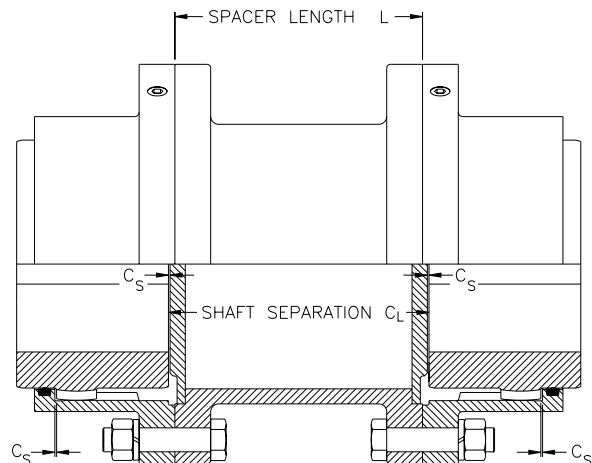
LEF Spacer Couplings

Limited End Float (LEF) spacer couplings are used for sleeve bearing motor applications with extended shaft separations. LEF spacers are supplied with steel LEF plates installed in each end.

Spacer length, L_{LEF} , is calculated by subtracting the LEF full-flex, close coupled gap, C_{LEF} , from the shaft separation, C_L .

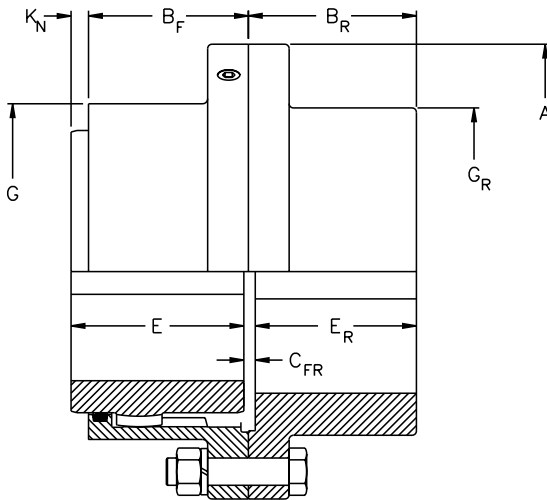
$$L_{LEF} = C_L - C_{LEF} \quad (\text{LEF full-flex, close coupled})$$

LEF spacers are shorter than standard spacers for a given shaft separation, and are manufactured to order.



Flex Rigid and Floating Shaft Couplings Size 1-7

When driving and driven shafts are widely separated, an unsupported or floating shaft is used to span the gap. The two couplings required at each end of that shaft consist of one half of a standard coupling bolted to a Rigid Hub, each unit called a Flex-Rigid Coupling. Usually, the rigid hubs are mounted on the driving and driven shafts so that the flex halves on the floating shaft may be replaced without disturbing the connected equipment.



Coupling Type EB (Exposed Bolts) Part Numbers

Coupling Size	Flex Rigid Coupling			Rigid Hub ^②		
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	No Bore Part No.	Wt.	Finish Bore ^① Part No.
1	1H EB FR	10	1H EB FR FB	1 EB RHUB	5	1 EB RHUB FB
1 1/2	1 1/2H EB FR	19	1 1/2H EB FR FB	1 1/2 EB RHUB	9	1 1/2 EB RHUB FB
2	2H EB FR	31	2H EB FR FB	2 EB RHUB	15	2 EB RHUB FB
2 1/2	2 1/2H EB FR	55	2 1/2H EB FR FB	2 1/2 EB RHUB	27	2 1/2 EB RHUB FB
3	3H EB FR	83	3H EB FR FB	3 EB RHUB	40	3 EB RHUB FB
3 1/2	3 1/2H EB FR	126	3 1/2H EB FR FB	3 1/2 EB RHUB	65	3 1/2 EB RHUB FB
4	4H EB FR	184	4H EB FR FB	4 EB RHUB	90	4 EB RHUB FB
4 1/2	4 1/2H EB FR	252	4 1/2H EB FR FB	4 1/2 EB RHUB	124	4 1/2 EB RHUB FB
5	5H EB FR	371	5H EB FR FB	5 EB RHUB	119	5 EB RHUB FB
5 1/2	5 1/2H EB FR	418	5 1/2H EB FR FB	5 1/2 EB RHUB	200	5 1/2 EB RHUB FB
6	6H EB FR	504	6H EB FR FB	6 EB RHUB	250	6 EB RHUB FB
7	7H EB FR	792	7H EB FR FB	7 EB RHUB	370	7 EB RHUB FB

Coupling Type SB (Shrouded Bolts) Part Numbers

Coupling Size	Flex Rigid Coupling			Rigid Hub ^②		
	No Bore Part No.	Wt.	Finish Bore ^① Part No.	No Bore Part No.	Wt.	Finish Bore ^① Part No.
1	1H SB FR	10	1H SB FR FB	1 SB RHUB	5	1 SB RHUB FB
1 1/2	1 1/2H SB FR	19	1 1/2H SB FR FB	1 1/2 SB RHUB	9	1 1/2 SB RHUB FB
2	2H SB FR	31	2H SB FR FB	2 SB RHUB	15	2 SB RHUB FB
2 1/2	2 1/2H SB FR	55	2 1/2H SB FR FB	2 1/2 SB RHUB	27	2 1/2 SB RHUB FB
3	3H SB FR	83	3H SB FR FB	3 SB RHUB	40	3 SB RHUB FB
3 1/2	3 1/2H SB FR	126	3 1/2H SB FR FB	3 1/2 SB RHUB	65	3 1/2 SB RHUB FB
4	4H SB FR	184	4H SB FR FB	4 SB RHUB	90	4 SB RHUB FB
4 1/2	4 1/2H SB FR	252	4 1/2H SB FR FB	4 1/2 SB RHUB	124	4 1/2 SB RHUB FB
5	5H SB FR	371	5H SB FR FB	5 SB RHUB	119	5 SB RHUB FB

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances.

② Rigid hubs are furnished less fasteners.

Flex-Rigid Coupling Data

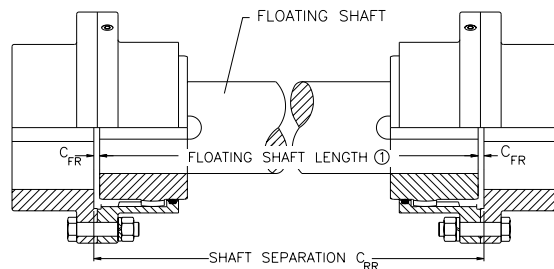
Coupling Size	Maximum Bore with Standard Keyway		Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM) ^②	Dimensions						
	Flex	Rigid					A	B _F	B _R	C _{FR} ^①	E	E _R	G _R
1	1 5/8	2 1/4	12	7500	15000	14500	4 9/16	1 17/32	1 21/32	5/32	1 11/16	1 9/16	3
1 1/2	2 1/4	2 11/16	27	17000	34000	12000	6	1 25/32	1 15/16	5/32	1 15/16	1 27/32	3 13/16
2	2 3/4	3 3/8	50	31500	63000	9300	7	2 11/32	2 3/8	5/32	2 7/16	2 9/32	4 13/16
2 1/2	3 1/2	4	90	56700	113400	7900	8 3/8	2 11/16	3	3/16	3 1/32	2 29/32	5 3/4
3	4	4 3/4	160	101000	202000	6800	9 7/16	3 9/32	3 9/16	3/16	3 19/32	3 15/32	6 3/4
3 1/2	4 1/2	5 1/2	235	148000	296000	6000	11	3 27/32	4 1/8	7/32	4 3/16	4 1/32	7 3/4
4	5 1/2	6 3/8	375	236000	472000	5260	12 1/2	4 3/8	4 5/8	5/16	4 3/4	4 7/16	9
4 1/2	6	7 1/4	505	318000	636000	4770	13 5/8	4 27/32	5 1/4	11/32	5 5/16	5 1/16	10 1/8
5	6 7/8	8 1/2	700	441000	882000	4300	15 5/16	5 17/32	5 7/8	11/32	6 1/32	5 11/16	11 3/8
5 1/2*	7 3/4	8	920	580000	1160000	3880	16 3/4	6 7/32	7 5/32	11/32	6 29/32	6 31/32	10 3/4
6*	8 5/8	8 3/4	1205	759000	1518000	3600	18	6 21/32	7 21/32	11/32	7 13/32	7 15/32	11 1/2
7*	10 3/8	10	1840	1160000	2320000	3000	20 3/4	7 11/16	9	7/16	8 11/16	8 3/4	13 3/8

* Sizes 5 1/2, 6 and 7 are only available with exposed bolts. Type EB exposed bolts are standard.

① Floating shaft length is equal to the shaft separation minus 2 times the C_{FR} dimension.

② Max. speed is based on flange stress limits and does not consider lateral critical speed considerations for floating shaft applications.

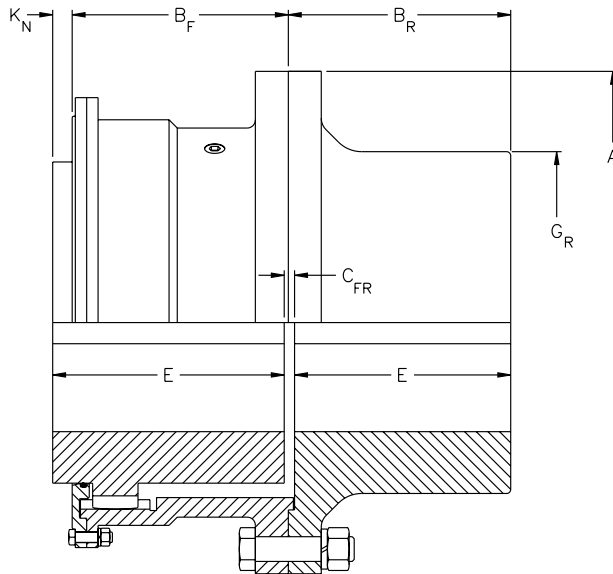
FLOATING SHAFT ASSEMBLY



Ordering Instructions: When ordering floating shaft couplings, be sure to include hp and rpm, shaft separation, and equipment shaft sizes. Applications with very large shaft separations and/or high speeds may require tubular floating shafts due to lateral critical speed concerns.

Important: Care must be exercised in proper selection of any shaft coupling. The Users must assure themselves that the design of the shaft to coupling hub connection is adequate for the duty intended.

