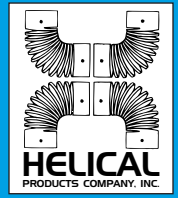


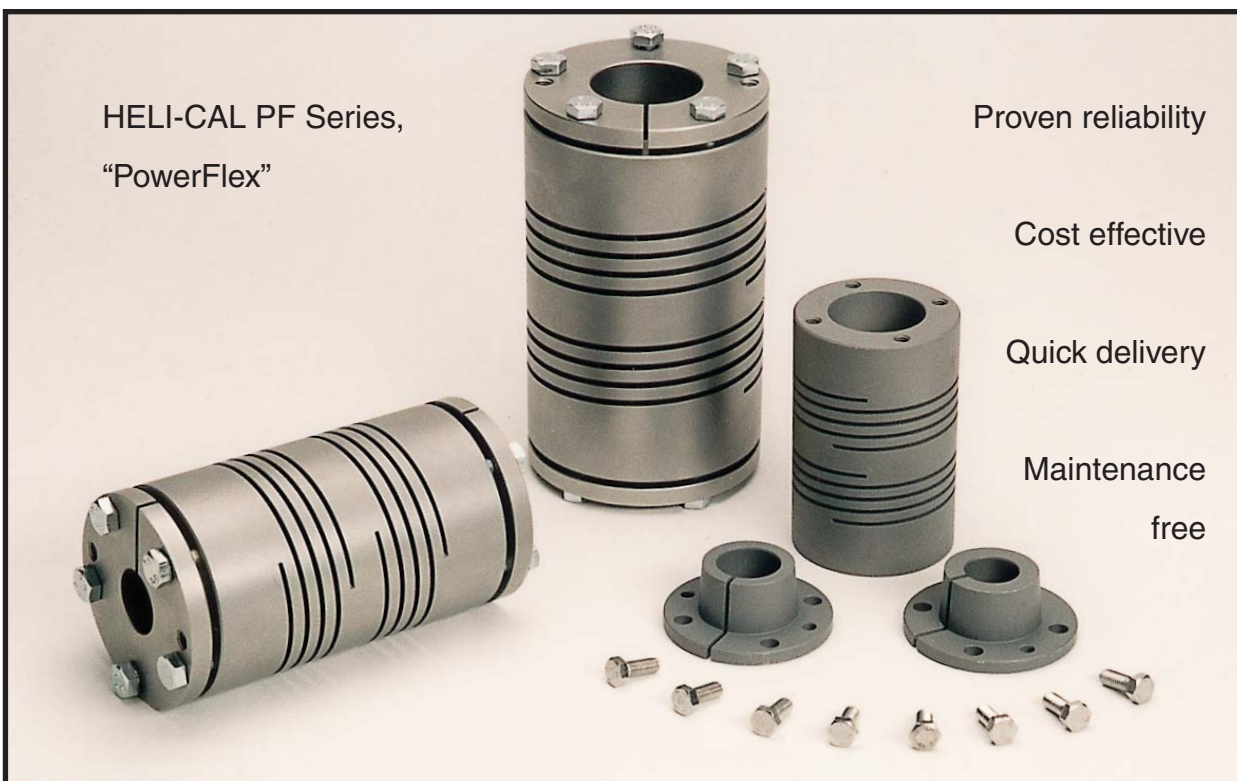
HELI-CAL NEWS



NUMBER 10

For 1/2 inch to 1 3/4 inch shaft sizes

Introducing Helical's New PF Series: "PowerFlex," a maintenance free, power transmission coupling.



HELI-CAL PF Series, "PowerFlex"

Proven reliability

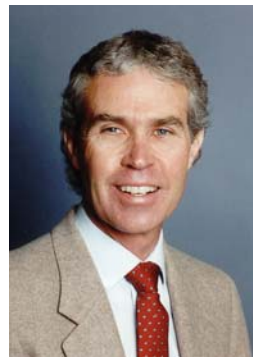
Cost effective

Quick delivery

Maintenance free

Designer's comments

By Norman Paul
Senior Helical
Design Engineer



The new PF (PowerFlex) Series of couplings is Helical's latest and best offering yet to the world of power transmission products. By incorporating features that make practical sense into this versatile, maintenance free coupling, Helical Products Company is now able to compete head-on in a highly competitive marketplace with a product that will perform superbly in customer applications.

