LinkFlex

act in time

MECHATRONIC COMPONENTS & SOLUTIONS

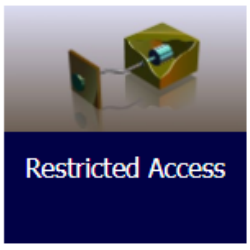
What are flexible shafts?

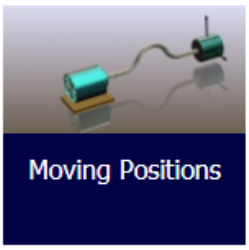
A flexible shaft transmits rotary motion much like a solid shaft. But, it can be routed over, under, and around obstacles that would make using a solid shaft impractical. A “Flexible Shaft Assembly” consists of a rotating shaft (sometimes called a core) with metal end fittings for attachment to mating parts. A protective outer casing is used when necessary. This casing has its own fittings (called ferrules) that keep it stationary during use.

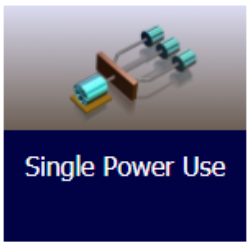
A flexible shaft is a highly effective means of transmitting rotary motion and is more efficient than universal joints, gears, sprockets and chains, or belts and pulleys. It is typically lower in cost than these other devices and offers the added benefit of compensating for misalignment’s in your system that can greatly reduce cost and assembly time.

Advantages of flexible shafts:

- **Eliminate alignment problems:** Flexible shafts have no need for the tight tolerance that solid shafts require.
- **Have Higher efficiency:** Flexible shafts are 90 %-95% efficient. Gears, U-joints, belts and pulleys have much lower efficiencies due to greater frictional losses.
- **Are Light weight and powerful:** Flexible shafts have a 3:1 weight advantage over other design solutions while transmitting greater power loads.
- **Reduced parts cost:** Bearings and housings for solid shafts and gears require precise machining operations. Flexible shafts eliminate the need for such demanding tolerance and their excessive costs.
- **Are Not affected by Vibration:** Vibrations do not affect flexible shafts performance.
- **Are Easy to Install:** No need for special installation tools
- **Provide Greater design freedom:** Limitless possibilities in position motor and driven components
- **Allow Large off-sets:** Flexible couplings allow only 5 degrees of off-set and U-Joints 30 degrees, but with a 40%-50% decline in efficiency. Flexible shafts permit a full 180 degree off-set while maintaining their high efficiency.
- **Have Lower installation cost:** Flexible shafts install in minutes without special tools or skills. Solid shafts, gears, pulleys, and universal joints require precise alignment and skilled mechanics for their installations.
- **Can Be Designed At The Latter Stages Of A Project:** Unlike other rotary motion devices that need to be designed around because of their rigidness, defined configurations, and large mass. Flexible Shafts allow greater design freedom since engineers have only one piece to work on, eliminating complex coordination of multiple pieces

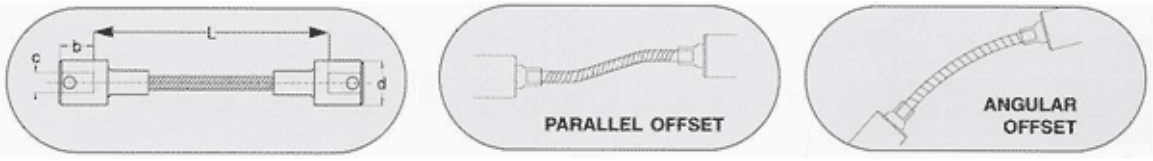






LinkFlex performance and dimensions:

LinkFlex is a basic flexible shaft that is suitable for connecting equipment over short distances, usually up to 300 mm due to the shaft not being stabilised. LinkFlex consists of two female couplings, one each end, joined to a length of flexible shaft to interface with driving and driven equipment.



The LinkFlex order code follows the following format.

LinkFlex Coding – LFXXYYY/ZA (sizes in mm)
LF = LinkFlex, XX = Shaft dia, YYY = Active length of shaft, ZA = Bore size (both ends)

LinkFlex Coding – LFXXYYY/ZA/ZB (sizes in mm)
LF = LinkFlex, XX = Shaft dia, YYY = Active length of shaft, ZA = Bore size (1st end) ZB = Bore size (2nd end)

Example: LF03040/03/04 = LinkFlex Ø3mm shaft, 40mm between couplings, Ø3mm bore 1st end, Ø4mm bore 2nd end.

NB length (L) given is to the bottom of the coupling recesses. (the length of the gap to be filled)
Overall length (O/L) is given for information.