Flex Rigid and Floating Shaft Couplings Size 8 - 30



**Coupling Type EB
(Exposed Bolts) Part Numbers**

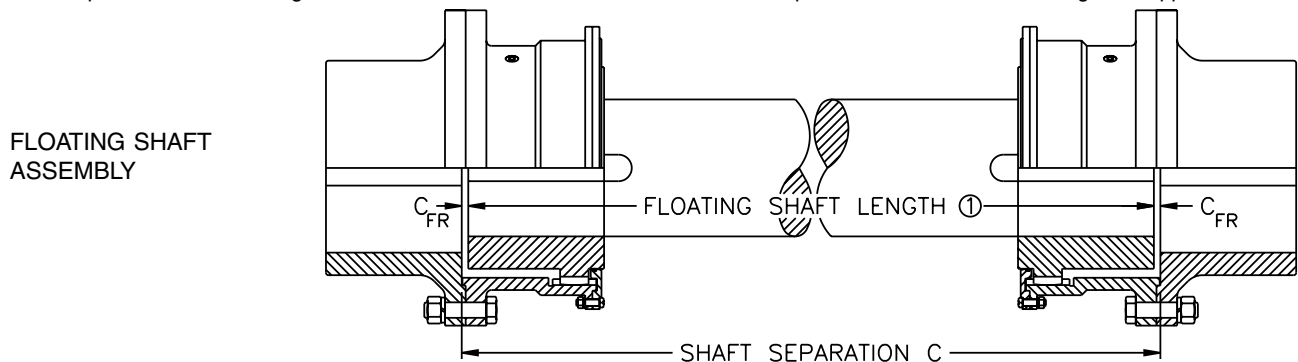
Coupling Size	Flex Rigid w/Access	Male Rigid	Female Rigid
8	8H EB FR	8H EB MRHUB	8H EB FRHUB
9	9H EB FR	9H EB MRHUB	9H EB FRHUB
10	10H EB FR	10H EB MRHUB	10H EB FRHUB
11	11H EB FR	11H EB MRHUB	11H EB FRHUB
12	12H EB FR	12H EB MRHUB	12H EB FRHUB
13	13H EB FR	13H EB MRHUB	13H EB FRHUB
14	14H EB FR	14H EB MRHUB	14H EB FRHUB
15	15H EB FR	15H EB MRHUB	15H EB FRHUB
16	16H EB FR	16H EB MRHUB	16H EB FRHUB
18	18H EB FR	18H EB MRHUB	18H EB FRHUB
20	20H EB FR	20H EB MRHUB	20H EB FRHUB
22	22H EB FR	22H EB MRHUB	22H EB FRHUB
24	24H EB FR	24H EB MRHUB	24H EB FRHUB
26	26H EB FR	26H EB MRHUB	26H EB FRHUB
28	28H EB FR	28H EB MRHUB	28H EB FRHUB
30	30H EB FR	30H EB MRHUB	30H EB FRHUB

Coupling Size	Maximum Bore with Standard Key		Rating HP / 100 RPM	Torque Rating (lb.-in. x 1000)	Peak Torque Rating (lb.-in. x 1000)	Maximum Speed (RPM) ②	Weight with Solid Hubs (lb.)	Dimensions					
	Flex	Rigid						A	B _F	B _R	C _{FR} ①	E	G _R
8	10 3/4	11	2230	1404	2808	1750	1470	23 1/4	9 3/4	10 1/8	1/2	9 13/16	15 1/4
9	11 3/4	12 3/4	3170	1995	3990	1625	1960	26	10 7/8	11 13/16	9/16	10 7/8	17 1/4
10	13	13 1/2	4350	2744	5488	1500	2720	28	12	12 3/8	5/8	12	19
11	15	15	5780	3645	7290	1375	3520	30 1/2	13 1/8	13 1/2	5/8	13 1/8	20 3/4
12	16 1/4	16 1/4	7190	4532	9064	1250	4450	33	13 7/8	14 1/4	5/8	13 7/8	22 5/8
13	17 1/2	18	9030	5688	11376	1125	5480	35 3/4	14 3/4	15	3/4	14 5/8	24 5/8
14	18 3/4	19	11080	6982	13964	1000	6560	38	15 5/8	15 7/8	3/4	15 1/2	26 1/4
15	20 3/4	20 1/2	13470	8488	16976	875	7920	40 1/2	16 9/16	16 7/8	3/4	16 1/2	28
16	22	22	16100	10150	20300	750	9560	43	17 1/2	17 7/8	1	17 3/8	29 3/4
18	25 1/4	25	21100	13300	26600	500	12400	47 1/4	18 1/16	18 1/2	1	18	34
20	27 1/4	26	28800	18144	36288	400	16500	53 1/2	21 3/16	21 5/8	1	21 1/8	36
22	30	27	38100	24009	48018	300	21000	59	23	23 5/8	1 1/8	23	38
24	33 1/4	28	42400	26699	53398	200	26300	64 1/4	24 3/4	25 3/8	1 1/8	24 3/4	40
26	36 3/4	29	53000	33415	66830	200	32000	68 1/2	26 1/2	27 1/8	1 1/8	26 1/2	42
28	40	30	65900	41564	83128	200	37700	73 3/4	27 1/8	27 3/4	1 1/8	27 1/8	44
30	43 1/2	36	80300	50614	101228	200	43400	78	27 5/8	28 1/4	1 1/8	27 5/8	50

NOTE: Couplings are only available with exposed bolts.

① Floating shaft length is equal to the shaft separation, minus 2 times the C_{FR} dimension.

② Max. speed is based on flange stress limits and does not consider lateral critical speed considerations for floating shaft applications.

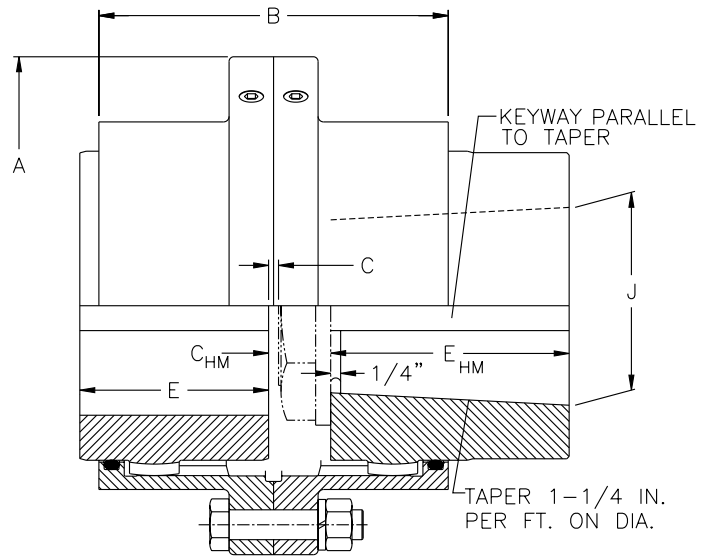


Ordering Instructions: When ordering floating shaft couplings, be sure to include hp and rpm, shaft separation, and equipment shaft sizes. Applications with very large shaft separations and/or high speeds may require tubular floating shafts due to lateral critical speed concerns.

Important: Care must be exercised in proper selection of any shaft coupling. The Users must assure themselves that the design of the shaft to coupling hub connection is adequate for the duty intended.

The Series H Mill Motor Coupling is designed for use on AISE and other mill motors having tapered shafts with locknuts, and are used primarily in the metals industry. This design is also commonly used on other types of equipment which use tapered shafts with locknuts, such as turbines, pumps, and compressors.

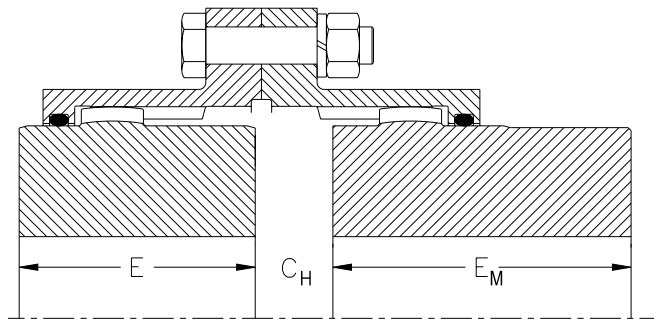
The standard "composite" mill motor hub is a semi-finished hub which can be modified and bored to fit a variety of AISE mill motor frames. Note that one size of coupling will fit several motor frames; conversely, several sizes may fit a single motor frame. See page 73 for proper coupling selection.



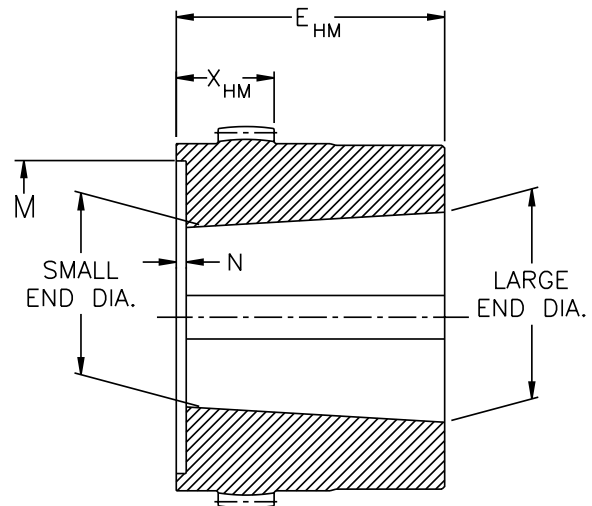
Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions		
							A	B	E
1 1/2	2 1/4	27	17000	34000	12000	22.9	6	3 9/16	1 15/16
2	2 3/4	50	31500	63000	9300	38.9	7	4 11/16	2 7/16
2 1/2	3 1/2	90	56700	113400	7900	70	8 3/8	5 3/8	3 1/32
3	4	160	101000	202000	6800	100	9 7/16	6 9/16	3 19/32
3 1/2	4 1/2	235	148000	296000	6000	155	11	7 11/16	4 3/16
4	5 1/2	375	236000	472000	5260	219	12 1/2	8 3/4	4 3/4
4 1/2	6	505	318000	636000	4770	298	13 5/8	9 11/16	5 5/16
5	6 7/8	700	441000	882000	4300	433	15 5/16	11 1/16	6 1/32
5 1/2*	7 3/4	920	580000	1160000	3880	610	16 3/4	12 7/16	6 29/32
6*	8 5/8	1205	759000	1518000	3600	718	18	13 5/16	7 13/32

See next page for additional dimensions.

* Sizes 5 1/2 and 6 are only available with exposed bolts. Type EB exposed bolts are standard.



