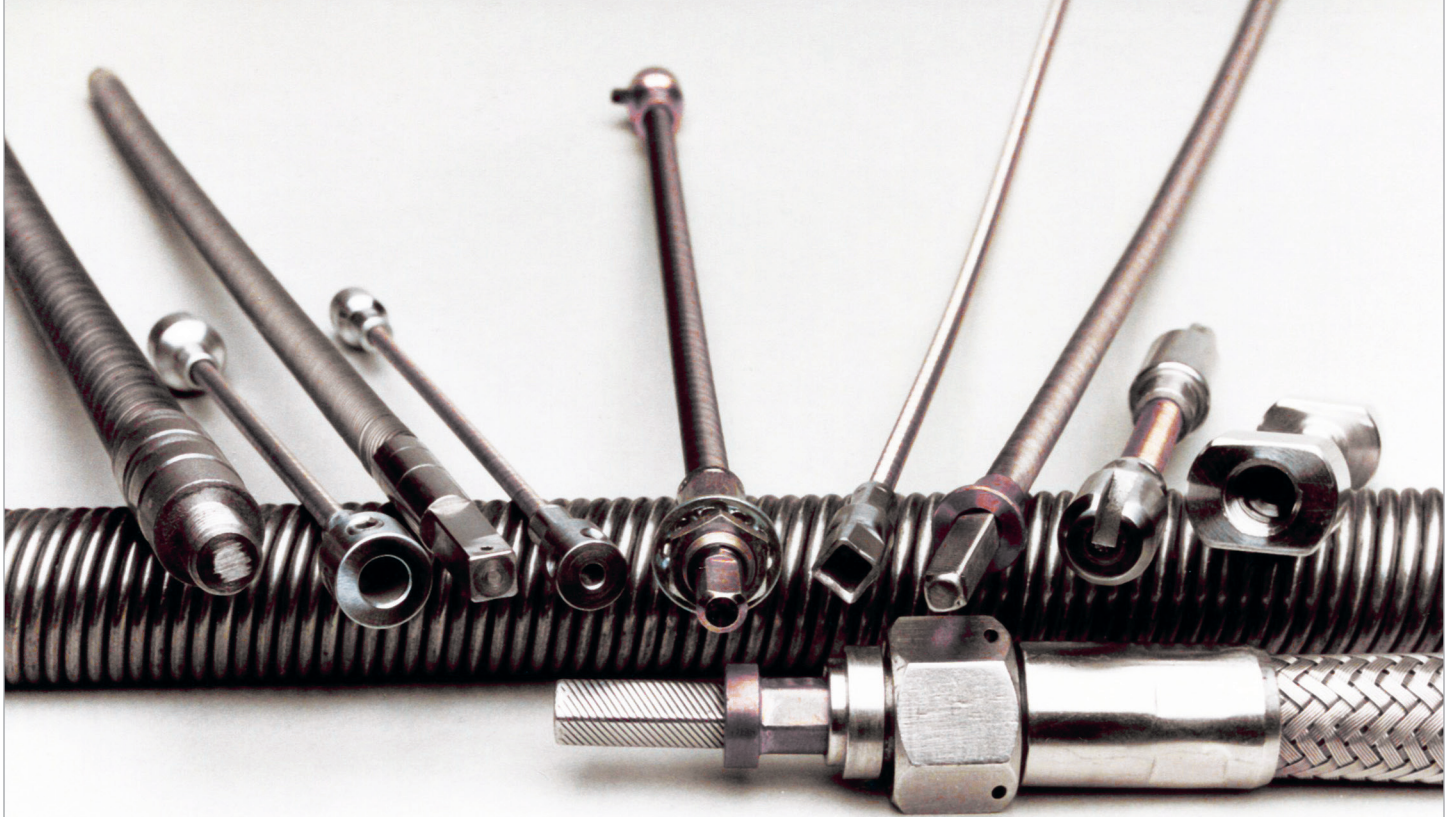




# Flexible Rotary Power Transmission

## Solutions Guide





With thousands upon thousands of unique flexible shaft assemblies in use, Elliott products can be found in an incredibly wide range of applications, literally everywhere.



## CATALOG CONTENTS

### About Elliott Manufacturing

A Worldwide Leader.....	3
Elliott Product Sampling.....	5

### Understanding Flexible Shafts

Flexible Shaft Design Solutions.....	6
Flexible Shaft Components.....	7

### Choosing Your Elliott Flexible Solution

Choosing the Right Flexible Shaft .....	8
Technical Design Considerations .....	9
Guidelines for Success .....	12
Flexible Shaft Assemblies .....	14
Flexible Shaft Couplings.....	18
Components.....	19
Tool Shafts .....	21
Ordering Standard Flexible Shafts .....	22
Custom Solutions.....	23



elliott manufacturing





## Elliott Manufacturing is a worldwide leader in flexible shaft systems that safely and efficiently transmit rotational power.

