Deltaflex Coupling Design

The Deltaflex coupling is the real solution to installation, misalignment, and performance problems. Conventional couplings – even when carefully aligned to the manufacturer's specifications – cannot match the low level of vibration, moment of inertia, and additional cushion for future misalignment of a visually aligned Deltaflex coupling.

In addition, the Deltaflex coupling gives longer life to equipment shaft bearings. That means longer operating time and reduced maintenance cost. The Deltaflex can handle greater shaft misalignment without generating heavy reaction loads on the equipment shaft bearings.

A properly applied and installed Deltaflex coupling offers more equipment protection compared to conventional couplings.

Features

- Maximum misalignment capabilities, with negligible reactionary load, for longer equipment bearing life. (see illustrations A, B and C)
- Operates as smoothly when misaligned as when perfectly aligned
- No lubrication and no maintenance required
- Equipment can be visually aligned. No special tools are required, which saves on installation time and cost
- Eliminates premature equipment bearing and seal failure resulting from misalignment forces. This means greater equipment productivity
- Torsionally stiff coupling with no backlash means it is capable of high speed applications, within catalog ratings
- Provides long-term performance and economy
- Available in 5 basic sizes, from 10HP to 900HP
- Standard all-metal and stainless steel versions are both available from stock. Many configurations are available, including shaft-to-shaft, spacer, floating shaft, and special assemblies

Type 1 Deltaflex

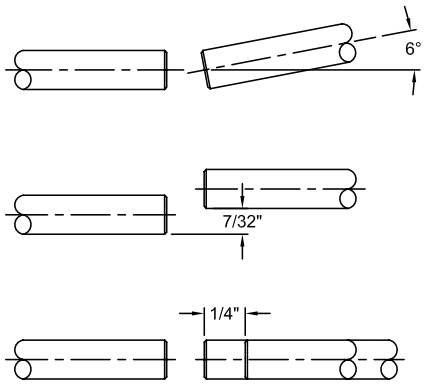


Illustration A
Misalignment Capability (Size 60 Illustrated)

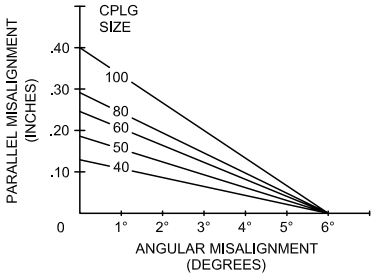


Illustration B
Standard Series

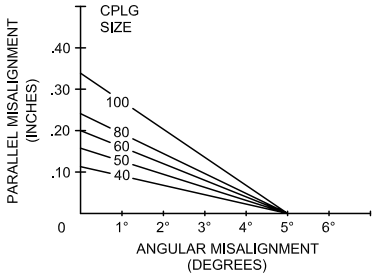


Illustration C
HT Series

Note: ■ Illustrations B and C assume no axial displacement.

SP

Deltaflex Coupling Design

As graphs A and B clearly illustrate, radial load placed on the shaft bearings of the connected equipment by conventional couplings can substantially reduce bearing life and induce detrimental vibration. If the misaligned coupling creates a radial load – as can be the case with conventional couplings – then nearly 75% of B-10 bearing design life is sacrificed. By using the Deltaflex coupling, B-10 life remains close to 100% of design life, even at maximum misalignment.

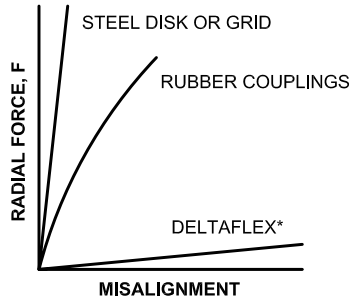
Because the Deltaflex coupling is designed for infinite fatigue life at maximum angular misalignment – at rated torque – inadvertent misalignment caused by temperature expansion, equipment frame flexing, foundation movement, environment, etc. will not shorten the life of the coupling or life of the connected equipment.

Patented Design Concept***

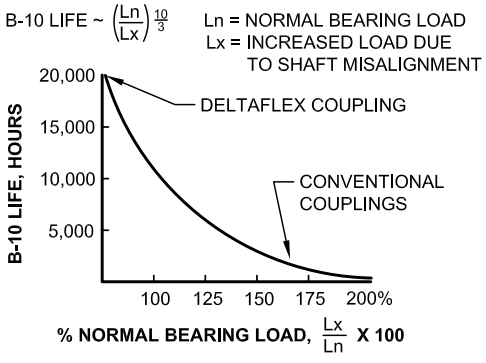
The concept of the Deltaflex coupling and its misalignment capabilities can be illustrated best when compared to conventional coupling design (see Graphs C and D). Most conventional couplings' torque and misalignment capabilities are dependent upon a single flexing member. Soft elastomers are limited by the compressive or tensile strengths of the material. Misalignment is a function and limitation of the material properties and method of connection to the hubs.

While other all-metal flexible couplings share the advantage of high torque transmission and better temperature and corrosion resistance, they are typically limited to less than 1/2° angular with less than 0.005 inch parallel misalignment. Approaching or exceeding these limits will exert undesired radial loads and vibration on the connected equipment.