The PowerFlex is essentially a very cost effective coupling, the benefits of which include no lubrication, no maintenance, no keyway requirements and zero backlash. Plus, the product provides more torque for less money than past Helical power transmission coupling offerings of the same size range.

Four key elements have been incorporated to create the PowerFlex: the HELI-CAL Flexure, the convenience of removable tapered bushings, high torque capacity (up to 1800 lbin), and substantial misalignment capability.

Early on in the PowerFlex design process, it was recognized that the time tested and proven HELI-CAL Flexure should be utilized as the key coupling component. The HELI-CAL Flexure is a flexible helix (curved) beam machined from one piece of material into a specific configuration that incorporates special design requirements, performance features and characteristics. Use of the "Flexure" simplifies the manufacturing process, lowers production costs and reduces lead times, which means faster delivery and lower prices.

After reviewing various combinations of coil thickness, number of coils, number of "starts" and flexure ID's, we arrived at a double start HELI-CAL Flexure configuration that accommodates sizable misalignments, and provides substantial torque capability, high torsional stiffness, and reasonable pricing. This represents value for the customer, which is always a key goal when we develop a new series of couplings.

This innovative design provides a flexible shaft coupling that can compensate for many operational variables, such as parallel offset and angular misalignment present anytime two shafts are being attached. The PowerFlex's unique flexing element also accommodates axial motion between two shafts.

The PowerFlex is available in anodized aluminum and stainless steel. Shaft sizes range from .50 to 1.75 inch diameter. Maximum torque ratings go from 250 lbin for the 2.0 inch OD aluminum to 1800 lbin for the 3.0 inch OD stainless steel coupling. Maximum torque values are divided by a service factor to determine the proper coupling for a given application.

continued on next page

Helical's PF Series, PowerFlex, means more torque for less money

Selection chart for maintenance free, HELI-CAL PF Series (PowerFlex) flexible couplings

STANDARD BORE DIAMETER +.002 / -.000 in (+0.05 / -.00 mm)			PERFORMANCE DATA			PART NUMBER	DIMENSIONAL INFORMATION				ATTACHMENT SCREW		WEIGHT lb (kg)	
Max w/RELIEF see note 1 in (mm)	Max w/STEP BORE see note 2 in (mm)	Min in (mm)	Momentary Dynamic Torque see note 3 lbin (Nm)	Torsional Stiffness lbin/rad (Nm/rad)	Parallel Offset in (mm)		OD in (mm)	L in (mm)	L1 in (mm)	B in (mm)	Size	Qty		Seating Torque lbin (Nm)
.875 (22.00)	1.000 (25.00)	.500 (12.00)	250 (28)	2,150 (243)	.025 (.65)	PFA200	2.00 (50.8)	4.00 (101.6)	3.12 (79.2)	.82 (20.8)	M5	4	55 (6.2)	0.87 (.39)
			530 (60)	5,940 (672)	.025 (.65)								PFS200	65 (7.3)
1.125 (28.00)	1.375 (35.00)	.500 (12.00)	480 (55)	4,070 (460)	.030 (.75)	PFA250	2.50 (63.5)	4.75 (120.7)	3.70 (94.0)	1.00 (25.4)	M6	5	90 (10)	1.68 (.76)
			1,025 (115)	11,270 (1,273)	.030 (.75)								PFS250	110 (12)
1.375 (35.00)	1.750 (44.00)	.625 (16.00)	840 (95)	7,060 (797)	.035 (.85)	PFA300	3.00 (76.2)	5.50 (139.7)	4.47 (113.5)	1.13 (28.7)	M6	5	90 (10)	2.70 (1.22)
			1,800 (205)	19,530 (2,207)	.035 (.85)								PFS300	110 (12)

Lightly shaded boxes indicate stainless steel (CRES)

Angular: 4 degrees Axial: +/- .020in (.50mm) Max. RPM: 6,000

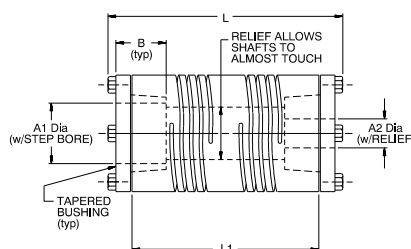
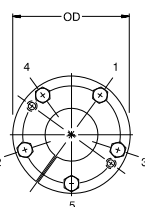
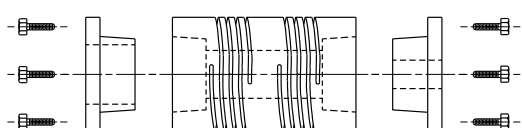
Conversion from Horsepower to Torque: (HP x 63,000) ÷ RPM = Trq (lbin) or (HP x 7,119) ÷ RPM = Trq (Nm)