Founded in 1932, our product portfolio has evolved to include flexible shaft assemblies, flexible couplings, gearboxes, clutches, push-pull control assemblies, and valve actuation systems.

At Elliott, our consistent and shared focus on product design, quality, safety, innovation, and continuous improvement ensures you and your customers receive the best flexible shaft products available today. Over the years, our engineering expertise, insightful investments in research and development, and ongoing commitment to best-in-class manufacturing have placed us at the forefront of the flexible shaft industry. We're ISO9001:2015 and AS9100D certified.

Elliott serves customers around the world, including OEMs, Tier 1 leaders, and a network of aftermarket distributors and agents. Our versatile and innovative transmission technology brings value to challenging and rugged environments in a diverse range of industries, including:

- Aerospace
- Agriculture
- Automotive
- Construction
- Industrial
- Marine
- Medical
- Military
- Outdoor Power Equipment
- Power Gen
- Valve Actuation
- Many Others

Contact us at +1-607-772-0404 or [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com) to discuss your application.



Did you know?

**Elliott is the #1 supplier of flex shafts**  
to the global gasoline-powered trimmer market.



Elliott flexible shafts efficiently and reliably transmit power to a driven element that must move during operation, even around corners or into machines. With an extensive line of standard products, the design expertise to create custom systems, and a modern in-house machine shop, Elliott is your one-stop source for a complete flexible power solution.

## What problem can we solve for you?

Contact Elliott today  
for a Customer Design  
Specification Sheet  
to start defining  
your application!

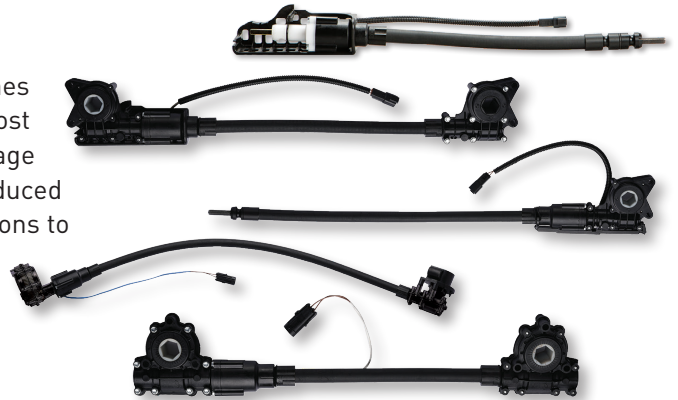
See page 13  
for details.



## FLEXIBLE SHAFT DRIVE SYSTEMS FOR AGRICULTURE

Elliott offers flexible shaft drive systems, gearboxes, and clutches for seeders that bring enhanced row control performance to most planters on the market today — providing a mechanical advantage without the need for additional power sources. Since first introduced in 2003, we've built more than two million of these smart solutions to help farmers improve productivity and save time and money:

- Row Control and Row Control+
- Surface Drive
- GroundControl
- FlexSeeder



## FLEXIBLE SHAFT AND PUSH/PULL ACTUATION SYSTEMS FOR AEROSPACE

Leading Tier 1 OEMs rely on Elliott shafts for thrust reverser actuation, flap and slat actuation, seat adjustment, and passenger door drives. Our engineers have designed flexible shaft systems for advanced applications on private and commercial planes, military planes, helicopters, tanks, and ground support systems. Extreme environment uses include missile shroud deployment, engine extension and gimbal control, and synchronization.



## REMOTE VALVE CONTROL SYSTEMS FOR INDUSTRIAL, MARINE, AND POWER GEN

Elliott provides the most versatile, reliable, and proven remote mechanical valve actuation available today. Our flexible shaft solutions for remote valve control systems offer safe valve actuation in some of the world's most difficult and dangerous locations. Elliott branded systems include:

- **Safe Operator Remote Valve Control** – A smart alternative to chain wheel valve operators that adds security and reliability in industrial plants
- **Uniflex-Stowe Remote Valve Control** – Precision-engineered system for critical environments such as naval and nuclear applications



## FLEXIBLE SHAFT PRODUCTS FOR OUTDOOR POWER EQUIPMENT

Elliott is the #1 global supplier to the gasoline-powered weed trimmer market. Our shafts also help to remotely position starters and provide flexible steering shafts in UTVs and direct snow discharge chutes on snow throwers.

## FLEXIBLE SHAFT PRODUCTS FOR CONSTRUCTION

Elliott's dependable and durable flexible shafts are used in a range of construction tools, such as concrete vibrators, power screeds and trowels, drywall sanders, and duct cleaners.