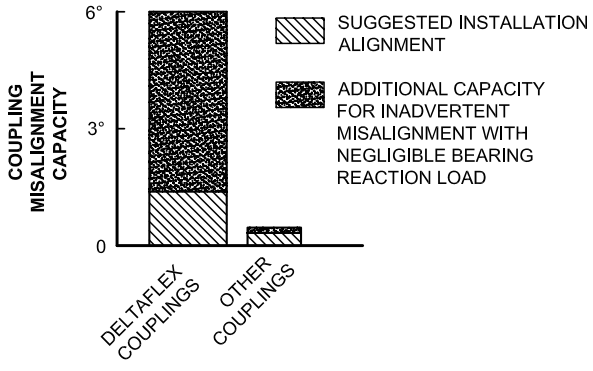
Note: ■ *** U.S. Patent Number: 4033144.



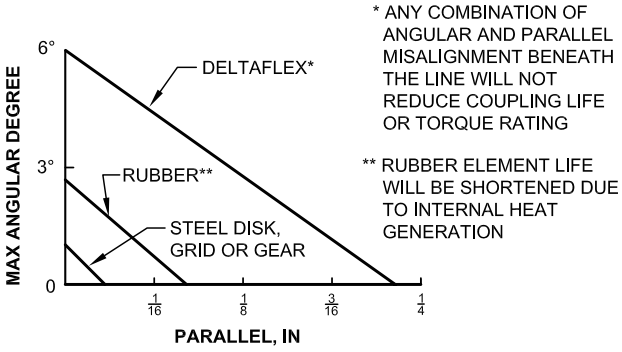
Graph A



Graph B



Graph C



(See illustrations B & C on the previous page for specific sizes)

Graph D

Deltaflex Coupling Design

The Deltaflex Difference

In contrast to most conventional coupling designs (see illustration D), the patented Deltaflex coupling is typically arranged in this manner: a hub, a flex-link at each end of a torque sleeve, and a hub (see illustration E). While most conventional coupling designs use a central flexing element, the Deltaflex uses two, making it a double engaging coupling. The patented concept, along with the method of connecting the hubs to the flexible links, permits the tremendous misalignment capabilities without exerting harmful radial loads.

Deltaflex

The Deltaflex coupling consists of four major components: two delta hubs, an inner flange, and an outer flange. The flex-links, as well as the delta mounting plates, are integral to each flange and are factory assembled. The hub is field-assembled to the flange with three axial cap screws. The two flanges are fastened together radially as the two coupling halves are joined to make a complete coupling.

In understanding the design of the Deltaflex it is important to note that the inner and outer flanges, once firmly fastened together with three cap screws, become a rigid "torque sleeve." The flex links at each end of the torque sleeve accommodate the misalignment generated by the equipment shaft hubs.

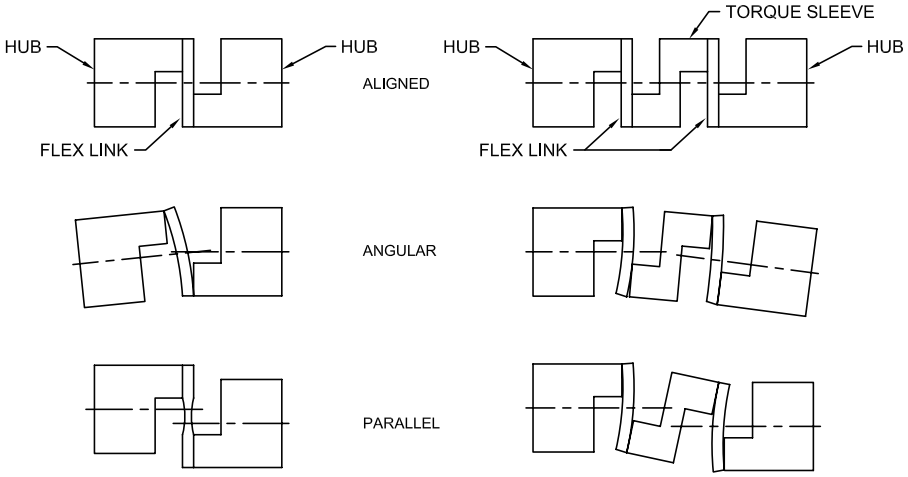


Illustration D
Conventional Coupling

Illustration E
Deltaflex Coupling

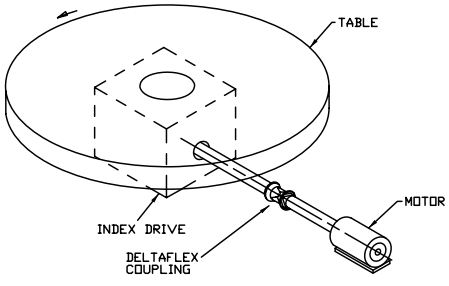
Typical Deltaflex Applications

Use Deltaflex couplings to simplify installation and minimize fabrication costs of structural frames. With the large misalignment capability of Deltaflex, extremely close tolerances will be unnecessary. Typical applications include: compressors, pumps, fans, mixers (vertical and horizontal), turbine drives, wind tunnels, and single bearing generator drives. Some other applications include:

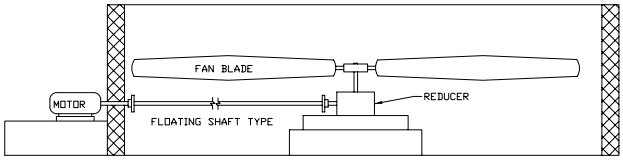
Drive-Line – Connecting long shaft lines with Deltaflex takes advantage of angular and parallel misalignment capabilities. Permits ease of installation and reduces radial bearing loads to a minimum.

Indexing Table or Work Positioning Drive – Takes advantage of zero backlash, instant response and constant velocity. Coupling may be between drive motor and gear reduction or on output side of reducer.