Shaft Ø	Dim Part No.	O/L (mm)	L (mm)	b (mm)	c (mm)	d (mm)	Max Angular Offset (°)	Max Parallel Offset (mm)	Max Speed (rpm)	Max Torque (N.m)
03	LF 03010/--	49	33	8	3, 4 or 5	12	2.05°	0.35	8000	3.53
03	LF 03020/--	59	43	8	3, 4 or 5	12	4.00°	1.40	8000	2.26
03	LF 03030/--	69	53	8	3, 4 or 5	12	6.10°	3.20	8000	1.19
03	LF 03040/--	79	63	8	3, 4 or 5	12	8.15°	5.65	8000	0.85
04	LF 04020/--	63	47	8	4, 5 or 6	12	3.75°	1.25	8000	4.52
04	LF 04030/--	73	57	8	4, 5 or 6	12	5.50°	3.00	8000	2.37
04	LF 04040/--	83	67	8	4, 5 or 6	12	7.50°	5.30	8000	1.41
05	LF 05020/--	73	53	10	4, 5 or 6	14	3.25°	1.18	6000	1.36
05	LF 05030/--	83	63	10	4, 5 or 6	14	5.00°	2.60	6000	0.78
05	LF 05040/--	93	73	10	4, 5 or 6	14	6.70°	4.50	6000	0.64
05	LF 05050/--	103	83	10	4, 5 or 6	14	8.40°	7.30	6000	0.40
06	LF 06030/--	95	71	12	5, 6 or 8	16	4.30°	2.25	3600	1.99
06	LF 06040/--	105	81	12	5, 6 or 8	16	5.70°	4.00	3600	1.45
06	LF 06050/--	115	91	12	5, 6 or 8	16	7.16°	6.25	3600	1.00
06	LF 06075/--	140	116	12	5, 6 or 8	16	10.50°	13.90	3600	0.43
09	LF 09050/--	131	101	15	6, 8 or 10	23	7.15°	6.20	3600	4.33
09	LF 09075/--	156	126	15	6, 8 or 10	23	10.70°	13.75	3600	2.71
09	LF 09100/--	181	151	15	6, 8 or 10	23	14.30°	24.50	3600	1.79
09	LF 09125/--	206	176	15	6, 8 or 10	23	17.90°	37.80	3600	1.42
12	LF 12050/--	142	112	15	8, 9.52, 10	23	4.75°	4.15	3600	15.82
12	LF 12075/--	167	137	15	8, 9.52, 10	23	7.15°	9.25	3600	11.85
12	LF 12100/--	192	162	15	8, 9.52, 10	23	9.50°	16.50	3600	7.90
12	LF 12125/--	217	187	15	8, 9.52, 10	23	11.90°	26.65	3600	6.35

Fittings and shaft ends

Formed square, on flexible shaft

A Formed Square end is created when the ends of a round flexible shaft are mechanically formed into a square shape.

Pro:
- Most economical
- High torque capacity
- Allows axial movement
- Smalles OD profile

Con:
- Some radial backlash
- Wear on formed wires

Formed Tube Square, over shaft

A Formed Tube Square is when a close fitting round metal tube is mechanically formed over the round section of a flexible shaft.

Pro:
- Low wear on formed end
- Economical
- High torque capacity
- Allows axial movement
- Small OD profile

Con:
- Radial backlash - a few degrees

Round fitting (Female)

Round Female Fittings are made up of a round female hole on one end, which slips over the flexible shaft to be formed, and another round female hole which will interface with the driving or driven device. Typically uses set screws.

Pro:
- Moderate Cost
- Moderate torque capacity
- Fits directly to many motor shafts
- Low radial backlash

Con:
- Large OD profile
- No axial movement of shaft

Round fitting (Male)

Round Male Fittings are made up of a round female hole on one end, which is formed over the flexible shaft, and a round male tip which will unify with the driving or driven device.

Pro:
- Moderate Cost
- Moderate torque capacity
- Fits directly to many couplings
- Low radial backlash

Con:
- Large OD profile
- No axial movement of shaft

Square Fitting (Female)

Square Female Fittings are made up of a round female hole on one end, which slips over the flexible shaft to be formed, and a square female hole which will interface with the driving or driven device.

Pro:
- Allows axial movement
- High torque loads

Con:
- High cost
- Radial backlash – a few degrees
- Some radial backlash

Square Fitting (Male)

Square male Fittings are made up of a female round hole on one end, which slips over the flexible shaft to be formed, and a square male tip which will interface with the driving or driven device.

Pro:
- Allows axial movement
- Most commonly used fitting
- High torque loads

Con:
- Moderate cost
- Some radial backlash

Fittings and shaft ends

Hex Fitting (Female)

Hex Female fittings are made up of a round female hole on one end, which slips over the flexible shaft to be formed, and a hex female hole which will interface with the driving or driven device.

Pro:
- Low radial backlash
- Easier installation than a square for radial alignment
- Allows axial movement
- High/Moderate torque capacity

Con:
- High cost

Hex Fitting (Male)

Hex male fittings are made up of a female round hole on one end, which slips over the flexible shaft to be formed, and a hex male tip which will interface with the driving or driven device.

Pro:
- Low radial backlash
- Easier installation than a square for radial alignment
- Allows axial movement
- High/Moderate torque capacity

Con:
- Moderate cost

Spline Fitting (Female)

Splined female fittings are made up of a round female hole on one end, which slips over the flexible shaft to be formed, and a splined female hole which will interface with the driving or driven device.

Pro:
- Lowest radial backlash
- Highest torque loads
- Easiest installation for radial alignment
- Allows axial movement

Con:
- Higher cost

Spline Fitting (Male)

Splined male fittings are made up of a female round hole on one end, which slips over the flexible shaft to be formed, and a splined male tip which will interface with the driving or driven device.

Pro:
- Low radial backlash
- High torque loads
- Easiest installation for radial alignment
- Allows axial movement

Con:
- Increased cost

Panel Mount

Panel mount is a tip designed to fit on a plate in such a way that rotary motion of the shaft assembly is unhindered while axial motion is constrained.

Pro:
- Easy installation on a panel

Con:
- Low speed applications only
- Low torque loads typically

Custom

Custom fittings are available and built to spec.

Contact us for more information.