**Elliott has push/pull cable assemblies for all markets. What problem can we solve for you?**



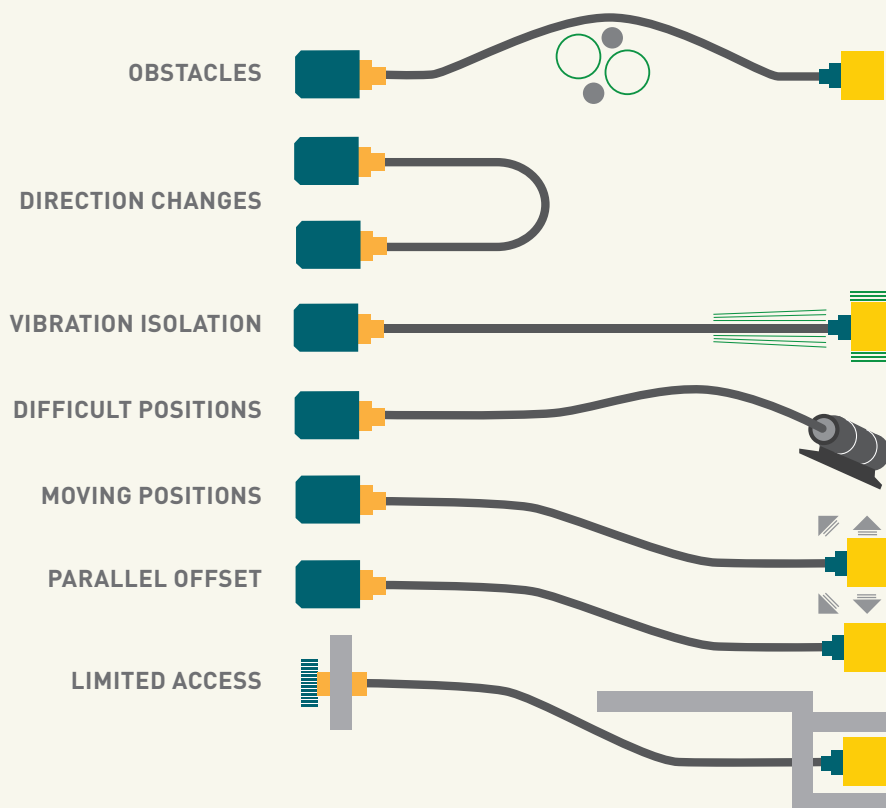
## Elliott flexible shafts can solve your power transmission problems...fast.

They are ideally suited for transmitting power over, under, around, and even through obstacles that would hinder other systems. They can overcome problems of misalignment, and absorb and isolate vibration, significantly simplifying your transmission application.

Our flexible shafts can easily withstand the shock of sudden load changes due to starting and stopping. They will transmit power to a driven element that must move during operation, around corners, or into machines — all while allowing for a high degree of freedom in mounting drive units such as electric motors.

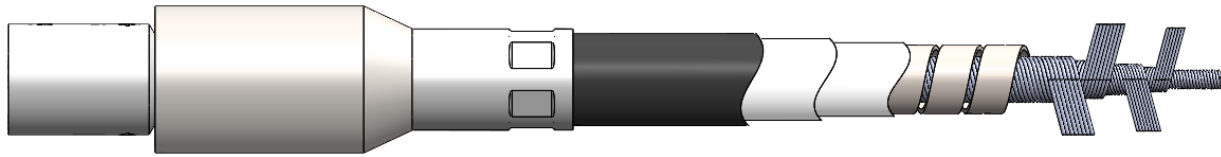
Solve complex drive problems easily with an Elliott flexible shaft. Reduce your design time, and lower your assembly and maintenance costs safely without the use of exposed universal joints, gears, pulleys, or couplings. Consider Elliott flexible shafting early in your design process to take full advantage of our ability to solve demanding drive problems efficiently, economically, and with the flexibility you need.

### COMMON POWER DRIVE PROBLEMS. SMART FLEX SHAFT SOLUTIONS

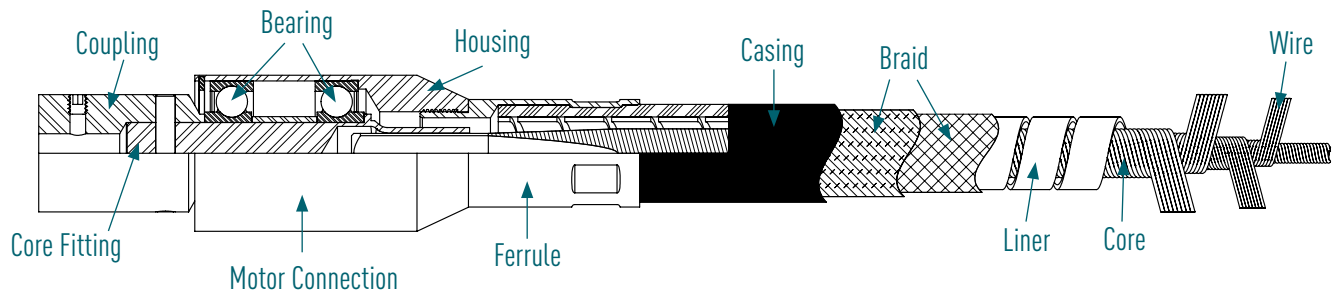


Elliott flexible shafts are the simple answer to all typical power transmission challenges...and so much more.