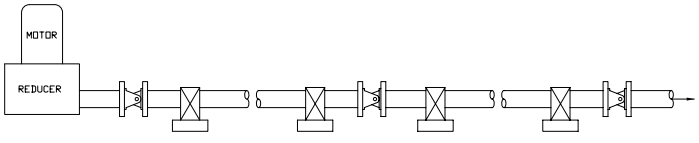
Cooling Tower Drive – The Deltaflex floating shaft coupling permits greater ease of installation with its generous axial misalignment capabilities. Also available in stainless steel.



Indexing Table



Cooling Tower Drive



Drive-Line

SP

Deltaflex Coupling Types

The unique design, misalignment capability and simple installation methods make Deltaflex easily adaptable to special applications. Contact Lovejoy Engineering for assistance.

Type 1

Shaft to Shaft – Hubs Mounted Internally

This is the standard arrangement for most shaft to shaft applications. There are five basic coupling sizes in all types, each with a Standard and a High Torque (HT) Series. Both the Standard and the HT Series are dimensionally interchangeable.

Type 1 Arrangement

Type 2

Shaft to Shaft – Hubs Mounted Externally

This arrangement is similar to Type 1 in that all components are the same, except the delta hubs are mounted outside the flanges.

Type 2 Arrangement

Type 2A

Shaft to Shaft – One Hub Mounted Externally,

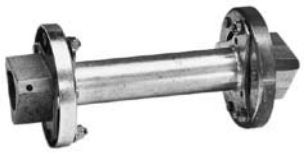
This arrangement uses the same components as the Type 2, but with one hub mounted on the inside of the flange and one hub mounted on the outside.

Type 2A Arrangement

Type 3

Spacer Type

This arrangement is specifically designed for the pump industry. It is available in a variety of industry standard shaft separations. The shaft center spacer drops out to facilitate easier maintenance of pump parts without disturbing the alignment of pump and motor.



Type 3 Arrangement

Type 4

Floating Shaft Type

Type 4 coupling components are the same as Type 3, except that the floating shaft design uses a longer spacer tube to span distances up to 12 feet. Deltaflex floating shaft couplings are light weight, dynamically balanced (as required) and corrosion resistant, which makes them ideal for applications in cooling towers and petrochemical service.

Type 4 Arrangement

Steps In Selecting A Deltaflex Coupling

Step 1: Determine the proper service factor (SF) for the application. This may involve 2 steps:

A. Driven equipment service factor (SFa): Using the Application Service Factors Chart 1 (page SP-10) select the service factor which best corresponds to your application. If the application is not listed in Chart 1, use Chart 2.

B. When using Chart 1, add the following service factors (SFb) to the values in Chart 1 as required. Add 0.5 for above average torque load variations or start/stop conditions of not more than once per hour. Add 1.0 for reversing loads, start/stop conditions more than once per hour, severe torque load variations or high inertia starting conditions.

The additional service factor is added to the Chart 1 service factors to obtain the total service factor.

$$SF = SFa + SFb$$

Step 2: Calculate the equivalent HP/100 RPM.

$$HP/100\ RPM = \frac{HP^* \times 100 \times SF}{RPM^*}$$

* HP and RPM of prime mover.

Step 3: Select the Deltaflex size.

Method 1: From the Deltaflex HP and Torque Ratings Chart 3 (page SP-11) select the smallest coupling which is rated equal to or higher than the calculated HP/100 RPM.

Method 2: For couplings driven by standard electric motors, you can multiply the HP of the motor by the service factor (SF) and then refer to the electric motor driven chart for selection.

Step 4: Determine the type of Deltaflex needed, e.g., Type 1, Type 2, etc.

Step 5: Check limiting conditions.

A. Check to be sure that the coupling's Peak Overload Torque Rating is sufficient to accommodate the maximum torque to be transmitted, such as the starting and stall torques of the motor, braking torques and cyclic peak torques, if any. If starting or braking cycles are frequent, the brake torque should be checked against the maximum continuous torque rating of the coupling.

$$T = Tp \times SF$$

T = Maximum torque transmitted
Tp = Brake torque, starting torque or peak torque
SF = Service Factor (determined previously)

B. Check the maximum hub bore. If bore size is too large, the next larger size Deltaflex can be specified.

C. Check other dimensions such as the limits on shaft separation, hub spacings, space required for the coupling, etc.

D. Check maximum speed. If operating speed exceeds 60% of listed maximum speed, the coupling should be dynamically balanced.

Step 6. Ordering Information.

A. Quantity, size, style of couplings.
B. Bore and Keyway sizes.
C. Dynamic balancing specification, if required.
D. Additional non-standard data.
1) Custom mounting dimensions
2) Between shaft ends (BE) dimension for spacer and floating shaft types
3) Maximum operating speed for floating shaft couplings

Selection Examples

A centrifugal fan requires 20 HP, 1,150 RPM motor, direct coupled from the motor to the fan. The motor frame is 286T (1.875 inch shaft) and the fan shaft is 1.625 inches.

Step 1: Using the Application Service Factors Chart 1 (page SP-10), the driven equipment service factor for a centrifugal fan is 1.5 = SFa. The load is uniform and the driver is smooth, therefore SFb is 0.

The total service factor SF is 1.5 + 0 = 1.5

Step 2: $$HP/100\ RPM = \frac{20 \times 100 \times 1.5}{1{,}150} = 2.6\ HP/100\ RPM$$

Using the Deltaflex HP and torque ratings Chart 3 (page SP-11), under the column of HP/100RPM, the smallest coupling you can select is #50 which is rated for 3.0 HP/100 RPM.