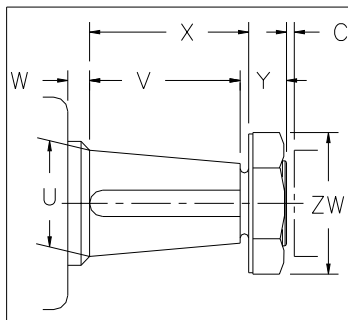
MILL MOTOR COMPOSITE HUB
ROUGH BORED



MILL MOTOR COMPOSITE HUB
FINISH BORED

Type MM Coupling Size	For: AISE Mill Motor Frame Sizes	Rough Bored Composite Hub Dimensions & Part Numbers					Finish Bored Composite Hub For AISE Mill Motors Dimensions & Part Numbers									
		Dimensions			Part Number		Dimensions						Bore Dia.		Keyway	Part Number
		C _H	E _M	X _M			C	C _{HM}	E _{HM}	X _{HM}	M	N	Large End	Small End		
1 1/2	802	3/4	3 7/8	23/32	1 1/2H MMHUB	1/8	3/4	3 5/16	23/32	2 5/8	5/16					1 1/2H MMHUB02
2	602															
2	AC1	1 1/16	4 3/16	27/32	2H MMHUB	1/8	1 1/16	3	27/32	—	—	—	1.749	1.4365	1/2 x 1/4	2H MMHUB02
2 1/2	AC2															
2 1/2	AC4	1 1/8	5 9/16	1 1/8	2 1/2H MMHUB	3/16	1 1/8	3	1 1/8	—	—	—				2 1/2H MMHUB02
1 1/2	803	3/4	3 7/8	23/32	1 1/2H MMHUB	1/8	3/4	3 7/8	23/32	2 5/8	3/8					1 1/2H MMHUB0304
2	804	1 1/16	4 3/16	27/32	2H MMHUB	1/8	1 1/16	3 9/16	27/32	2 5/8	1/16		1.999	1.6344	1/2 x 1/4	2H MMHUB0304
2 1/2	603	1 1/8	5 9/16	1 1/8	2 1/2H MMHUB	3/16	1 3/16	3 1/2	1 1/16	—	—	—				2 1/2H MMHUB0304
3	604	1 3/16	5 5/8	1 5/8	3H MMHUB	3/16	1 3/16	3 1/2	1 5/8	—	—	—				3H MMHUB0304
2	806	1 1/16	4 3/16	27/32	2H MMHUB	1/8	1 1/16	4 3/16	27/32	3 1/8	3/16					2 H MMHUB06
2 1/2	606	1 1/8	5 9/16	1 1/8	2 1/2H MMHUB	3/16	1 5/16	4	15/16	—	—	—	2.499	2.0823	1/2 x 1/4	2 1/2H MMHUB06
3	AC8	1 3/16	5 5/8	1 5/8	3H MMHUB	3/16	1 5/16	4	1 1/2	—	—	—				3H MMHUB06
3 1/2	AC12	1 3/8	6 1/8	1 29/32	3 1/2H MMHUB	1/4	1 3/8	4	1 29/32	—	—	—				3 1/2H MMHUB06
2 1/2	808	1 1/8	5 9/16	1 1/8	2 1/2H MMHUB	3/16	1 9/32	4 21/32	31/32	3 3/4	5/32					2 1/2H MMHUB08
3	608	1 3/16	5 5/8	1 5/8	3H MMHUB	3/16	1 7/16	4 1/2	1 3/8	—	—	—	2.9985	2.5298	3/4 x 1/4	3H MMHUB08
3 1/2		1 3/8	6 1/8	1 29/32	3 1/2H MMHUB	1/4	1 1/2	4 1/2	1 25/32	—	—	—				3 1/2H MMHUB08
2 1/2	810	1 1/8	5 9/16	1 1/8	2 1/2H MMHUB	3/16	1 9/32	4 25/32	31/32	4	9/32					2 1/2H MMHUB10
3	610	1 3/16	5 5/8	1 5/8	3H MMHUB	3/16	1 9/16	4 1/2	1 1/4	—	—	—	3.2485	2.7798	3/4 x 1/4	3H MMHUB10
3 1/2	AC18	1 3/8	6 1/8	1 29/32	3 1/2H MMHUB	1/4	1 5/8	4 1/2	1 21/32	—	—	—				3 1/2H MMHUB10
4		1 9/16	6	2 3/16	4H MMHUB	1/4	1 5/8	4 1/2	2 1/8	—	—	—				4H MMHUB10
2 1/2	812	1 1/8	5 9/16	1 1/8	2 1/2H MMHUB	3/16	1 9/32	5 13/32	31/32	4 1/4	13/32					2 1/2H MMHUB12
3	612	1 3/16	5 5/8	1 5/8	3H MMHUB	3/16	1 11/16	5	1 1/8	—	—	—				3H MMHUB12
3 1/2	AC25	1 3/8	6 1/8	1 29/32	3 1/2H MMHUB	1/4	1 3/4	5	1 17/32	—	—	—	3.623	3.1022	3/4 x 1/4	3 1/2H MMHUB12
4	AC30	1 9/16	6	2 3/16	4H MMHUB	1/4	1 3/4	5	2	—	—	—				4H MMHUB12
4 1/2		1 5/8	7 3/16	2 19/32	4 1/2H MMHUB	5/16	1 13/16	5	2 13/32	—	—	—				4 1/2H MMHUB12
3	814	1 3/16	5 5/8	3 9/32	3H MMHUB	3/16	1 11/16	5 1/4	1 1/8	5 1/4	1/8					3H MMHUB14
3 1/2	614	1 3/8	6 1/8	1 29/32	3 1/2H MMHUB	1/4	1 7/8	5	1 13/32	—	—	—				3 1/2H MMHUB14
4	AC40	1 9/16	6	2 3/16	4H MMHUB	1/4	1 7/8	5	1 7/8	—	—	—	4.248	3.7272	1 x 3/8	4H MMHUB14
4 1/2	AC50	1 5/8	7 3/16	2 19/32	4 1/2H MMHUB	5/16	1 15/16	5	2 9/32	—	—	—				4 1/2H MMHUB14
5		1 5/8	8 5/16	3 9/32	5H MMHUB	5/16	1 15/16	5	2 31/32	—	—	—				5H MMHUB14
3 1/2	816	1 3/8	6 1/8	1 29/32	3 1/2H MMHUB	1/4	2	5 1/2	1 9/32	—	—	—				3 1/2H MMHUB16
4	616	1 9/16	6	2 3/16	4H MMHUB	1/4	2	5 1/2	1 3/4	—	—	—				4H MMHUB16
4 1/2		1 5/8	7 3/16	2 19/32	4 1/2H MMHUB	5/16	2 1/16	5 1/2	2 5/32	—	—	—	4.6225	4.0496	1 1/4 x 3/8	4 1/2H MMHUB16
5		1 5/8	8 5/16	3 9/32	5H MMHUB	5/16	2 1/16	5 1/2	2 27/32	—	—	—				5H MMHUB16
5 1/2		1 5/8	10 5/16	3 7/8	5 1/2H MMHUB	5/16	2 1/16	5 1/2	3 7/16	—	—	—				5 1/2H MMHUB16
6		1 5/8	10 5/16	4 5/16	6H MMHUB	5/16	2 1/16	5 1/2	3 7/8	—	—	—				6H MMHUB16
4	818	1 9/16	6	2 3/16	4H MMHUB	1/4	1 9/16	6	2 3/16	—	—	—				4H MMHUB18
4 1/2	618	1 5/8	7 3/16	2 19/32	4 1/2H MMHUB	5/16	1 5/8	6	2 19/32	—	—	—	4.9975	4.3725	1 1/4 x 1/2	4 1/2H MMHUB18
5		1 5/8	8 5/16	3 9/32	5H MMHUB	5/16	1 5/8	6	3 9/32	—	—	—				5H MMHUB18
5 1/2		1 5/8	10 5/16	3 7/8	5 1/2H MMHUB	5/16	1 5/8	6	3 7/8	—	—	—				5 1/2H MMHUB18
6		1 5/8	10 5/16	4 5/16	6H MMHUB	5/16	1 5/8	6	4 5/16	—	—	—				6H MMHUB18
4 1/2	620	1 5/8	7 3/16	2 19/32	4 1/2H MMHUB	5/16	2 1/16	6 3/4	2 5/32	—	—	—	5.872	5.1689	1 1/2 x 3/4	4 1/2H MMHUB20
5		1 5/8	8 5/16	3 9/32	5H MMHUB	5/16	2 1/16	6 3/4	2 27/32	—	—	—				5H MMHUB20
5 1/2		1 5/8	10 5/16	3 7/8	5 1/2H MMHUB	5/16	2 1/16	6 3/4	3 7/16	—	—	—				5 1/2H MMHUB20
6		1 5/8	10 5/16	4 5/16	6H MMHUB	5/16	2 1/16	6 3/4	3 7/8	—	—	—				6H MMHUB20
5	622	1 5/8	8 5/16	3 9/32	5H MMHUB	5/16	2 11/16	7 1/4	2 7/32	—	—	—	6.247	5.4918	1 1/2 x 3/4	5H MMHUB22
5 1/2		1 5/8	10 5/16	3 7/8	5 1/2H MMHUB	5/16	2 11/16	7 1/4	2 13/16	—	—	—				5 1/2H MMHUB22
6		1 5/8	10 5/16	4 5/16	6H MMHUB	5/16	2 11/16	7 1/4	3 1/4	—	—	—				6H MMHUB22
5 1/2	624	1 5/8	10 5/16	3 7/8	5 1/2H MMHUB	5/16	2 11/16	9 1/4	2 13/16	—	—	—	6.9965	6.0330	1 1/2 X 3/4	5 1/2H MMHUB24
6		1 5/8	10 5/16	4 5/16	6H MMHUB	5/16	2 11/16	9 1/4	3 1/4	—	—	—				6H MMHUB24

*ALL KEYWAYS SHOWN ARE PARALLEL TO THE TAPER. TAPER IS 1 1/4 INCH PER FOOT ON DIAMETER.



TAPERED BORES For Tapered Shafts, with or without locknut.

Determine applicable AISE Mill Motor frame or provide data below:

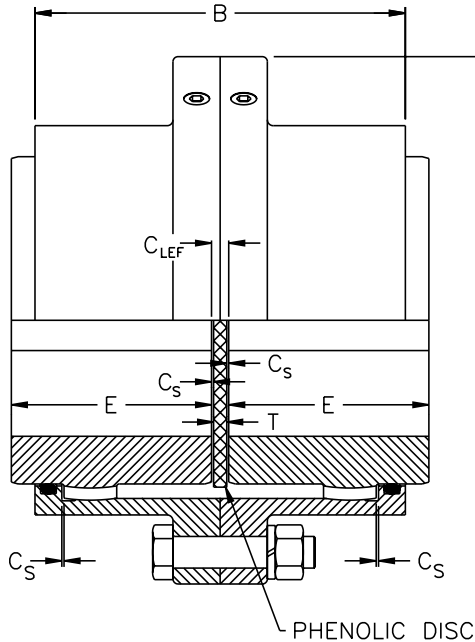
1. U Major diameter.
2. V Length of tapered portion of shaft.
3. X Length to face of lockwasher.
4. Y Length of threaded projection.
5. ZW Locknut diameter across corners.
6. W Clearance to bearing housing.
7. Taper (inches on diameter per foot of length).
8. Keyway width and depth.
9. Whether keyway is parallel to shaft or to taper.
10. C Shaft separation if machines are in place.

Limited End Float Coupling Size 1-7

For sleeve bearing motor applications, a Series H standard full flex coupling is supplied with an LEF disc to limit the axial float of the motor rotor, and protect the motor bearings at start-up and shut-down. The hub separation, C_{LEF} , is larger than for a standard full flex, and the phenolic LEF disc is placed between the hubs at assembly, limiting the float of the motor rotor to the total LEF value shown.

The equipment should be installed with the proper hub separation, C_{LEF} , when the motor rotor is located on magnetic center.

The LEF disc part numbers are listed below. See page 76 for the standard full flex part numbers.



Coupling Size	Total LEF (in.)	Dimensions						LEF Disc①	
		A	B	C _S min.	C _{LEF} (Hub Sep.)	E	T (Disc Width)	Part No.	Wt.
1	1/8	4 9/16	3 1/16	1/32	3/16	1 11/16	1/8	1H LEFD	1
1 1/2	1/8	6	3 9/16	1/32	3/16	1 15/16	1/8	1 1/2H LEFD	1
2	1/8	7	4 11/16	1/32	3/16	2 7/16	1/8	2H LEFD	1
2 1/2	3/16	8 3/8	5 3/8	3/64	9/32	3 1/32	3/16	2 1/2H LEFD	1
3	3/16	9 7/16	6 9/16	3/64	9/32	3 19/32	3/16	3H LEFD	1
3 1/2	3/16	11	7 11/16	3/64	13/32	4 3/16	5/16	3 1/2H LEFD	2
4	3/16	12 1/2	8 3/4	3/64	13/32	4 3/4	5/16	4H LEFD	2
4 1/2	3/16	13 5/8	9 11/16	3/64	17/32	5 5/16	7/16	4 1/2H LEFD	2
5	3/16	15 5/16	11 1/16	3/64	17/32	6 1/32	7/16	5H LEFD	2
5 1/2*	3/16	16 3/4	12 7/16	3/64	19/32	6 29/32	1/2	5 1/2H LEFD	2
6*	3/16	18	13 5/16	3/64	19/32	7 13/32	1/2	6H LEFD	2
7*	1/4	20 3/4	15 3/8	1/16	3/4	8 11/16	5/8	7H LEFD	2

* Sizes 5 1/2, 6 and 7 are only available with exposed bolts. Type EB exposed bolts are standard.