Elliott flexible shaft components are precision engineered and meticulously crafted for a lifetime of efficient and worry-free service.



**CORE:** Core size is determined by the load and rpms transmitted through the shaft. Elliott cores are wound with multiple layers of wire and are available in a variety of materials, constructions, and sizes.

- Core sizes range from 0.125" to 1.625"
- Support up to 10HP and 0-50,000 rpms



**COUPLINGS:** These female sockets are located at the end of the flex shaft assembly and engage the mating components within your equipment.

- Range from 0.125" to 0.500" core diameter
- Plain bored fittings provide easy attachment with set screws
- Custom-designed couplings are available to fit existing equipment or to provide ideal connection solutions

**FITTINGS:** Fittings are machined or formed components that attach to the ends of the core to connect driving and driven elements.

- An infinite number of designs are possible to best mate with your power source
- Whenever possible, choose the simplest drive, — a male square formed on the end of the core

**CASING:** The casing, or flexible conduit, protects and supports the core during operation and prevents helixing under load. Elliott offers a range of casing designs to enhance performance and prolong life in varying environmental conditions. Our casings are engineered to exhibit a minimum amount of stretch and twist, and to provide a uniform bearing surface for the core.

- Choose from materials that withstand dust, oil, moisture, abrasion, and temperature extremes
- Casings have a steel or polymer liner, steel and/or cloth reinforcing braids, and a rubber cover

**FERRULES:** These are the terminals attached to the end of the casing. They support uniform bending and prevent casing rotation. A wide variety of designs are available to best meet your application.

**MOTOR CONNECTION:** Elliott flexible shafts rely on a range of diverse end connections. They can be as simple as a single fitting or can contain multiple parts to form the most efficient motor connection. Along with connecting the flexible shaft to a power source, end connections also offer added support for the casing.

**MATERIALS AND FINISHES:** All Elliott machined parts, fittings, ferrules, and motor connections are made from quality, cold-finished steel. Standard finishes are black oxide or zinc plate. Custom materials and finishes are available.



# Choosing the Right Flexible Shaft

## STANDARD SHAFTS

Elliott offers a comprehensive line of standard flexible shaft assemblies that may be the simple solution you need. Our standard shafts can be delivered quickly, typically at the most affordable cost and offering the easiest replacement. Always consider a standard shaft first, as it can save you both time and money.

## STANDARD SHAFT ASSEMBLY OPTIONS

Choose from three categories of standard Elliott flexible shaft assemblies:

- Ball bearing units for high-speed applications
- Plain bearing units for low and moderate-speed needs
- Flexible couplings with and without casing for more demanding requirements

All of our standard flexible shaft assemblies are available with core for power drive or remote-control service.

## STANDARD BALL AND PLAIN BEARING UNITS

Elliott standard ball and plain bearing flexible shaft units are available in a range of sizes, from 3/16" to 1-1/4" core diameters. Each comes with bored couplings and set screws for fast and easy installation to the shank of a drive and driven spindle. All units are fully enclosed with a rubber covered casing and lubricated during assembly. See pages 9-12 for the load capacity of power drive and remote control shafts. Outline dimensions of all units are detailed beginning on pages 14-17.

## FLEXIBLE COUPLINGS

Standard Elliott flexible couplings are offered in sizes from 1/8" to 1/2" in core diameter with and without casing. All Elliott flexible couplings arrive with plain bored fittings for easy attachment with set screws. If your application requires a longer flexible coupling, over 12", add a casing for extra support and increased capacity. Learn more on page 18, including torque capacity and outline dimensions.

Did you know?

For unique applications, stringent requirements, or high volume quantities, Elliott engineers are always available to design a custom flexible shaft solution to meet your exact needs.







## TYPES OF CORE

Elliott manufactures flexible shafts with cores of varying materials, construction, and technique to provide a range of high quality options. **Power Drive and Remote Control** are the two basic core types.

1. **Power Drive** cores transmit rotary motion continuously in one direction. They are made of high carbon flexible shaft wire and wound on leading-edge automatic winding machines. Stress relief is precisely controlled to provide optimum flexibility and smoothness.
2. **Remote Control** (bi-directional) cores transmit rotary motion in both directions at slow speeds (<100 rpms) or high-speed, intermittent applications. They also exhibit a minimal amount of angular deflection (wind up) in both directions of operation. Remote control cores use a greater number of wires and layers, all precisely calculated for nearly identical properties of deflection and strength in both operational directions.