NOTE: You can also find the coupling size by multiplying SF x 20:

SF x 20 = 1.5 x 20 = 30 HP

In Chart 3 (page SP-11) for motor drives the coupling to select is, again, #50 under 1,150 RPM motors. The size is rated at 34 HP @ 1,150 RPM.

Step 3: In this case, the maximum bore for size #50 coupling is 1.875 inches; therefore, the selection size stands.

Step 4: Since this is a shaft-to-shaft application, you will be using the standard Deltaflex coupling Type 1. Determine if any other selection factors apply as described in steps 4 and 5 of the selection guide.

Floating Shaft Type Coupling Selection Example

Using the preceding data, assume that the shaft spacing from end of shaft to end of shaft is 36 inches. A floating shaft coupling is then required. The 36 inch is specified as BE (Between Ends) = 36 inches.

Refer to the Type 3 and 4 Chart (page SP-14) to find the overall length of the coupling; add dimension 2 x LTB to BE.

For a size #50 type 3, the overall length will be 36 inches + 2 x 1.69 = 39.38. Note that the length of the spacer tube assembly will be 36 inches - 2R = 36 - 1.62 = 34.38.

This is the amount of space, or dropout section, between the fixed portions of the coupling.

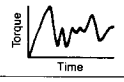
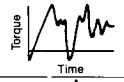
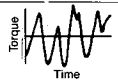
SP

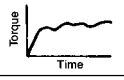
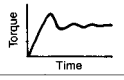
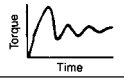
Application Service Factors — *Chart 1*

Agitators	
Liquids	2.0
Variable Density	3.0
Blowers	
Centrifugal	1.5
Lobe	2.0
Vane	2.0
Car Dumpers	3.0
Car Pullers	2.0
Clay Working Machinery	2.5
Compressors	
Centrifugal	1.5
Lobe, Vane, Screw	2.0
Reciprocating—	
Multi-cylinder	Not Recommended
Conveyors—Uniformly Loaded Or Fed	2.0
Conveyors—Heavy Duty	
Not Uniformly Fed	2.5
Conveyors—Vibratory	3.5
Cranes and Hoists	Not Recommended
Crushers	4.0
Extruders	
Plastic	2.0
Metal	2.5
Fans	
Centrifugal	1.5
Axial	1.5
Mine Ventilation	3.5
Cooling Towers	3.0
Light Duty Blowers & Fans	1.5
Feeders	
Light Duty	1.5
Heavy Duty	2.5
Food Industry	
Cereal Cooker	1.5
Dough Mixer	2.5
Meat Grinder	2.5
Can Filling Machine	1.5
Bottling	1.5
Generators	
Non-Welding	2.5
Welding	4.0
Hammer Mills	4.0
Lumber Industry	
Barkers—Drum Type	4.0
Edgar Feed	3.0
Live Rolls	3.0
Log Haul—Incline	3.0
Log Haul—Well Type	3.0
Planer Feed Chains	3.0
Planer Floor Chains	3.0
Planer Tilting Hoist	3.0
Slab Conveyor	2.5
Sorting Table	2.5
Trimmer Feed	3.0
Machine Tools	
Bending Roll	3.0
Punch Press—Gear Driven	3.0
Tapping Machines	4.0
Auxiliary Drives	2.5
Metal Mills	
Draw Bench—Carriage	3.5
Draw Bench—Main Drive	3.5
Forming Machines	3.5
Slitters	3.0
Table Conveyors	
Non-Reversing	3.5
Reversing	4.0
Wire Drawing & Flattening Machine	3.0
Wire Winding Machine	3.0
Mills, Rotary Type	
Ball	3.5
Cement Kilns	3.0
Dryers & Coolers	3.0
Kilns	3.0
Pebble	3.0
Rod	3.0
Tumbling Barrels	3.0
Mixers	
Concrete Mixers	3.0
Drum Type	3.0
Oil Industry	
Chillers	2.5
Oil Well Pumping	3.0
Rotary Kilns	3.0
Paper Mills	
Barker Auxiliaries, Hydraulic	4.0
Barker Mechanical	4.0
Barker Drum (Spur Gear Only)	4.0
Beater & Pulper	3.0
Bleacher	2.5
Calenders	3.0
Cylinders	3.0
Dryers	3.0
Jordans	3.0
Log Haul	3.0
Presses	3.0
Suction Roll	3.0
Washers and Thickeners	2.5
Winders	3.0
Printing Presses	2.5
Pumps	
Centrifugal	
General Duty (Liquid)	1.5
Boiler Feed	1.5
Slurry (Sewage, etc.)	2.5
Dredge	3.0
Reciprocating	
Double Acting	Not Recommended
Single Acting	Not Recommended
Rotary—Gear, Lobe, Vane	2.0
Rubber Industry	
Mixer—Banbury	4.0
Rubber Calender	3.0
Rubber Mill (2 or more)	3.5
Sheeter	3.0
Tire Building Machines	3.5
Tubers and Strainers	3.0
Screens	
Rotary—Stone or Gravel	2.5
Traveling Water Intake	2.5
Vibratory	3.5
Sewage Disposal Equipment	2.5
Textile Industry	
Batchers	2.5
Calenders	3.0
Card Machines	2.5
Dry Cans	3.0
Dryers	2.5
Dyeing Machinery	2.5
Looms	2.5
Mangles	2.5
Soapers	2.5
Spinners	2.5
Windlass	3.0

Notes: ■ Typical Service Factors Electric Motor and Turbine Driven Equipment.
■ If people are transported, Lovejoy does not recommend and will not warranty the use of the coupling.