① LEF Discs are used only in close coupled applications. One disc is required per coupling.

Note: For ratings and max. bores refer to page 74.

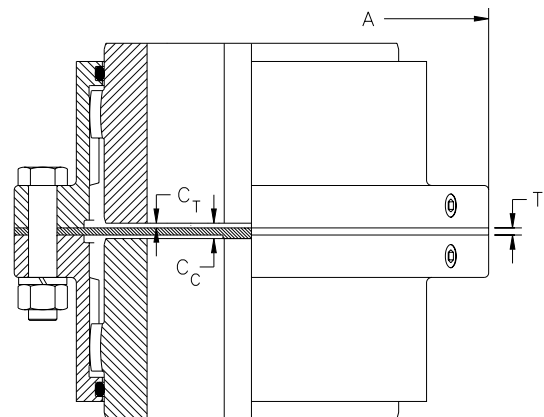
KOP-FLEX Coupling Greases

KOP-FLEX offers greases specifically designed for use in coupling applications. To ensure proper lubrication and long service life, use KOP-FLEX KSG Standard Coupling Grease, or KHP High Performance Coupling Grease. See page 101 for detailed specifications.

For vertical applications, a standard full flex coupling is supplied with a vertical plate, and vertical flange fasteners are used in place of standard. The vertical plate is installed with button down, and is used to support the assembled sleeves.

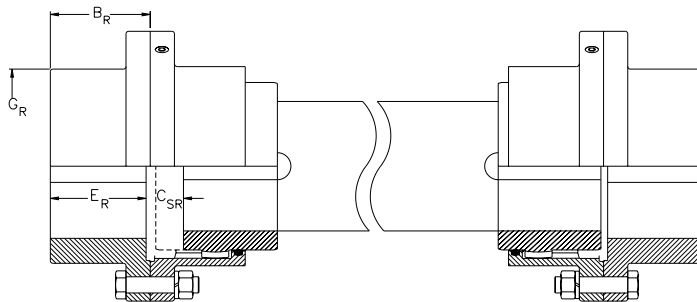
*Coupling Size	Dimensions				Vertical Plate①		Fastener Set (includes gasket)	
	A	C _T	C _C	T	Part No.	Wt.	Part No.	Wt.
1	4 9/16	1/16	1/4	1/8	1H EB VP	1	1 EB VSFS	1
1 1/2	6	1/16	1/4	1/8	1 1/2H EB VP	1	1 1/2 EB VSFS	1
2	7	1/16	1/4	1/8	2H EB VP	2	2 EB VSFS	1
2 1/2	8 3/8	3/32	5/16	1/8	2 1/2H EB VP	2	2 1/2 EB VSFS	2
3	9 7/16	3/32	5/16	1/8	3H EB VP	3	3 EB VSFS	3
3 1/2	11	1/8	7/16	3/16	3 1/2H EB VP	4	3 1/2 EB VSFS	5
4	12 1/2	1/8	7/16	3/16	4H EB VP	7	4 EB VSFS	5
4 1/2	13 5/8	5/32	1/2	3/16	4 1/2H EB VP	10	4 1/2 EB VSFS	7
5	15 5/16	5/32	1/2	3/16	5H EB VP	12	5 EB VSFS	9
5 1/2	16 3/4	5/32	9/16	1/4	5 1/2H EB VP	15	5 1/2 EB VSFS	14
6	18	5/32	9/16	1/4	6H EB VP	19	6 EB VSFS	14
7	20 3/4	3/16	11/16	5/16	7H EB VP	25	7 EB VSFS	22

* Exposed bolts are standard for all sizes.

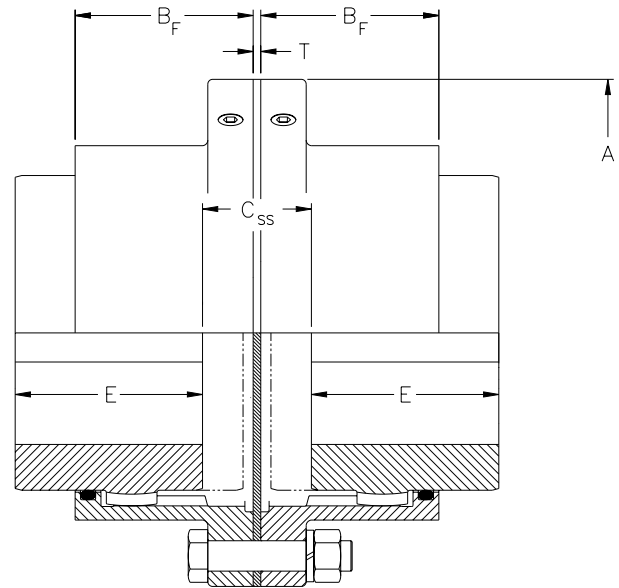


The Series H Slide coupling is designed for drive systems that require greater end float or slide than a conventional application. Spacer couplings, floating shaft arrangements, and most coupling types can be supplied with a Slide flex half in one or both flex half couplings.

For Flex-Rigid arrangements used in floating shaft couplings, no stop plate is required and a standard EB fastener set (FS) is used.



FLOATING SHAFT ASSEMBLY



Coupling Size*	Total Slide①		Dimensions										
	Full-Flex	Flex-Rigid	A	B _F	B _R	C _{SS} Hub & Shaft Separation		C _{SR} Hub & Shaft Separation		E	E _R	T	O
						Max.	Min.	Max.	Min.				
1	1/8	3/32	4 9/16	1 17/32	1 21/32	1/4	3/8	1/8	7/32	1 11/16	1 9/16	1/8	2 3/8
1 1/2	3/8	7/32	6	1 25/32	1 15/16	1/4	5/8	1/8	11/32	1 15/16	1 27/32	1/8	3 1/8
2	7/8	15/32	7	2 11/32	2 3/8	1/4	1 1/8	1/8	19/32	2 7/16	2 9/32	1/8	4
2 1/2	9/16	5/16	8 3/8	2 11/16	3	5/16	7/8	5/32	15/32	3 1/32	2 29/32	1/8	4 7/8
3	1 7/16	3/4	9 7/16	3 9/32	3 9/16	5/16	1 3/4	5/32	29/32	3 19/32	3 15/32	1/8	5 5/8
3 1/2	1 5/8	7/8	11	3 27/32	4 1/8	7/16	2 1/16	5/32	1 1/32	4 3/16	4 1/32	3/16	6 1/2
4	2	1 1/16	12 1/2	4 3/8	4 5/8	7/16	2 7/16	1/4	1 5/16	4 3/4	4 7/16	3/16	7 3/4
4 1/2	2 1/4	1 7/32	13 5/8	4 27/32	5 1/4	1/2	2 3/4	1/4	1 15/32	5 5/16	5 1/16	3/16	8 1/2
5	3 5/16	1 3/4	15 5/16	5 17/32	5 7/8	1/2	3 13/16	1/4	2	6 1/32	5 11/16	3/16	9 1/2
5 1/2	3 9/16	1 7/8	16 3/4	6 7/32	7 5/32	9/16	4 1/8	5/16	2 3/16	6 29/32	6 31/32	1/4	10 1/2
6	4 1/16	2 1/8	18	6 21/32	7 21/32	9/16	4 5/8	5/16	2 7/16	7 13/32	7 15/32	1/4	11 1/2
7	4 7/8	2 9/16	20 3/4	7 11/16	9	11/16	5 9/16	3/8	2 15/16	8 11/16	8 3/4	5/16	13 1/2

*Exposed bolts are standard for all sizes.

Note: For ratings, max. bores and additional dimensions, see page 78.

Coupling Size	Full Flex Coupling			Stop Plate		Fastener Set (Includes Gasket)		Slide Sleeve		Flex Hub	
	No Bore Part No.	Wt.	Finish Bore① Part No.	Part No.	Wt.	Part No.	Wt.	Part No.	Wt.	No Bore Part No.	Wt.
1	1H EB SSFF	10	1H EB SSFF FB	1 EB SP	1	1 EB VSFS	1	1H EB SLEEVE	2	1H FHUB	3
1 1/2	1 1/2H EB SSFF	18	1 1/2H EB SSFF FB	1 1/2 EB SP	1	1 1/2 EB VSFS	1	1 1/2H EB SLEEVE	6	1 1/2H FHUB	3
2	2H EB SSFF	28	2H EB SSFF FB	2 EB SP	2	2 EB VSFS	1	2H EB SLEEVE	8	2H FHUB	6
2 1/2	2 1/2H EB SSFF	50	2 1/2H EB SSFF FB	2 1/2 EB SP	2	2 1/2 EB VSFS	2	2 1/2H EB SLEEVE	14	2 1/2H FHUB	11
3	3H EB SSFF	74	3H EB SSFF FB	3 EB SP	3	3 EB VSFS	3	3H EB SLEEVE	17	3H FHUB	18
3 1/2	3 1/2H EB SSFF	110	3 1/2H EB SSFF FB	3 1/2 EB SP	4	3 1/2 EB VSFS	5	3 1/2H EB SLEEVE	28	3 1/2H FHUB	26
4	4H EB SSFF	170	4H EB SSFF FB	4 EB SP	7	4 EB VSFS	5	4H EB SLEEVE	41	4H FHUB	44
4 1/2	4 1/2H EB SSFF	230	4 1/2H EB SSFF FB	4 1/2 EB SP	10	4 1/2 EB VSFS	7	4 1/2H EB SLEEVE	53	4 1/2H FHUB	62
5	5H EB SSFF	350	5H EB SSFF FB	5 EB SP	12	5 EB VSFS	9	5H EB SLEEVE	80	5H FHUB	90
5 1/2	5 1/2H EB SSFF	400	5 1/2H EB SSFF FB	5 1/2 EB SP	15	5 1/2 EB VSFS	14	5 1/2H EB SLEEVE	89	5 1/2H FHUB	105
6	6H EB SSFF	470	6H EB SSFF FB	6 EB SP	19	6 EB VSFS	14	6H EB SLEEVE	100	6H FHUB	130
7	7H EB SSFF	790	7H EB SSFF FB	7 EB SP	25	7 EB VSFS	22	7H EB SLEEVE	160	7H FHUB	210

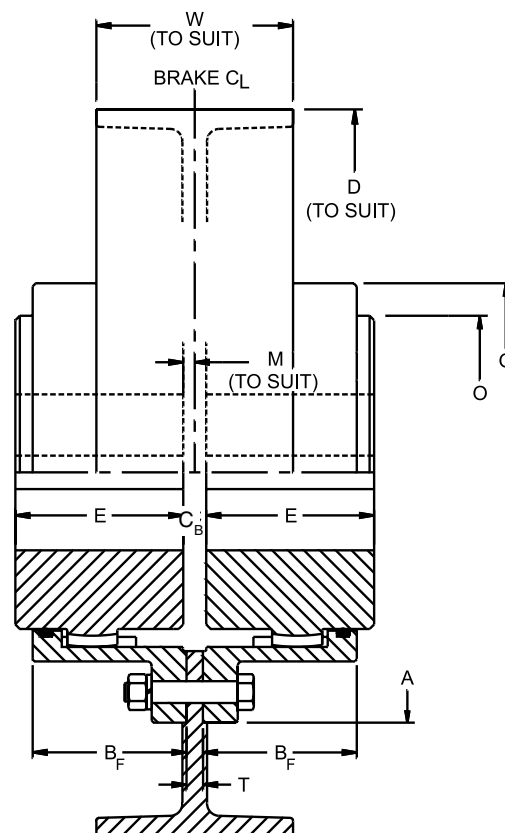
* Exposed bolts are standard for all sizes.