## WHAT TO KNOW

To choose the proper diameter core size for your application, you must know the power to be transmitted — either hp or torque and rpm — along with your radius of operation. To reduce the torque load on the core, transmit power at the highest possible RPM. You may be able to use a smaller diameter shaft if you gear the core to run at a higher rpm, which can lower the applied torque below the maximum dynamic torque capacity. This applies if you are limited by the dynamic torque capacity in choosing your core.

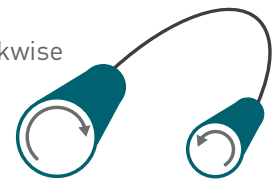
## DIRECTION OF ROTATION

You must also consider the direction of rotation, especially in a power drive core. If operated in the wrong direction, it will transmit as much as 30% less power. Standard

Use the instructions here and the tables on pages 10 and 11 to identify the proper core for your application.

power drive cores are offered in both directions of wind; right hand for clockwise operation and left hand for counter-clockwise operation. Standard remote control (bi-directional) cores are offered in right hand wind for both directions of operation. Observe your direction of operation from behind the driving end to determine what type of wind you need.

This is an example of clockwise operation, which requires a right hand core.



## OPERATING RADIUS

When choosing a flexible shaft, do not exceed the minimum radius of operation, or the smallest radius in which a core can be operated. Use your actual radius of bend to select the core size.

## TORSIONAL DEFLECTION

Torsional deflection, or the angular wind up of a core, is a factor when the angular orientation between input and output is required within specific limits. Review this information carefully as it may dictate the diameter core needed for your application.

## SPECIAL CONSIDERATIONS

Temperature, magnetic fields, or corrosives may be other considerations. Using special materials can solve any of these challenges. Talk to an Elliott representative for recommendations on your particular application.

# Technical Design Considerations for Power Drive

## FOR POWER DRIVE

To choose the right diameter Elliott core for power drive flexible shaft applications (over 100 rpm), you must know:

1. Hp and torque to be transmitted by core
2. Rpm
3. Minimum radius of bend
4. Maximum torque (starting or stopping)
5. Direction of rotation

In the table below, locate the hp value of your application in the proper column under "Radius of Operation." Compare your actual torque to the maximum dynamic

torque capacity taking care not to exceed it. If you do exceed the maximum dynamic torque capacity, continue down the column of Radius of Operation until you reach a value large enough for your application.

If your hp is too large, verify if your actual torque requirements are within the range of flexible shafting. Use the following formulas to calculate your power requirements.

$$\text{torque} = \frac{\text{hp} \times 63,000}{\text{rpm}}$$

$$\text{hp} = \frac{\text{torque} \times \text{rpm}}{63,000}$$

CORE DATA							H.P. RATING-MAXIMUM DYNAMIC TORQUE (LB-IN) AT GIVEN RADIUS (H.P. Values in shaded area)										
Nominal Dia	Actual Dia	Part No (Note C)	Wt/100 Ft	Max. Static Torque Capacity (LB-in) (Note B)	Max. Continuous RPM	Min Radius of Operation (Inches)	RADIUS OF OPERATION (INCHES)										
							3	4	6	8	10	12	15	20	25	50	
1/8"	.125 .130	10170	3.3	12	20,000	3	.04 .5	.08 1.0	.12 1.6	.14 1.8	.15 1.9	.15 1.9	.16 2.0	.16 2.1	.17 2.3	.18 2.5	
5/32"	.145 .150	10168	4.5	24	20,000	4		.10 1.5	.24 3.5	.28 5.0	.32 5.5	.34 5.8	.37 6.0	.38 6.2	.40 6.5	.44 7.0	
3/16"	.181 .185	10630	6.8	48	15,000	4		.19 4.0	.34 5.5	.40 7.0	.46 7.5	.49 8.0	.53 8.5	.57 9.0	.60 9.5	.66 12.0	
1/4"	.241 .245	8145	12.5	96	15,000	5			.44 12.0	.50 14.0	.60 15.0	.65 16.0	.70 18.0	.75 20.0	.80 22.0	.87 24.0	
1/4"	.248 .252	8552	12.4	88	20,000	5			.46 13.0	.52 15.0	.58 15.5	.62 16.0	.66 17.0	.70 18.0	.75 20.0	.80 22.0	
5/16"	.309 .312	9723	19.2	190	10,000	6			.51 18.0	.62 20.0	.74 24.0	.82 26.0	.91 30.0	1.00 32.0	1.05 35.0	1.10 40.0	
3/8"	.370 .374	8149	28.2	250	10,000	6			.62 30.0	.88 42.0	1.10 48.0	1.20 60.0	1.40 55.0	1.50 65.0	1.60 70.0	1.70 75.0	
7/16"	.437 .441	8134	38.5	380	6000	6			.74 40.0	1.00 50.0	1.20 60.0	1.40 65.0	1.60 75.0	1.80 80.0	2.00 85.0	2.10 90.1	
1/2"	.500 .496	8585	49.6	500	6000	6			.80 50.0	1.10 60.0	1.30 74.0	1.50 88.0	1.80 95.0	2.10 110.0	2.30 130.0	2.60 150.0	
5/8"	.621 .626	8586	77.6	700	4000	8				1.40 100.0	2.00 132.0	2.40 158.0	2.80 180.0	3.10 190.0	3.30 205.0	3.60 235.0	
11/16"	.677 .681	9263	91.2	860	3750	10					2.20 150.0	2.60 172.0	3.00 198.0	3.40 215.0	3.60 232.0	3.90 260.0	
3/4"	.740 .747	8587	112.7	980	3000	15							3.00 180.0	3.40 200.0	4.00 220.0	4.80 350.0	
1"	.990 .997	8588	200	1300	2500	20								4.40 380.0	5.00 5000	7.00 7200	
1-1/4"	1.240 1.247	8559	310	1900	2500	20								6.00 420.0	9.00 7000	10.0 1200.0	