Service Factors for Driven Equipment Load Classifications — *Chart 2*

Load Characteristics	Service Factors
 Shock loads and above average torque load variations, or start/stop applications of up to once per hour.	3.0
 Heavy shock loads reversing or start/stop applications of more than once per hour or high inertia starting loads.	4.0
 Heavy reversing torque loads. NOT RECOMMENDED. BECAUSE OF LOAD CARRYING METHOD IN FLEXIBLE LINKS	*NR

Load Characteristics	Service Factors
 Relatively low inertia, smooth continuous torque load.	1.5
 Torque load varies during operation of the equipment.	2.0
 Above average torque load variations during operation of the equipment.	2.5

*Torque load reversal can exist without reversing rotation and can be caused by overrunning the load with inertia or shifting of the load. Consult Lovejoy Engineering.

Note: ■ * indicates: Torque load reversal can exist without reversing rotation and can be caused by overrunning the load with inertia or shifting of the load. Consult Lovejoy Engineering.

SP

Deltaflex HP and Torque Ratings ***Chart 3***

	Max Bore				Maximum Continuous Torque		Peak Overload Torque		HP/100 RPM	HP Rating[1] @ Standard Motor RPM			
	Delta Hub		Round Hub										
Size	in	mm	in	mm	in-lbs	Nm	in-lbs	Nm	HP	875	1,150	1,750	3,500
40	1.38	35	1.63	42	750	84	1,125	127	1.2	10.5	13.8	21.0	42
40HT	1.38	35	1.63	42	1,260	142	1,890	213	2.0	17.5	23.0	35.0	70
50	1.88	50	2.25	58	1,900	214	2,850	322	3.0	26.2	34.0	52.4	105
50HT	1.88	50	2.25	58	2,835	320	4,235	478	4.5	39.0	52.0	78.0	156
60	2.50	66	3.00	81	4,100	463	6,150	695	6.5	57.0	75.0	114.0	228
60HT	2.50	66	3.00	81	6,000	678	9,000	1 017	9.5	83.0	109.0	166.0	332
80	3.38	93	4.00	110	9,500	1 073	14,250	1 610	15.0	131.0	173.0	262.0	524
80HT	3.38	93	4.00	110	15,000	1 695	22,500	2 542	23.8	208.0	274.0	416.0	832
100	4.25	114	5.00	136	22,900	2 587	34,500	3 898	36.3	317.0	418.0	634.0	1,268
100HT	4.25	114	5.00	136	33,000	3 728	49,500	5 593	52.4	458.0	603.0	916.0	1,832

Note: ■ 1 indicates: The HP ratings listed are for drives with a Service Factor of 1.0. Refer to Chart 1 (page SP-10) for Application Service Factors. Further, the ratings are based on prime movers such as electric motors or turbines.

$$HP/100RPM = \frac{HP \times 100}{RPM}$$

$$T(Torque) = \frac{HP \times 63{,}025}{RPM}$$

$$HP = \frac{Tx\ RPM}{63{,}025}$$

Note: ■ Internal Combustion Engines: Deltaflex couplings are not recommended for direct connection to internal combustion engine drives.

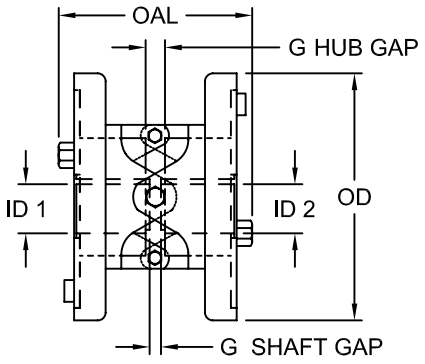
SP

Type 1

Shaft to Shaft – Hubs Mounted Internally

This is the standard arrangement for most shaft to shaft applications. There are five basic coupling sizes in all types, each with a Standard and a High Torque (HT) Series. Both the Standard and the HT Series are dimensionally interchangeable.

Type 1 features the standard inner and outer flanges and delta hubs, which are triangular in shape to accommodate the delta flex-link pattern. The standard flanges are stamped steel, while the flex links in all Deltaflex couplings are precipitation-hardened (PH 17-7) stainless steel. Delta hubs are ductile iron, zinc clear dichromate-plated and available from stock in a variety of bore sizes. Every Deltaflex hub is standard with two set screws at 120°. Hub to flange (axial) and flange to flange (radial) hardware is SAE Grade 5. Stainless steel flanges with standard ductile iron delta hubs are available from stock as an option. Delta style hubs are not available in stainless steel.