① All finish bores and keyways per AGMA 9002-A86 commercial standard tolerances with interference fit bores. Clearance fit bores are available on request and include one setscrew over keyway.

Series H Brakewheel couplings are comprised of standard full flex couplings with longer flange bolts and an extra gasket. Brakewheels are piloted to the outside diameter of the sleeve flanges. These couplings are also available in flex rigid configurations and with hubs bore for AISE mill motors.

Standard brakewheels are made from carbon steel, but are also commonly supplied in ductile iron for better heat dissipation when braking. The user should specify the required brakewheel material when ordering. The brakewheel dimensions shown below are for reference and can be modified to suit your particular application.

Brakewheels may also be used with the FAST'S full flex, flex rigid, mill motor and double engagement designs. Consult KOP-FLEX for any special requirements.

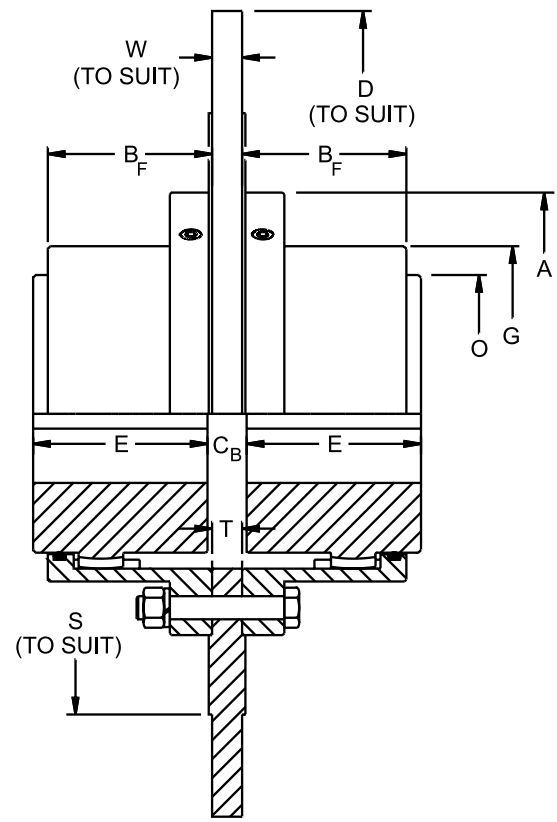


CPLG Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Coupling Dimensions (inches)						Typical Brakewheel Dimensions (inches)		
					A	B _F	C _B	E	G	O	T	D Minimum	Typical W (Ref.)
1	1 5/8	12	7500	15000	4 9/16	1 17/32	1/2	1 11/16	3 1/16	2 3/8	3/8	7	2 3/4
1 1/2	2 1/4	27	17000	34000	6	1 25/32	5/8	1 15/16	3 15/16	3 1/8	1/2	8	3 1/4
2	2 3/4	50	31500	63000	7	2 11/32	5/8	2 7/16	4 15/16	4	1/2	9 5/8	3 3/4
2 1/2	3 1/2	90	56700	113400	8 3/8	2 11/16	3/4	3 1/32	5 7/8	4 7/8	9/16	11 3/8	4 3/4
3	4	160	101000	202000	9 7/16	3 9/32	3/4	3 19/32	6 7/8	5 5/8	9/16	12 5/8	5 3/4
3 1/2	4 1/2	235	148000	296000	11	3 27/32	1	4 3/16	7 29/32	6 1/2	3/4	14 5/8	6 3/4
4	5 1/2	375	236000	472000	12	4 3/8	1	4 3/4	9 1/4	7 3/4	3/4	16 7/8	7 3/4
4 1/2	6	505	318000	636000	13 5/8	4 27/32	1 1/16	5 5/16	10 3/8	8 1/2	3/4	18	8 3/4
5	6 7/8	700	441000	882000	15 5/16	5 17/32	1 5/16	6 1/32	11 9/16	9 1/2	1	19 3/8	9 3/4
5 1/2	7 3/4	920	580000	1160000	16 3/4	6 7/32	1 5/16	6 29/32	12 11/16	10 1/2	1	20 7/8	10 1/4
6	8 5/8	1205	759000	1518000	18	6 21/32	1 5/16	7 13/32	13 7/8	11 1/2	1	23	11 1/4
7	10 3/8	1840	1160000	2320000	20 3/4	7 11/16	1 3/8	8 11/16	16 1/16	13 1/2	1	26	12 1/4

Series H Brake Disc couplings use standard full flex couplings with longer flange bolts and an extra gasket. Brake Discs are piloted to the outside diameter of the sleeve flanges. These couplings are also available in flex rigid configurations and with hubs bore for AISE mill motors.

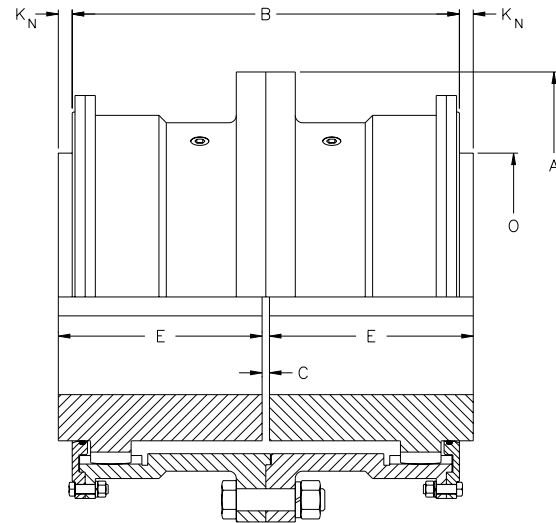
Standard brake discs are made from carbon steel, but are also commonly supplied in ductile iron for better heat dissipation when braking. The user should specify the required brake disc material when ordering. The brake disc dimensions shown below are for reference and can be modified to suit your particular application.

Brake discs may also be used with the FAST'S full flex, flex rigid, mill motor and double engagement designs. Consult KOP-FLEX for any special requirements.

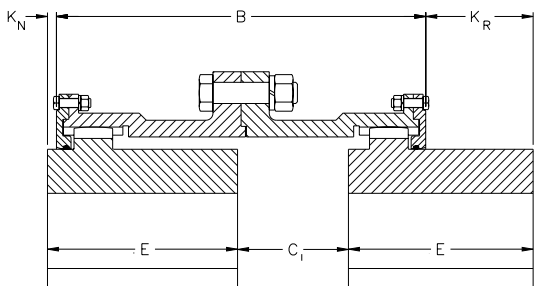


CPLG Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in.)	Peak Torque Rating (lb.-in.)	Coupling Dimensions (inches)						Brake Disc Dimensions (inches)			
					A	B _F	C _B	E	G	O	T	Typical S (Ref.)	Typical D (Ref.)	Typical W (Ref.)
1	1 5/8	12	7500	15000	4 9/16	1 17/32	1/2	1 11/16	3 1/16	2 3/8	3/8	8	14	3/8
1 1/2	2 1/4	27	17000	34000	6	1 25/32	5/8	1 15/16	3 15/16	3 1/8	1/2	8	14, 18	1/2
2	2 3/4	50	31500	63000	7	2 11/32	5/8	2 7/16	4 15/16	4	1/2	10	14, 16, 18	1/2
2 1/2	3 1/2	90	56700	113400	8 3/8	2 11/16	3/4	3 1/32	5 7/8	4 7/8	9/16	12	16, 18, 20 1/4	9/16
3	4	160	101000	202000	9 7/16	3 9/32	3/4	3 19/32	6 7/8	5 5/8	9/16	14 1/4	16, 18, 20 1/4	9/16
3 1/2	4 1/2	235	148000	296000	11	3 27/32	1	4 3/16	7 29/32	6 1/2	3/4	14 1/4	20 1/4, 28	3/4
4	5 1/2	375	236000	472000	12	4 3/8	1	4 3/4	9 1/4	7 3/4	3/4	14 1/4	20 1/4, 28	3/4
4 1/2	6	505	318000	636000	13 5/8	4 27/32	1 1/16	5 5/16	10 3/8	8 1/2	3/4	22	28, 32	3/4
5	6 7/8	700	441000	882000	15 5/16	5 17/32	1 5/16	6 1/32	11 9/16	9 1/2	1	22	28, 32	1
5 1/2	7 3/4	920	580000	1160000	16 3/4	6 7/32	1 5/16	6 5/8	12 11/16	10 1/2	1	22	28, 32	1
6	8 5/8	1205	759000	1518000	18	6 21/32	1 5/16	7 13/32	13 7/8	11 1/2	1	22	32, 36	1
7	10 3/8	1840	1160000	2320000	20 3/4	7 11/16	1 3/8	8 11/16	16 1/16	13 1/2	1	22	32, 36	1

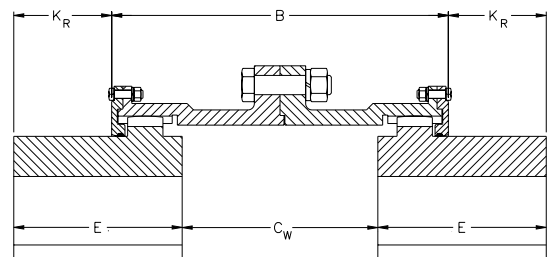
Alloy Steel Series H couplings, size 8 through 30, are identical in design to the standard couplings, except that the material of the hubs and sleeves are alloy steel for higher torque capacity. Grade 8 bolts are substituted for higher strength as well. The bolts are special with respect to body length, thread length, and bolt body tolerance. All end rings are gasketed and are bolted to the sleeves which can be easily removed for inspection of the gear teeth without removing the hub from the shaft. Hubs may be installed in the standard position, or with one or both hubs reversed to accommodate various shaft separations. **Sizes 8 through 30 are available in exposed bolt only.**