### Notes:

- Each core can transmit hp up to its maximum rpm, as long as the maximum dynamic torque capacity is not exceeded (for higher rpms contact Elliott.)
- Each core will either break or helix under this load. For short-term overloads (shock loads), do not exceed 50% of this value.
- Direction of operation is always determined by observing from behind the driving end. Add a (-1) to this part number for clockwise operation and a (-2) for counter-clockwise operation.



# Technical Design Considerations for Remote Control

## FOR REMOTE CONTROL

To choose the right diameter Elliott core for remote control or bi-directional flexible shaft applications, you must know:

1. Torque to be transmitted by core
2. Minimum radius of bend
3. Rpm of operation (if applicable)
4. Maximum allowable torsional deflection (if applicable)

In the table below, locate a torque figure applicable to your application in the proper column under "Radius of Operation." Read across for the properties of that

particular core. If the deflection listed is unacceptable, move to the next largest size.

Special consideration must be given when using bi-directional cores for power drive applications, both continuous and intermittent. For continuous power drive applications, reduce torque values listed by 70%. On intermittent power drive installations, core can be operated for a short period of time limited by heat built up.

**We are here to help. If you have questions when choosing a core, contact Elliott Customer Service at +1 607-772-0404.**

CORE DATA									TORQUE RATING (LB.-IN.) FOR BOTH DIRECTIONS OF OPERATION AT GIVEN RADIUS (NOTE A) RADIUS OF OPERATION										
Nominal Dia.	Actual Dia.	Part No. (Note C)	Wt./100 Ft.	Max. Torque Capacity (Lb.-In.) (Note B)	Max. RPM Intermittent Operation	Max. Torsional Deflection at Given Torque in Degrees Per Foot													
						Torque	Deflection°/Ft. Wind	Unwind											
1/8"	.124 .128	10171	3.4	10	30,000	1 LB-IN	14°	17°	3.0	3.6	5.5	6.5	7.0	7.5	7.5	7.5	7.5	7.5	
5/32"	.145 .150	10169	4.8	20	20,000	1 LB-IN	7°	9°	6.0	7.0	8.0	9.0	10.0	11.0	12.0	12.0	12.0	12.0	
3/16"	.181 .185	8144	6.9	45	20,000	1 LB-IN	3.5°	4°		14.0	16.0	18.0	22.0	24.0	26.0	26.0	26.0	26.0	
1/4"	.245 .249	8146	12.8	95	20,000	5 LB-IN	5°	6°		28.0	32.0	36.0	44.0	48.0	55.0	55.0	55.0	55.0	
5/16"	.307 .311	8148	19.7	150	20,000	10 LB-IN	6°	7.5°		56.0	64.0	72.0	88.0	96.0	110.0	110.0	110.0	110.0	
3/8"	.374 .378	8150	28.8	220	20,000	10 LB-IN	3.5°	5°			102.0	116.0	124.0	132.0	140.0	140.0	140.0	140.0	
1/2"	.496 .499	8296	54	340	10,000	100 LB-IN	10°	13°				200.0	220.0	240.0	260.0	280.0	280.0	280.0	
5/8"	.614 .618	8172	75	550	7,000	100 LB-IN	2.5°	3.5°					275	300	330	370	380	400	
3/4"	.740 .747	8587	113	670	5,000	100 LB-IN	1.5°	1.6°							440.0	480.0	500.0	500.0	
1"	.990 .997	8588	200	1300	5,000	960 LB-IN	7°	7°								920.0	950.0	975.0	
1 1/4"	1.240 1.247	8559	310	1900	2,500	1900 LB-IN	5°	5°								1000	1200	1500	
1.300"	1.292 1.299	8660	340	1920	2,500	1920 LB-IN	5°	5°								1100	1300	1600	
1 5/8"	1.618 1.611	8663	600	3000	1,750	3000 LB-IN	4°	4°									2500	2700	