Deltaflex Type 1 Dimensional Data

Size	OAL	G Hub Gap	ID1 - ID2 Max Bore		ID1 - ID2 Min RSB[1]		G Shaft Gap	OD	HP/100 RPM	Max Continuous Torque		Peak Overload Torque[2]		Angular[3]	Parallel[3]	Axial Freedom[4]	Moment of Inertia WR²	Max
	in	in	in	mm	in	mm	in	in	HP	in-lbs	Nm	in-lbs	Nm				lbs-in²	RPM[5]
40	3.51	0.29	1.375	35	0.438	11	0.12	4.38	1.2	750	85	1,125	127	6°	0.12	0.09	5.4	8,000
40HT	3.54	0.32	1.375	35	0.438	11	0.12	4.38	2.0	1,260	142	1,890	214	5°	0.12	0.09	5.4	8,000
50	4.83	0.71	1.875	48	0.438	11	0.18	6.18	3.0	1,900	215	2,850	322	6°	0.18	0.12	30.1	6,000
50HT	4.87	0.75	1.875	48	0.438	11	0.18	6.18	4.5	2,835	320	4,235	479	5°	0.15	0.12	30.1	6,000
60	6.22	1.23	2.500	64	0.750	19	0.18	7.25	6.5	4,100	463	6,150	695	6°	0.24	0.15	64.3	5,000
60HT	6.26	1.27	2.500	64	0.750	19	0.18	7.25	9.5	6,000	678	9,000	1 017	5°	0.21	0.15	64.3	5,000
80	7.52	1.02	3.375	86	1.375	35	0.25	9.62	15.0	9,500	1 074	14,250	1 610	6°	0.29	0.18	297.0	4,000
80HT	7.57	1.07	3.375	86	1.375	35	0.25	9.62	23.8	15,000	1 695	22,500	2 543	5°	0.25	0.18	297.0	4,000
100	9.74	0.58	4.250	108	1.750	44	0.31	12.75	36.3	22,900	2 588	34,500	3 899	6°	0.40	0.25	884.0	3,000
100HT	9.82	0.66	4.250	108	1.750	44	0.31	12.75	52.4	33,000	3 729	49,500	5 594	5°	0.35	0.25	884.0	3,000

Notes:
- 1 indicates: RSB hubs are furnished with two set screws at 120°, no keyway.
- 2 indicates: Peak Overload Torque = Torque that can be applied for short periods, such as shock loads, start up, etc.
- 3 indicates: See illustrations B & C on page SP-5 for combined maximum misalignment.
- 4 indicates: Axial Freedom is provided only for the purpose of system expansion or due to temperature changes or shaft flotation (such as with sleeve bearing motors).
- 5 indicates: Balancing is not required below 60% of maximum RPM.

Type 2

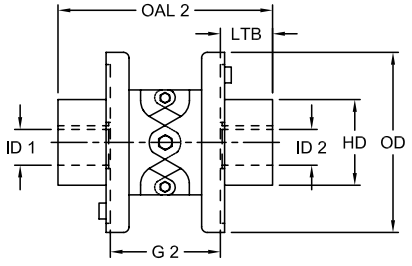
Shaft to Shaft – Hubs Mounted Externally

This arrangement is similar to Type 1 in that all components are the same, except the delta hubs are mounted outside the flanges. An optional version of the Type 2 uses round hubs mounted externally on both ends or on one end to accommodate larger bore requirements. Type 2 is available as a stock option with stainless steel flanges and stainless steel round hubs. Delta style hubs are not available in stainless steel.

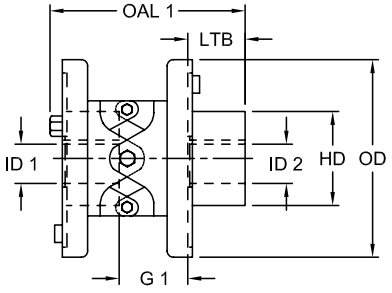
Type 2A

Shaft to Shaft – One Hub Mounted Externally, One Hub Mounted Internally

One hub is mounted on the inside of the flange and one hub is mounted on the outside. Round hubs cannot be mounted on the inside of the coupling. Type 2A is available as a stock option with stainless steel flanges. The internal hub would be ductile iron, while the external hub would be a stainless steel round hub. Delta hubs are not available in stainless steel.



Type 2



Type 2A

Deltaflex Type 2 and 2A Dimensional Data

Size	OAL1[2] in	OAL2[2] in	LTB in	ID1 - ID2 Max Bore Delta Hub in	mm	Round Hub in	mm	Min Bore[1] Delta Hub in	mm	G1[3] in	G2[3] in	OD in	HD in	HP/100 RPM HP	Max Cont Torque in-lbs	Nm	Peak Overlaod Torque in-lbs	Nm	Max RPM
40	4.51	5.51	1.23	1.375	35	1.625	41	0.438	11	1.67	3.05	4.38	2.56	1.2	750	85	1,125	127	8,000
40HT	4.54	5.54	1.23	1.375	35	1.625	41	0.438	11	1.70	3.08	4.38	2.56	2.0	1,260	142	1,890	214	8,000
50	6.10	7.37	1.57	1.875	48	2.250	57	0.438	11	2.47	4.23	6.18	3.56	3.0	1,900	215	2,850	322	6,000
50HT	6.14	7.41	1.57	1.875	48	2.250	57	0.438	11	2.51	4.27	6.18	3.56	4.5	2,835	320	4,235	479	6,000
60	7.77	9.33	1.90	2.500	64	3.000	76	0.750	19	3.38	5.53	7.25	4.50	6.5	4,100	463	6,250	706	5,000
60HT	7.82	9.37	1.90	2.500	64	3.000	76	0.750	19	3.42	5.57	7.25	4.50	9.5	6,000	678	9,000	1 017	5,000
80	9.58	11.64	2.53	3.375	86	4.000	102	1.375	35	3.80	6.58	9.62	5.88	15.0	9,500	1 074	14,250	1 610	4,000
80HT	9.63	11.69	2.53	3.375	86	4.000	102	1.375	35	3.85	6.63	9.62	5.88	23.8	15,000	1 695	22,500	2 543	4,000
100	12.91	16.08	3.75	4.250	108	5.000	127	1.750	44	4.58	8.58	12.75	7.25	36.3	22,900	2 588	34,500	3 899	3,000
100HT	12.99	16.16	3.75	4.250	108	5.000	127	1.750	44	4.66	8.66	12.75	7.25	52.4	33,000	3 729	49,500	5 594	3,000

Notes:
- 1 indicates: Minimum Bore hubs are furnished with two set screws at 120°, no keyway.
- 2 indicates: OAL1 is overall length with one hub mounted externally; OAL2 is with both hubs mounted externally.
- 3 indicates: G1 is hub gap with one hub mounted externally; G2 is with both hubs mounted externally.
- For misalignment capabilities, see illustrations B and C on page SP-5, or Type 1 data on previous page. See page SP-11 for Performance Data.