- Note 1 Shaft sizes less than or equal to the Max w/RELIEF can penetrate to the center of the coupling. See drawing.
 Note 2 Shaft sizes greater than the Max w/RELIEF up to the Max w/STEP BORE can only penetrate to the B dimension. See drawing.
 Note 3 Dynamic torque ratings are momentary values. For non-reversing applications, divide by 2. Divide by 4 for reversing applications. Should the torque ratings be marginal for your application, contact us for analysis.

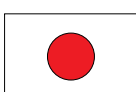
The PF Series (PowerFlex) power transmission coupling uses the proven HELI-CAL Flexure to provide reliable torque transmission between shafts, while allowing for substantial angular and parallel misalignment compensation. The PF Series also incorporates the convenience of interchangeable bushings, providing for quick and easy changes in bore sizes, while using the same HELI-CAL FLEXIBLE COUPLING center section. This means both fast initial delivery (separate bushings and center section are assembled for shipment from inventory), and the ability to change the coupling's bore sizes without remachining when the coupling is already in use (just order new bushings precision bored to your needs).
 The relief feature allows the shafts to penetrate into the Flexure area. With step bores, the shafts are inserted into the tapered bushings only, to dimension B.
 To make things even simpler, the need for keyways has been eliminated. By designing the tapered bushings to hold more torque than the maximum torque capacity of the coupling, sizing and placement of keyways is no longer an issue. The PF Series is available in both aluminum and corrosion resistant steel (CRES).

Attachment: Tapered bushing
Materials: PFA: 7075-T6 Aluminum alloy center-section and bushings
 PFS: 15-5 PH H900 CRES center section 303 CRES bushings

M6.0 Hex Head Cap Screw
5 places
(M5.0 Hex Head Cap Screw
4 places on PFA/PFS 200)



*Seating of screws: For correct installation, progressively tighten screws to specified torque in sequence shown above.



FANTASTIC “FLEXURE FACTS”

The versatility of the HELI-CAL Flexure is the “secret ingredient” in each design engineering application. You’ll see how the flexibility of the HELI-CAL Flexure means unprecedented design opportunities for you.



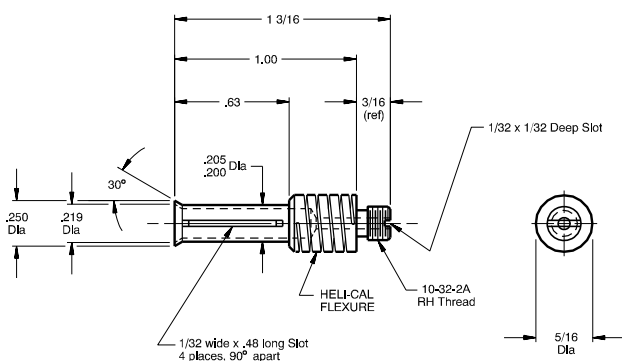
SOLVED APPLICATION STORY 25

CHALLENGE: A manufacturer of xenon flash lamps found the lamps increased in length from the heat generated when the lamp was on. The company wanted the electrical connection to the lamp to have these features:

1. Compliant electrical connection to the lamp.
2. Compression compensation for thermal growth.
3. Threaded stud for electrical supply.
4. Corrosion resistant since water will be flowing over connection.

SOLUTION: The final machined spring design should be considered a premier example of Value Engineering. This concept encourages that a single item perform as many primary and secondary functions as possible; the more the better. The electrical connection for the lamp was accomplished by the slotted end receiver. The HELI-CAL Flexure was sized to provide the desired thermal growth compensation and not become a limiting resistive element since it is in the electrical current path. The threaded end addressed the electrical attachment requirement, and the whole item was manufactured from corrosion resistant 303 Stainless Steel.

ANSWER: HELI-CAL Precision “Machined” Spring # 228.