Coupling Size	Maximum Bore with Standard Key	Rating HP / 100 RPM	Torque Rating (lb.-in. x 1000)	Peak Torque Rating (lb.-in. x 1000)	Maximum Speed (RPM)	Weight with Solid Hubs (lb.)	Dimensions						
							A	B	C	C ₁	C _w	E	O
8	10 3/4	4179	2633	7899	1750	1430	23 1/4	19 1/2	3/8	5 9/16	10 3/4	9 13/16	14
9	11 3/4	5938	3741	11223	1625	2000	26	21 3/4	1/2	6 1/4	12	10 7/8	15 1/2
10	13	8167	5145	15435	1500	2670	28	24	1/2	7 1/8	13 3/4	12	17 1/2
11	15	10848	6834	20502	1375	3520	30 1/2	26 1/4	1/2	7 7/8	15 1/4	13 1/8	19 1/2
12	16 1/4	13489	8498	25494	1250	4450	33	27 3/4	1/2	8 1/8	15 3/4	13 7/8	21 1/2
13	17 1/2	16929	10665	31995	1125	5410	35 3/4	29 1/2	3/4	8 7/16	16 1/8	14 5/8	23
14	18 3/4	20779	13091	39273	1000	6600	38	31 1/4	3/4	9	17 1/4	15 1/2	25
15	20 3/4	25262	15915	47745	875	8040	40 1/2	33 1/8	3/4	9 7/16	18 1/8	16 1/2	27
16	22	30208	19031	57093	750	9680	43	35	1	9 7/8	18 3/4	17 3/8	29
18	25 1/4	39584	24938	74814	500	12500	47 1/4	36 1/8	1	10 1/4	19 1/2	18	33
20	27 1/4	54000	34020	102060	400	17900	53 1/2	42 3/8	1	12 3/8	23 3/4	21 1/8	36 1/2
22	30	71456	45017	135051	300	23300	59	46	1	13 3/4	26 1/2	23	40
24	33 1/4	79462	50061	150183	200	30300	64 1/4	49 1/2	1	15	29	24 3/4	44 1/2
26	36 3/4	99449	62653	187959	200	37700	68 1/2	53	1	15 5/8	30 1/4	26 1/2	48 1/2
28	40	123703	77933	233799	200	45200	73 3/4	54 1/4	1	15 7/8	30 3/4	27 1/8	52 1/2
30	43 1/2	150637	94901	284703	200	52700	78	55 1/4	1	15 7/8	30 3/4	27 5/8	56 1/2



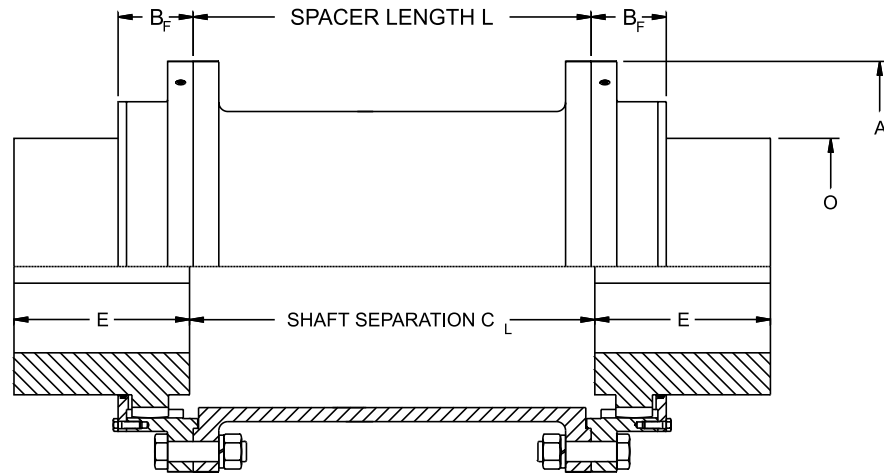
ONE HUB REVERSED



TWO HUBS REVERSED

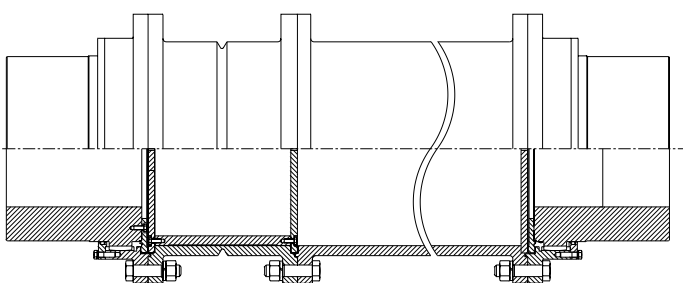
Coupling Size	Center Flange			End Ring		
	Quantity	Size & Length	Bolt Circle	Quantity (each)	Size & Length	Bolt Circle
8	16	1 1/8 x 4 1/8	20 3/4	10	1/2 x 2	19 3/8
9	18	1 1/4 x 4 1/2	23 1/4	12	5/8 x 2 3/16	21 3/4
10	18	1 3/8 x 5 3/8	25 1/4	12	5/8 x 2 3/16	23 7/8
11	18	1 1/2 x 5 7/8	27 1/2	12	5/8 x 2 3/16	26 1/16
12	18	1 1/2 x 6 1/8	30	12	3/4 x 2 9/16	28 5/16
13	18	1 5/8 x 6 3/8	32 1/4	12	3/4 x 2 9/16	30 1/2
14	18	1 3/4 x 6 5/8	34 1/2	14	3/4 x 2 9/16	32 5/8
15	20	1 3/4 x 6 5/8	36 3/4	14	7/8 x 2 7/8	35
16	20	2 x 7 3/8	39	14	7/8 x 2 7/8	37 1/8
18	22	2 x 7 3/8	43 1/4	14	7/8 x 2 7/8	41 3/8
20	22	2 1/4 x 7 5/8	48 3/4	16	1 x 3 5/8	46 1/4
22	22	2 1/2 x 8 1/8	53 1/2	16	1 x 3 5/8	50 3/4
24	22	2 3/4 x 8 7/8	58 1/4	16	1 1/8 x 4 1/8	55
26	24	2 3/4 x 8 7/8	62 1/2	18	1 1/8 x 4 1/8	59 1/4
28	22	3 x 9 5/8	67 1/4	16	1 1/4 x 4 1/4	63 11/16
30	24	3 x 9 5/8	71 1/2	18	1 1/4 x 4 1/4	68 3/16

Alloy Steel Series H spacer couplings are available for applications with extended shaft separations and offer the same higher torque ratings of the close coupled alloy steel design. Bolt on end rings are supplied to allow inspection of the hub teeth without removing the hub from the shaft.

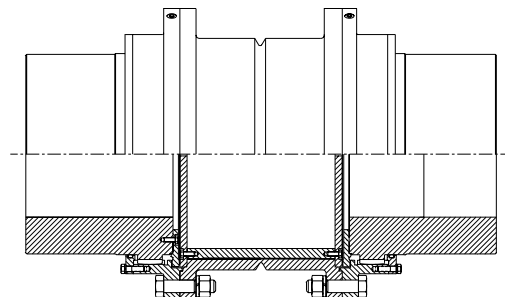


Coupling Size	Maximum Bore with Std. Key	Rating HP/100 RPM	Torque Rating (lb.-in. x 1000)	Peak Torque Rating (lb.-in. x 1000)	Maximum Speed (RPM)	Dimensions			
						A	B _F	E	O
8	10 3/4	4179	2633	7899	1750	23 1/4	4 3/8	9 13/16	14
9	11 3/4	5938	3741	11223	1625	26	4 7/8	10 7/8	15 1/2
10	13	8167	5145	15435	1500	28	5 1/8	12	17 1/2
11	15	10848	6834	20502	1375	30 1/2	5 7/16	13 1/8	19 1/2
12	16 1/4	13489	8498	25494	1250	33	6	13 7/8	21 1/2
13	17 1/2	16929	10665	31995	1125	35 3/4	6 11/16	14 5/8	23
14	18 3/4	20779	13091	39273	1000	38	6 15/16	15 1/2	25
15	20 3/4	25262	15915	47745	875	40 1/2	7 17/32	16 1/2	27
16	22	30208	19031	57093	750	43	8 7/32	17 3/8	29
18	25 1/4	39584	24938	74814	500	47 1/4	8 13/32	18	33
20	27 1/4	54000	34020	102060	400	53 1/2	9 3/8	21 1/8	36 1/2
22	30	71456	45017	135051	300	59	9 13/16	23	40
24	33 1/4	79462	50061	150183	200	64 1/4	10 1/4	24 3/4	44 1/2
26	36 3/4	99449	62653	187959	200	68 1/2	11 3/8	26 1/2	48 1/2
28	40	123703	77933	233799	200	73 3/4	11 3/4	27 1/8	52 1/2
30	43 1/2	150637	94901	284703	200	78	12 3/16	27 5/8	56 1/2

Shear spacer designs are used where there is a need to prevent large peak torques from being transmitted back through the drive train. This design acts as a fuse to prevent damage to large, expensive drive train equipment due to wrecks or cobbles in the mill stands.



Combination Spacer Design with Shear



Shear Spacer for Torque Overload Release

KOP-FLEX ships main mill drive coupling in less than 24 hours!



Surrounded by some of our huge stock, KOP-FLEX' operations manager sends out a Size #26.

KOP-FLEX recently received an emergency call from a major hot strip mill. It was late afternoon. A finishing stand main drive coupling had gone down and they needed another Size #18 immediately. We packed the coupling components through the night and air shipped them the following morning.

■ “Stock” couplings ready for immediate shipment

KOP-FLEX maintains a full inventory of rough bored main drive couplings from Sizes #8-30, to fit bores up to 40” (1,000mm.) in diameter. We can ship these immediately.

■ Finish bored and keywayed fast

The KOP-FLEX plant is open 24 hours a day, seven days a week. Call in your shaft information anytime, including Saturday and Sunday. We will work around the clock to finish bore and keyway a coupling to your specifications.

■ Quick turnaround on custom applications

KOP-FLEX also stocks composite forgings for mill drive couplings. We can quickly machine these forgings to satisfy special requirements like flange boltings, non-standard hub lengths, etc.

■ Proven performers in the mill

KOP-FLEX has 75 years of proven performance in mill duty couplings. Thousands of our heavy duty couplings are in service, many with over 50 years of continuous operation. Our engineering staff is second to none in the industry. Take advantage of their extensive coupling knowledge. We eagerly await an opportunity to work with you.



KOP-FLEX stocks a complete line of forgings, ready for custom machining.

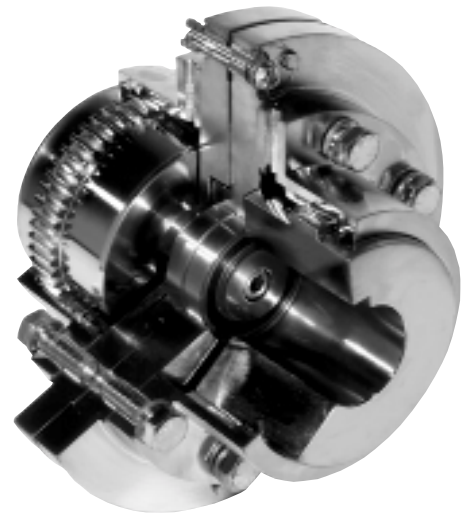
For immediate service call 410-768-2000

KOP-FLEX® Torque Overload Release Couplings

Series H Shear Pin Cartridge

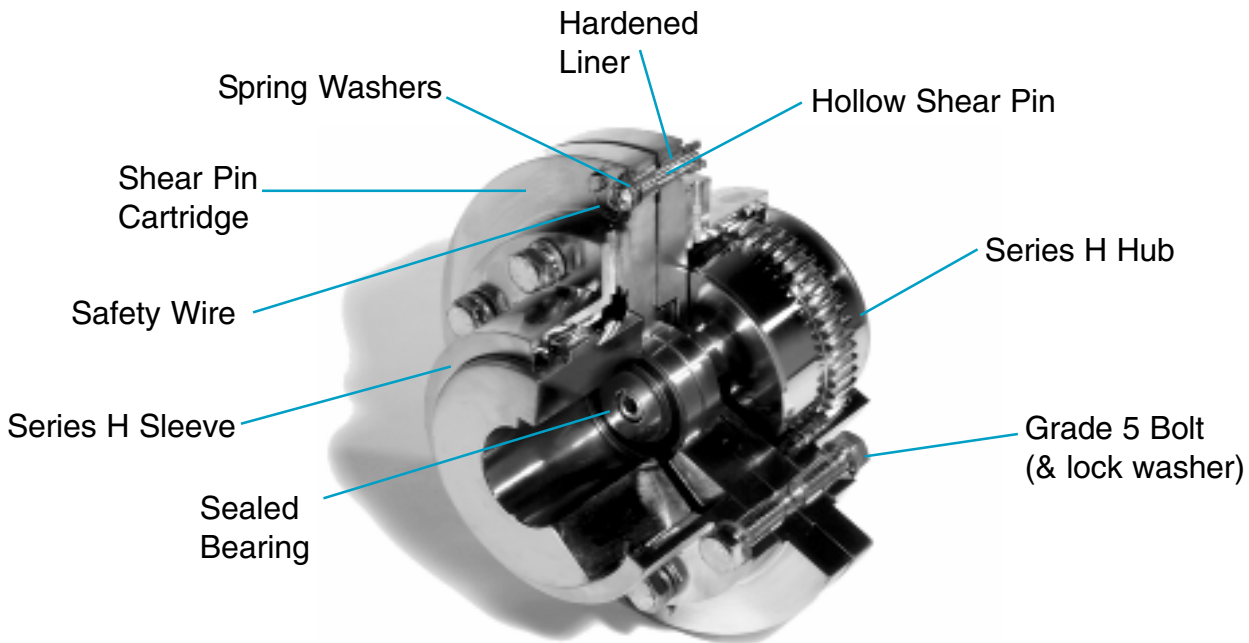
FAST'S Shear Pin

FAST'S Breaking Pin



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In the drive systems today equipment is designed closer to the actual operating conditions to minimize capital cost. It is becoming increasingly more important to provide an overload device to protect the equipment from unexpected shock loads. To this end, KOP-FLEX has designed a shear cartridge assembly to be mounted between the rolling mill stand or gearbox and the driving equipment.