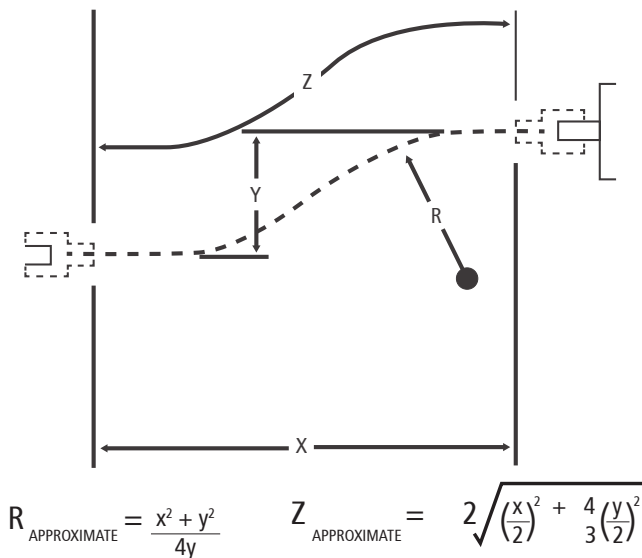
### Notes:

- Each core can transmit this torque in both directions of operation for remote control applications (less than 100 rpms) and intermittent power drive applications (no longer than it takes to raise core temp 70° above ambient with rest duration allowing for core to cool within 30° of ambient). For continuous power drive applications in both directions, use only 30% of these torques.
- Each core will either break or helix under this load. For short term overloads, do not exceed 75% of this value.
- Standard remote control cores are wound in the right-hand direction. Add a [-1] to part number for right hand or [-2] for left hand.

You expect consistent, reliable performance from your flexible shaft. These basic guidelines will help you choose for the best results.

### RADIUS CALCULATION

When designing a flexible shaft application, radius of operation is key. Maintain as large a radius as possible and avoid sharp bends or kinks. Use the diagram and formulas below to calculate radius of operation and shaft length in parallel offset applications.



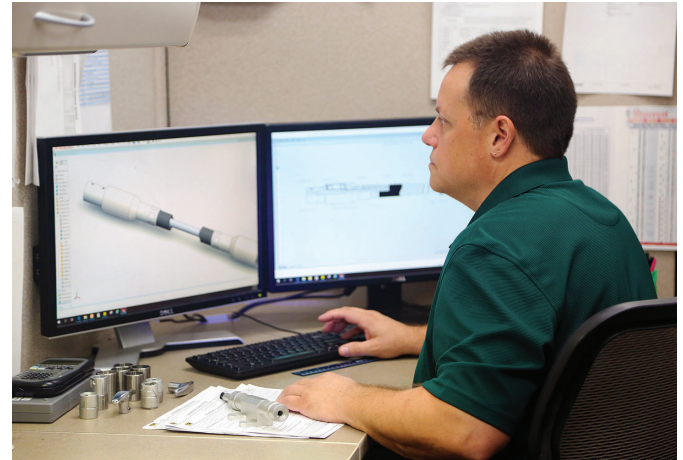
### QUICK TIPS FOR SUCCESS

#### Do...

- Use hp and torque to determine power requirements and find the proper diameter core for the application.
- Use the highest possible rpm to transmit power and lower the torque load on the shaft.
- Operate the shaft in the largest possible radius, avoiding sharp bends or kinks.
- Install the shaft properly making sure the casing is straight for several inches beyond the ferrule, clamping it into position whenever possible, and avoiding excessive lengths (over 10 ft.)

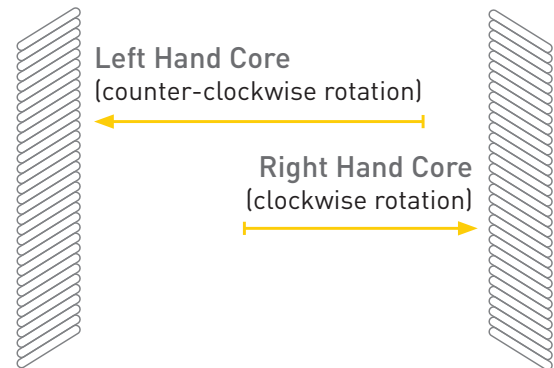
#### Don't...

- Bend a core into a radius smaller than recommended, even during shipment.
- Overlook the direction of rotation in choosing a core.
- Use the flexible shaft to support anything at all. It was not designed to be a handhold, foot rest, or other support.
- Ignore routine maintenance as described.



### DETERMINE CORE WIND

Using a sample of the core, observe the lay of the wires to easily determine the direction of wind.



Hold the core vertically and observe the wires. If they slant down to the right, you have a right-hand core. If they slant down to the left, you have a left-hand core. Use this terminology to describe your flexible shaft requirements to avoid confusion.

### CARE AND MAINTENANCE

Flexible shafts require a minimum of maintenance. After every 200 hours of use, the core should be re-lubricated as the screw action of the winding process shifts the lubricant to one end of the casing.