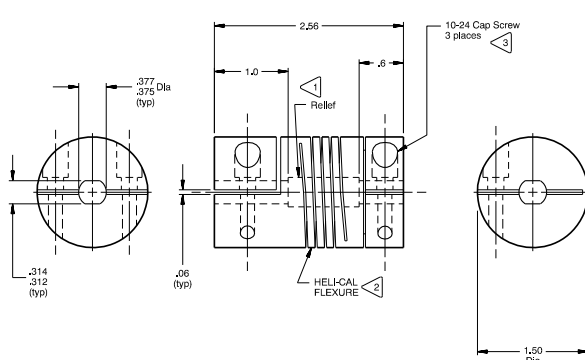
SOLVED APPLICATION STORY 38

CHALLENGE: Here is an example of a customer who was already using Helical’s flexible coupling. They were entering into the design stage of a new product and wanted to use a standard MCAC150. It met all of the primary requirements of the new product but it needed to be shorter. They later found, when disassembling the machine for maintenance purposes, one end was required to have a removable cap. To be assured that a positive drive was maintained, they asked that a double “D” bore be incorporated. This was a case where the customer wanted a standard coupling “except for...”

There was a second coupling used in another location. It was a standard coupling but also required a double “D” in place of the normal round quarter inch bore. Another “except for...”

SOLUTION: Each time a change request was made, Helical’s application engineer was able to meet the requirements and a sample coupling was sent for the customer to test and evaluate in the actual application. Being able to meet the specifications in a timely manner allowed Helical to supply the customer couplings for several years. There were 5 couplings of the smaller size and 1 of the larger size per machine.

ANSWER: HELI-CAL Flexible Shaft Couplings # 1270 and 1336.



continued from page one

The new couplings are configured with two flexing elements, each consisting of two curved beams spaced 180 degrees apart. Each curved beam is a spiral configuration that provides a beam long enough for good flexibility, but short enough to be torsionally stiff. This high torsional stiffness is exceedingly important in motion control systems where position accuracy is critical. Each double beam element can bend 2 degrees for a total of 4 degrees angular misalignment. The flexing elements are used in pairs to allow for parallel offset between two shafts (fig 1).

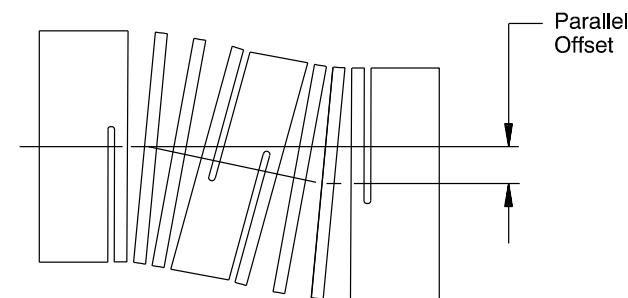


fig. 1

The double beam configuration of the PowerFlex provides a stability that makes it well suited for high rotational speed applications up to 6,000 RPM. Since all the flexing for misalignment is taken up by the beams, (made from a single piece of material), the PowerFlex is perfect for those troublesome power transmission applications. The single piece flexing element makes this coupling essentially maintenance free. Besides featuring high torsional stiffness, the PowerFlex is also backlash free, making it particularly well suited to high torque motion control applications. The PowerFlex offers considerable savings in maintenance costs (there are none) in applications where lubrication access is restricted or near impossible.

A tapered bushing attachment provides a positive method to hold the coupling to the shaft. The bushing’s taper angle is low enough to give good concentricity and torque transmission capacity yet high enough to release the bushings from the coupling easily. Installation is achieved by sliding the bushing up the shaft, and placing the coupling into position. The bushing is tightened by progressively torquing the hex head screws to the specified torque in a star pattern. This star pattern tightening sequence is then repeated on the other end to complete the installation. Since the holding capacity of the tapered bushing is more than the maximum torque capacity of the coupling, keyways are not necessary.

Removal of the PowerFlex is accomplished by removing the hex head screws from both ends. The tapered bushings are released from the coupling by threading two of the hex head screws into the threaded holes of the tapered bushing flange. By tightening the hex head screws the tapered bushing is pulled from the coupling and the friction taper attachment is released.

Because we machine precision bore sizes into the tapered bushings, PowerFlex couplings can be assembled quickly to suit customer needs and delivered fast. Customers also may make coupling bore size changes themselves.

The PowerFlex PF series is available in both inch and millimeter bore sizes in aluminum or stainless steel. Many sizes are available for immediate delivery.

The new PowerFlex power transmission flexible beam coupling from Helical may well be the answer for a wide range of motion control applications, particularly where designers want a coupling that is easy to use, is maintenance free, and has a very long life. ☐

“More Than A
Means To
Connect
Two Shafts”

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