KOP-FLEX Shear Pin Cartridge coupling is a Series H type coupling designed to physically disconnect the driving and driven equipment during torque overload. The purpose of this design is to prevent damage to the equipment - motor, gearbox, pump, etc. - from damage due to the torque overload. KOP-FLEX shear pin couplings are used to limit the peak torque to a predetermined safe value. This value is greater than the normal starting torque of the system.

The shear pins shear at the predetermined specified design value and physically separates the driving from the driven half of the coupling. The coupling halves separate then rotate on the sealed radial ball bearings

of the shear pin cartridge without transmitting any torque at this point. The drive can then be shut off, the shear pins replaced, and the operation restarted without disassembling the coupling or moving the driving or the driven equipment. It is designed to minimize the downtime which means quick operation at a low cost.

The uniqueness of KOP-FLEX' design is the cartridge and the shear pin. In typical shear pins the shear groove in the pin produces stress risers which under cyclic loading (shear and/or bending) can magnify these stresses to produce a premature fatigue of the pin under normal operation. Essentially, the typical pin fails under normal conditions instead of the overload conditions as it normally should. The unique hollow shear pin design minimizes premature failure from fatigue under normal operation. The KOP-FLEX hollow shear pin design also makes for a cleaner breaking of the pin which reduces the likelihood of broken pins jamming into the shear flanges and causing damage to the coupling and equipment. These shear pins are made from carbon or alloy steel depending on the torque requirements.

KOP-FLEX' design offers unique features and advantages as outlined here:

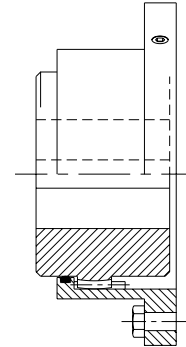
- Increases the coupling reliability
- Minimize downtime through quick start up after shear pin breakage
- Minimizing premature shear pin breakage
- Decreases the cost of rebuilding the coupling after shear pin breakage
- Off the shelf availability for quick shipment



Hollow Shear Pin

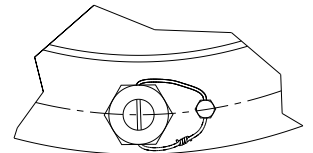
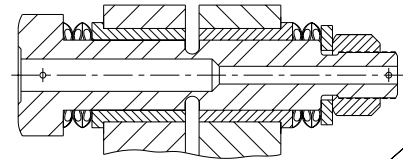
Standard Series H Flex Half

- O'ring style seal design with exposed bolts
- Axial slide for ease of adjustment during installation and operation
- Curved face gear tooth design for large misalignment capacity
- Readily available from KOP-FLEX stock or through distributors worldwide
- Interchangeable with existing gear couplings
- Off the shelf for quick delivery



Shear Pin

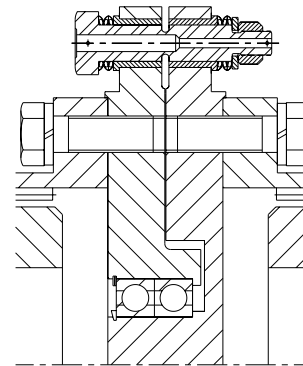
- Hollow shear pin - can be selected for any torque value
- Two for standard, up to four pins per couplings for high torque applications - available in incremental torque ranges
- Carbon steel and alloy steel material for various torque capacity
- Unique design of the shear pins minimizes premature failure due to fatigue
- From a safety point, the shear pins are wired together to prevent them from dislodging from the coupling after shear breakage.



Sealed Radial Ball Bearings

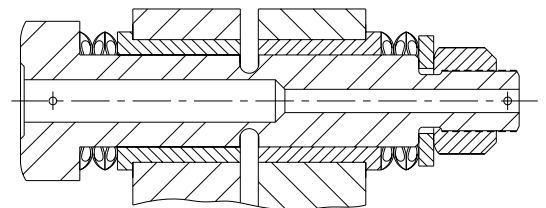
The key to long cartridge life is the ability to rotate freely when disengaged after shearing the pins. KOP-FLEX incorporates seal radial ball bearings rather than bushings to ensure a trouble free operation. An important point in any rotational equipment there are centrifugal forces which pushes the lubrication to the outside diameters. While the bushing may be lubricated initially, it will become dry after several cycles. Features of our design:

- Ball bearings allows for continuous operation after the shear pin breakage;
- Sealed bearing - no lubrication.



Spring loaded washers and hardened liners

- The bushing holes are line reamed in the cartridge assembly to ensure equal loading on each pin.
- Hardened liners (bushings) prevents coupling shear pin hole damage from the shearing of the pins;
- Spring loaded bevel washers force the pin apart after shearing to prevent the pins from welding and transmitting torque.



The Shear Pin cartridge coupling is available in many design options, see pages 94 to 98, for details. The couplings are available in close coupled, spacer design and two different types of floating shaft designs to accommodate any of your shaft separation (distance between shaft end) requirements.

Values listed are intended only as a general guide, and are typical of usual service requirements. For systems which frequently utilize the peak torque capability of the power source, verify that the magnitude of this peak torque does not exceed the 1.0 Service Factor Rating of the coupling selected. Applications which involve extreme repetitive shock or high-energy load absorption characteristics should be referred — with full particulars — to KOP-FLEX.

Values contained in the table are to be applied to smooth power sources such as electric motors and steam turbines. For drives involving internal combustion, engines of four or five cylinders, add 1.0 to the values listed, for six or more cylinders, add 0.5 to the values listed. For systems utilizing AC or DC Mill Motors as the prime mover refer to Note (1).

Application	Typical Service Factor
AGITATORS	
Pure Liquids	1.0
Liquids & Solids	1.25
Liquids — Variable Density	1.25
BLOWERS	
Centrifugal	1.0
Lobe	1.5
Vane	1.25
BRIQUETTE MACHINES	2.0
CAR PULLERS — Intermittent Duty	1.5
COMPRESSORS	
Centrifugal	1.0
Centriaxial	1.25
Lobe	1.5
Reciprocating — Multi-Cylinder	2.0
CONVEYORS — LIGHT DUTY	
UNIFORMLY FED	
Apron, Bucket, Chain, Flight, Screw	1.25
Assembly, Belt	1.0
Oven	1.5
CONVEYORS — HEAVY DUTY	
NOT UNIFORMLY FED	
Apron, Bucket, Chain, Flight, Oven	1.5
Assembly, Belt	1.25
Reciprocating, Shaker	2.5
CRANES AND HOISTS (NOTE 1 and 2)	
Main hoists, Reversing	2.5
Skip Hoists, Trolley & Bridge Drives	2.0
Slope	2.0
CRUSHERS	
Ore, Stone	3.0
DREDGES	
Cable Reels	1.75
Conveyors	1.5
Cutter Head Jig Drives	2.5
Maneuvering Winches	1.75
Pumps	1.75
Screen Drives	1.75
Stackers	1.75
Utility Winches	1.5
ELEVATORS (NOTE 2)	
Bucket	1.75
Centrifugal & Gravity Discharge	1.5
Escalators	1.5
Freight	2.5
FANS	
Centrifugal	1.0
Cooling Towers	1.5
Forced Draft	1.5
Induced Draft without Damper	
Control	2.0
FEEDERS	
Apron, Belt, Disc, Screw	1.25
Reciprocating	2.5

Application	Typical Service Factor
GENERATORS —	
(Not Welding)	1.0
HAMMER MILLS	2.0
LAUNDRY WASHERS —	
Reversing	2.0
LAUNDRY TUMBLERS	2.0
LINE SHAFT	1.5
LUMBER INDUSTRY	
Barkers — Drum Type	2.0
Edger Feed	2.0
Live Rolls	2.0
Log Haul — Incline	2.0
Log Haul — Well type	2.0
Off Bearing Rolls	2.0
Planer Feed Chains	1.75
Planer Floor Chains	1.75
Planer Tilting Hoist	1.75
Slab Conveyor	1.5
Sorting Table	1.5
Trimmer Feed	1.75
MARINE PROPULSION	
Main Drives	2.0
MACHINE TOOLS	
Bending Roll	2.0
Plate Planer	1.5
Punch Press — Gear Driven	2.0
Tapping Machines	2.5
Other Machine Tools	
Main Drives	1.5
Auxiliary Drives	1.25
METAL MILLS	
Draw Bench — Carriage	2.0
Draw Bench — Main Drive	2.0
Forming Machines	2.0
Slitters	1.5
Table Conveyors	
Non-Reversing	2.25
Reversing	2.5
Wire Drawing & Flattening Machine	2.0
Wire Winding Machine	1.75
METAL ROLLING MILLS (NOTE 1)	
Blooming Mills	*
Coilers, hot mill	2.0
Coilers, cold mill	1.25
Cold Mills	2.0
Cooling Beds	1.75
Door Openers	2.0
Draw Benches	2.0
Edger Drives	1.75
Feed Rolls, Reversing Mills	3.5
Furnace Pushers	2.5
Hot Mills	3.0
Ingot Cars	2.5
Kick-outs	2.5
Manipulators	3.0
Merchant Mills	3.0
Piercers	3.0
Pusher Rams	2.5
Reel Drives	1.75
Reel Drums	2.0
Reelers	3.0
Rod and Bar Mills	1.5
Roughing Mill Delivery Table	3.0
Runout Tables	
Reversing	3.0
Non-Reversing	2.0
Saws, hot & cold	2.5
Screwdown Drives	3.0
Skelp Mills	3.0
Slitters	3.0
Slabbing Mills	3.0
Soaking Pit Cover Drives	3.0
Straighteners	2.5
Tables, transfer & runout	2.0
Thrust Block	3.0
Traction Drive	3.0
Tube Conveyor Rolls	2.5
Unscramblers	2.5
Wire Drawing	1.5
MILLS, ROTARY TYPE	
Ball	2.25
Dryers & Coolers	2.0
Hammer	1.75
Kilns	2.0