SP

Type 3
Spacer Type

This arrangement is specifically designed for the pump industry and is available in a variety of industry standard shaft separations. The shaft center spacer drops out to facilitate easier maintenance of pump parts without disturbing the alignment of pump and motor. Spacer type couplings utilize either standard delta hubs or optional round hubs. The center member of the Deltaflex is captured by the construction of the spacer flanges for greater safety. Standard spacer drop out lengths are available to accommodate shaft separations of 3.50, 4.38, 5, 7, 10, 12 and 15 inches. Special spacer lengths and stainless steel spacer couplings are available as an option.

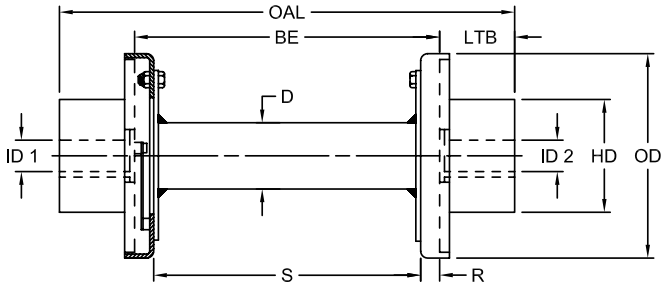
Type 4
Floating Shaft Type

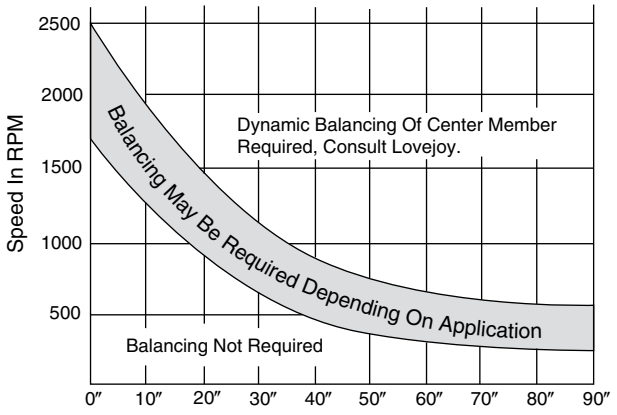
The Type 4 coupling components are identical to Type 3, except the floating shaft design uses a longer spacer tube to span distances up to 12 feet. Deltaflex floating shaft couplings are lightweight, dynamically balanced (as required) and corrosion resistant. The center member of the Deltaflex is captured by the construction of the spacer flanges for greater safety. Floating shaft couplings are also available in stainless steel. See next page for dimensions.

Deltaflex Floating Shaft Maximum Parallel Misalignment

Size	Dimensions in Inches at Max Span @ RPM 1750
40	2.50
40HT	2.00
50	3.00
50HT	2.50
60	3.25
60HT	3.00
80	4.00
80HT	3.50
100	4.25
100HT	4.00

Type 3 and 4 – Spacer and Floating Shaft





Floating Shaft Couplings Balancing Requirements

Deltaflex Type 3 and 4 Dimensional Data

Size	OAL in	BE in	LTB[4] in	D in	ID1 - ID2 Min Bore[1] Delta Hub in	mm	Max Bore Delta Hub in	mm	Max Bore Round Hub in	mm	S[3] in	R in	OD in	HD in	HP/100 RPM HP	Max Cont Torque in-lbs	Nm	Peak Overload Torque in-lbs	Nm
40	See Type 3 on SP-15	See Type 3 on SP-15	1.34	1.50	0.438	11	1.375	35	1.625	41	See Type 3 on SP-15	0.50	4.38	2.56	1.2	750	85	1,125	127
40HT			1.34	1.50	0.438	11	1.375	35	1.625	41		0.50	4.38	2.56	2.0	1,260	142	1,890	213
50			1.68	2.00	0.438	11	1.875	48	2.250	57		0.81	6.18	3.56	3.0	1,900	215	2,850	322
50HT			1.68	2.00	0.438	11	1.875	48	2.250	57		0.81	6.18	3.56	4.5	2,835	320	4,235	478
60			2.03	2.62	0.750	19	2.500	64	3.000	76		0.94	7.25	4.50	6.5	4,100	463	6,250	695
60HT			2.03	2.62	0.750	19	2.500	64	3.000	76		0.94	7.25	4.50	9.5	6,000	678	9,000	1 017
80			2.66	3.50	1.375	35	3.375	86	4.000	102		1.00	9.62	5.88	15.0	9,500	1 074	14,250	1 610
80HT			2.66	3.50	1.375	35	3.375	86	4.000	102		1.00	9.62	5.88	23.8	15,000	1 695	22,500	2 543
100			3.88	4.38	1.750	44	4.250	108	5.000	127		1.25	12.75	7.25	36.3	22,900	2 588	34,500	3 899
100HT			3.88	4.38	1.750	44	4.250	108	5.000	127		1.25	12.75	7.25	52.4	33,000	3 729	49,500	5 594

Notes:
- 1 indicates: Minimum bore hubs are furnished with 2 set screws at 120°, no keyway.
- 3 indicates: S is the Spacer drop out or floating shaft length, S = BE-2(R).
- 4 indicates: LTB is the length through the hub bore. OAL is the overall length, OAL = BE + 2(LTB).
- BE is the distance between the ends of equipment shafts—please supply this dimension when placing orders, BE = OAL-2 (LTB), BE = S + 2 (R), BE < 18 inch = Spacer coupling (Type 3); BE > 18 inch = Floating Shaft coupling (Type 4).

Deltaflex Type 3 Additional Dimensional Data

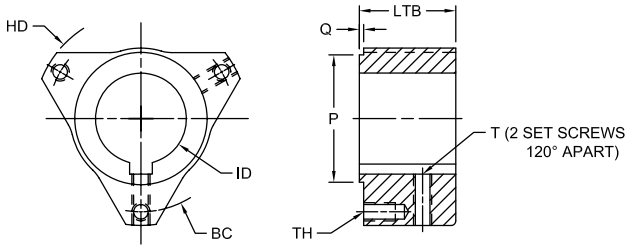
Size	OAL		BE		S	
	in	mm	in	mm	in	mm
40/40HT	6.16	156	3.50	89	2.50	64
	7.03	179	4.38	111	3.38	86
	7.66	194	5.00	127	4.00	102
50/50HT	7.72	196	4.38	111	2.75	70
	8.34	212	5.00	127	3.38	86
	10.34	263	7.00	178	5.38	137
60/60HT	9.06	230	5.00	127	3.12	82
	11.06	281	7.00	178	5.12	130
	14.06	357	10.00	254	8.12	206
80/80HT	15.31	389	10.00	254	8.16	207
	17.31	440	12.00	305	10.16	258
100/100HT	19.75	502	12.00	305	9.50	241
	22.75	578	15.00	381	12.50	318

Deltaflex Type 4 Floating Shaft Coupling Maximum Span-Inch

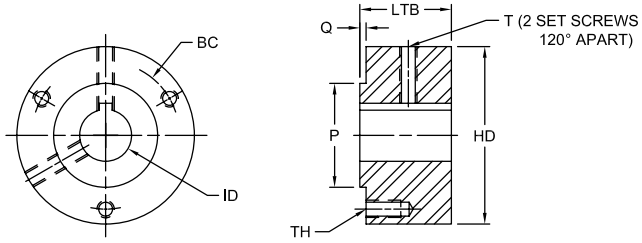
Size	Max Span-BE		
	1750 RPM	1150 RPM	875 RPM
40/40HT	60	76	88
50/50HT	70	88	102
60/60HT	80	100	114
80/80HT	94	115	140
100/100HT	104	120	150

Note: ■ Consult Lovejoy Engineering for other RPM/Span applications.

SP



Delta Hub



Round Hub

Deltaflex Delta and Round Hub Dimensional Data

Size	HD	ID						BC	LTB	Q	P	T	TH
		Min Bore[1] Delta Hub		Max Bore Delta Hub		Max Bore Round Hub						Set Screw	Axial Cap Screw Tap
	in	in	mm	in	mm	in	mm	in	in	in	in	in	in
40/40HT	2.56	0.438	11	1.375	35	1.625	41	2.12	1.34	0.09	1.498/1.500	1/4-20	1/4-20 x .62
50/50HT	3.56	0.438	11	1.875	48	2.250	57	3.08	1.68	0.09	1.998/2.000	1/4-20*	5/16- 18 x .75
60/60HT	4.50	0.750	19	2.500	64	3.000	76	3.88	2.03	0.12	2.623/2.625	3/8-16	3/8- 16 x .88
80/80HT	5.88	1.375	35	3.375	86	4.000	102	5.12	2.66	0.12	3.498/3.500	1/2-13	1/2- 13 x 1.00
100/100HT	7.25	1.750	44	4.250	108	5.000	127	6.32	3.88	0.12	4.373/4.375	1/2-13	5/8- 11 x 1.50

Notes:
- * indicates: In some bore sizes the tap is 5/8-18.
- Maximum bores are provided with standard keyway. RSB hubs do not have a keyway. Both Delta hubs and Round hubs are provided with two set screws at 120°.

Deltaflex Standard Bore Availability Chart

Size	0.438	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875	2.000
40/40HT	D	S	S	S	S	S	S	S	R	R	N/A	N/A	N/A
50/50HT	D	S	S	S	S	S	S	S	S	S	S	S	R
60/60HT	N/A	N/A	D	S	S	S	S	S	S	S	S	S	S
80/80HT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	N/A	S	S	S	S
100/100HT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	S	S

Size	2.125	2.250	2.375	2.500	2.625	2.750	2.875	3.000	3.125	3.250	3.375	3.500
50/50HT	R	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60/60HT	S	S	S	S	R	R	R	R	N/A	N/A	N/A	N/A
80/80HT	S	S	S	S	S	S	S	S	S	S	S	S
100/100HT	S	S	S	S	S	S	S	S	S	S	S	S

Size	3.625	3.750	3.875	4.000	4.125	4.250	4.375	4.500	4.625	4.750	4.875	5.000
80/80HT	R	R	R	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100/100HT	S	S	S	S	S	S	R	R	R	R	R	R

Notes:
- S indicates: Standard hub, finished bores available from stock, two set screws @ 120° and standard keyway.
- R indicates: Round hub, finished bores available from stock, two set screws @ 120° and standard keyway.
- D indicates: Delta hubs, rough stock bores available from stock, two set screws @ 120°, no keyway.
- N/A indicates: Not Available.