Application	Typical Service Factor
Pebble & Rod	2.0
Pug	1.75
Tumbling Barrels	2.0
MIXERS	
Concrete Mixers	1.75
Drum Type	1.5
OIL INDUSTRY	
Chillers	1.25
Paraffin Filter Press	1.75
PAPER MILLS	
Barker Auxiliaries, Hydraulic	2.0
Barker, Mechanical	2.0
Barking Drum Spur Gear Only	2.25
Beater & Pulper	1.75
Bleacher	1.0
Calenders	2.0
Chippers	2.5
Coaters	1.0
Converting Machines, except Cutters, Platers	1.5
Couch Roll	1.75
Cutters, Platers	2.0
Cylinders	1.75
Disc Refiners	1.75
Dryers	1.75
Felt Stretcher	1.25
Felt Whipper	2.0
Jordans	1.75
Line Shaft	1.5
Log Haul	2.0
Pulp Grinder	1.75
Press Roll	2.0
Reel	1.5
Stock Chests	1.5
Suction Roll	1.75
Washers & Thickeners	1.5
Winders	1.5
PRINTING PRESSES	1.5
PULLERS — Barge Haul	2.0
PUMPS	
Centrifugal	1.0
Boiler Feed	1.5
Reciprocating	
Single Acting	
1 or 2 Cylinders	2.25
3 or more Cylinders	1.75
Double Acting	2.0
Rotary, Gear, Lobe, Vane	1.5
RUBBER INDUSTRY	
Mixer — Banbury	2.5
Rubber Calendar	2.0
Rubber Mill (2 or more)	2.25
Sheeter	2.0
Tire Building Machines	2.5
Tire & Tube Press Openers	1.0
Tubers & Strainers	2.0
SCREENS	
Air Washing	1.0
Grizzly	2.0
Rotary — Stone or Gravel	1.5
Traveling Water Intake	1.25
Vibrating	2.5
SEWAGE DISPOSAL EQUIPMENT	
Bar Screens	1.25
Chemical Feeders	1.25
Collectors, Circuline or Straightline	1.25
Dewatering Screens	1.25
Grit Collectors	1.25
Scum Breakers	1.25
Slow or Rapid Mixers	1.25
Sludge Collectors	1.25
Thickeners	1.25
Vacuum Filters	1.25
STEERING GEAR	1.0
STOKERS	1.0
WINCH	1.5
WINDLASS	1.75

* Refer to KOP-FLEX

NOTES

- (1) Maximum Torque at the coupling must not exceed Rated Torque of the coupling.
- (2) Check local and industrial safety codes.

DATA REQUIRED WITH THE ORDER

1. Size and type from the catalog, see below for selection.
2. Hub bore and keyway or shaft diameter and required tolerance. Specify AGMA standard 9002-A86 or DIN standards as required.
3. Application Power (Hp or kW), Speed (rpm), and type of application.
4. Required Torque Overload or Shear breaking torque for the application.

SELECTION GUIDE

- I. Determine the application Power (Hp or kW), Operating Speed (RPM), type of application, hub bore or shaft diameter.
- II. Select the appropriate Service Factor (S.F.) from table on page 92, if the equipment is not listed consult Kop-Flex.
- III. Calculate application torque:

$$\text{Torque (lb-in.)} = \frac{\text{Hp} \times 63025 \times \text{S.F.}}{\text{RPM}}$$

OR

$$\text{Torque (N-m)} = \frac{\text{kW} \times 9549 \times \text{S.F.}}{\text{RPM}}$$
- IV. Select the type of coupling required from the pages 94 through 99.
- V. Select the coupling size from pages 94 through 99. The coupling torque rating must be greater than the calculated torque from Section III above.
- VI. Verify the maximum speed rated for the coupling per pages 94 to 99 meets the requirement of the application. Contact KOP-FLEX for high speed applications which may require balancing.
- VII. Verify the coupling maximum bore capacity exceeds the application bore requirement. If the coupling maximum bore capacity is less than the required bore, select the appropriate coupling size based on data from the catalog pages 94 through 99.
- VIII. Based on the application determine the torque overload release value. Specify this value at the time of order. Consult KOP-FLEX for any questions.
- IX. If application is other than Close Coupled, determine the distance between shaft ends (shaft separation or DBSE) and check the minimum "C" dimension on pages 95 through 97.

EXAMPLE:

Application: Motor to Gearbox with a 1.5 Service Factor requirement

Operating Power: 550 Hp (738 kW)

Operating Speed: 800 rpm

Shaft Size: 4.72 inches (120 mm) diameter

Selection for Example:

- I. 550 Hp (738 kW) @ 800 rpm
- II. S.F. = 1.5
- III. Torque = $\frac{550 \times 63025 \times 1.5}{800} = 64,995 \text{ lb-in.}$
or 7343 N-m.
- IV. Required application is for KOP-FLEX type HSP (Close Coupled).
- V. Selection based on torque is #3 HSP from pages 94-95 of this catalog.
- VI. Coupling meets the speed requirement of 800 rpm (Coupling rating for #3HSP is 3250 rpm).
- VII. Bore required is 4.72 inches (120 mm) minimum. Kop-Flex #3 HSP maximum bore capacity is 4.38 inches (111 mm) which is less than the required bore. Select size #3.5 HSP instead, this meets bore, torque and speed requirements of pages 94-95.
- VIII. Shear or Overload torque - select a specific value based on application. For size #3.5 HSP shear torque range can be 23,400 - 222,000 lb-in. (2640 - 25100 N-m).
- IX. No shaft length or DBSE required since this application calls for a close coupled coupling.



KOP-FLEX, the world's leading manufacturer of flexible shaft couplings, was one of the first companies to develop greases especially for use as shaft coupling lubricants. We recognized that couplings must use greases with certain special qualities, and as the company most likely to understand these very special needs, we knew that most commercial grease formulations will not insure adequate performance and are not good coupling lubricants.

Coupling grease, unlike bearing or general purpose grease, must withstand the centrifugal forces created by a rotating coupling.

KOP-FLEX Coupling Greases are specifically formulated to resist the high centrifugal forces associated with all applications, including slow motor speeds. These forces can cause the all-important base oil to separate from the soap thickeners and additives. Unlike greases with lithium-based thickeners, KOP-FLEX KHP and KSG greases use polyethylene thickeners, with a density closer to that of oil, and are therefore much less susceptible to separation. Heavier thickeners and additives can separate and migrate into the gear teeth or other working parts, displacing the lubricating oils from where they are most needed.

KOP-FLEX® KSG Standard Coupling Grease

KSG is an NLGI Grade #1 coupling grease with E.P. additives for use in any grease-packed coupling, such as gear, grid, and chain-type couplings, in standard industrial service. Superior to the commonly available greases adapted to coupling use, KOP-FLEX KSG was developed specifically as a coupling lubricant.

KOP-FLEX KHP High Performance Coupling Grease

KHP grease is an NLGI #1 grease with E. P. additives which exceeds the design requirements needed for extended operating and relubrication intervals. KHP grease is recommended for high-speed grease lubricated gear couplings in petrochemical, process, and utility industries.

Waverly Torque Lube 'A'® Gear Spindle Grease

Torque Lube 'A' was developed to solve the special lubrication problems of relatively low speed, highly loaded gear spindle couplings used extensively in metal rolling mills. Torque Lube 'A' has consistently provided protection in applications demanding a lubricant with extreme pressure protection, high heat and shock loading, excellent wear protection, and resistance to water washout. This grease is compounded with a concentration of Molybdenum Disulfide and other additives to provide extreme pressure protection. These additives cannot resist the effects of centrifugal forces; therefore, Waverly Torque Lube 'A' should not be used in a standard coupling without consulting KOP-FLEX.

*Waverly Torque Lube 'A'® is available in 40-pound, 120-pound, and 400-pound containers and in bulk tank trailer loads of 12,000-pound minimum. Contact KOP-FLEX to order.

Tests (1)	KHP	KSG	Waverly Torque Lube 'A'®
Thickener	Polyethylene	Polyethylene	Lithium 12 Hydroxy Stearate Soap
Base Oil Viscosity @ 100°, F, SSU @ 210°, F, SSU @ 100°, C, CS	1800 185 N/A	3600 220 N/A	— 150 31 min.
NLGI Grade	1	1	1
Penetration— 60 strokes (Worked) 10,000 strokes	315-340 330-350	310-340 310-350	310-340 @ 77°F —
Timken O.K. Load, Pounds	45	45	60
Four ball EP (ASTM D 2596) Load wear index, kg Weld point, kgf	35 245	24 245	100 500
Four ball wear, scar, mm (ASTM D 2266)	.70	.75	.33
Dropping Point, °F	195	195	340
Oxidation and rust inhibitors	yes	yes	yes
Centrifugal separation, (ASTM D 4425)	K36=2/24	K36=8/24	N/A
Operating range, °F	-40° to +190°	-40° to +190°	Mill Ambient
Color	Amber	Blue-Green	Black

All KOP-FLEX greases are lead free.

			KSG Grease	KHP Grease
Container	Unit Wt	No. of Units	Part No.	Part No.
Grease Gun Cartridge	14 oz.	1	KSG 14OZ	KHP 14OZ
Grease Gun Cart., Case	14 oz.	25	KSG 14OZ CASE	KHP 14OZ CASE
1 lb Can	1 lb.	1	KSG 1LB	KHP 1LB
1 lb Can, Case	1 lb.	24	KSG 1LB CASE	KHP 1LB CASE
5 lb Can	5 lb.	1	KSG 5LB	KHP 5LB
5 lb Can, Case	5 lb.	6	KSG 5LB CASE	KHP 5LB CASE
Pail	35 lb.	1	KSG 35LB	KHP 35LB
Keg	120 lb.	1	KSG 120LB	KHP 120LB
Drum	395 lb.	1	KSG 395LB	KHP 395LB

Selection Guide to KOP-FLEX Coupling Greases

- KSG is excellent for standard and routinely serviced couplings operating at normal motor speeds.
- KHP has both exceptional lubricating and high operating temperature properties. As a general rule, if the coupling is balanced or if very long periods of operation are desired, use KHP.
- Waverly Torque Lube 'A' is a special purpose grease for relatively slow speed, highly loaded mill spindle couplings. It is not intended for use in other types of couplings.

Grease Type	Application	Typical Speed	Coupling Type	Operating Range (F°)
KHP High Performance	Petrochemical, process and critical service	Highest coupling RPM, usually over 3600 RPM	High performance gear Critical standard applications	-40° to + 190°
KSG Standard	General purpose industrial	Standard motor speeds	Standard gear, grid and chain	-40° to + 190°
Waverly Torque Lube 'A'	Rolling mill, high torque	Normal rolling mill motor speeds	Gear spindle and slippers	Covers mill temperature range

Notice to Users

All KOP-FLEX greases are manufactured for KOP-FLEX and are for industrial use only. These products should not be ingested and should be properly stored and kept away from children. Pay attention to container labeling and any precautionary statements. Material Safety Data Sheets are available upon request. Use absorbent material to clean up any spill and dispose of the waste in accordance with state and local regulations.

No warranties, expressed or implied, including patent warranties, warranties of merchantability, fitness for use, are made by KOP-FLEX, Inc. with respect to products described on information set forth herein. Nothing contained herein shall constitute a permission or recommendation to practice any invention covered by a patent without a license from the owner of the patent.

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