Remove the core from the casing and clean in a solvent. Remove all excess solvent and re-lubricate with a quality petroleum-based grease with a temperature range of -40° to +250° F. Never pack the casing with grease as it will increase torque load on the core.





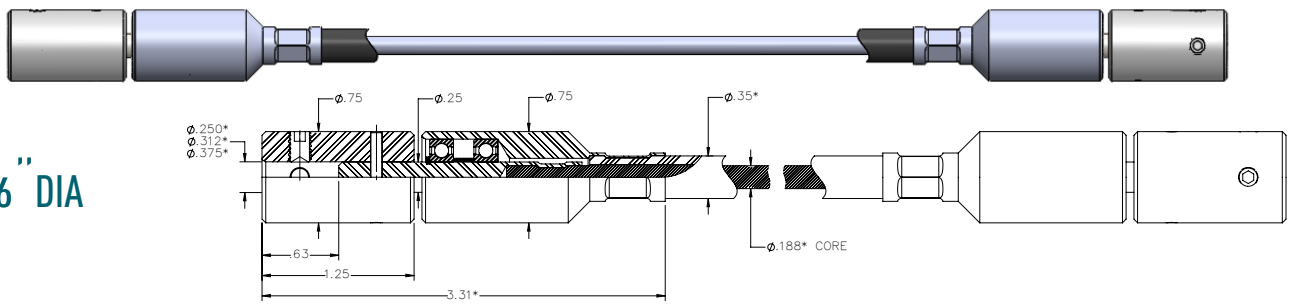
Did you  
know?

Elliott developed industry-specific “Customer Design Specification Sheets” for applications in the aerospace, agriculture, industrial/general purpose, medical, steering, and valve actuation markets. These sheets detail all of the important design questions on hp, torque, rpm, bend radius, coupling size, and more on one convenient form. Once completed, our application engineers can quickly respond to you with product recommendations. Request yours today.

# Elliott Flexible Shaft Assemblies - Ball Bearing Units

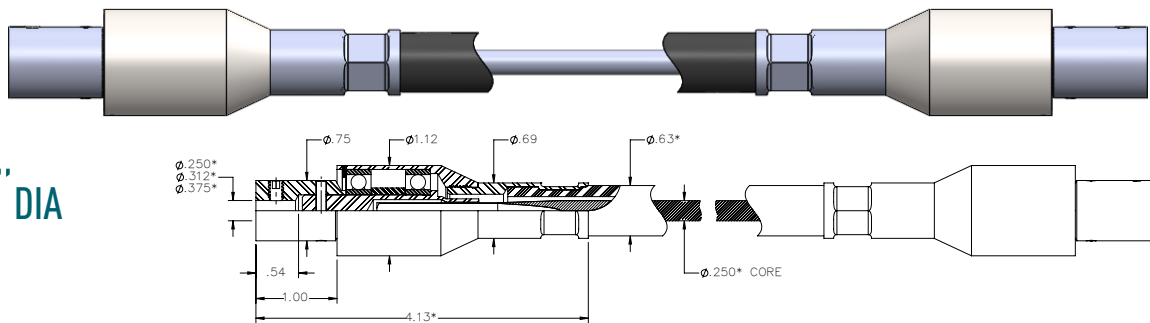
[\*Nominal – Reference]

3/16" DIA



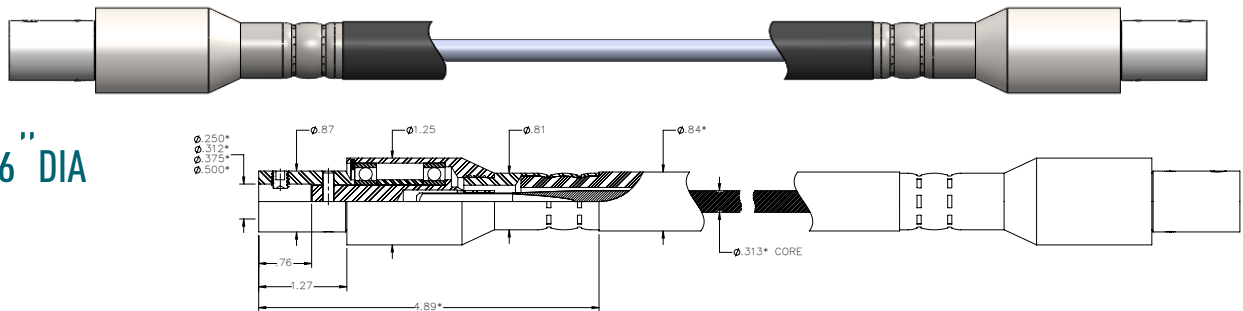
Recommended: Speed 6000 rpm Min Lgth. 9 in. Max Lgth. 15 ft. Min Bend Rad. 4 in.  
Ref P/N 7614

1/4" DIA



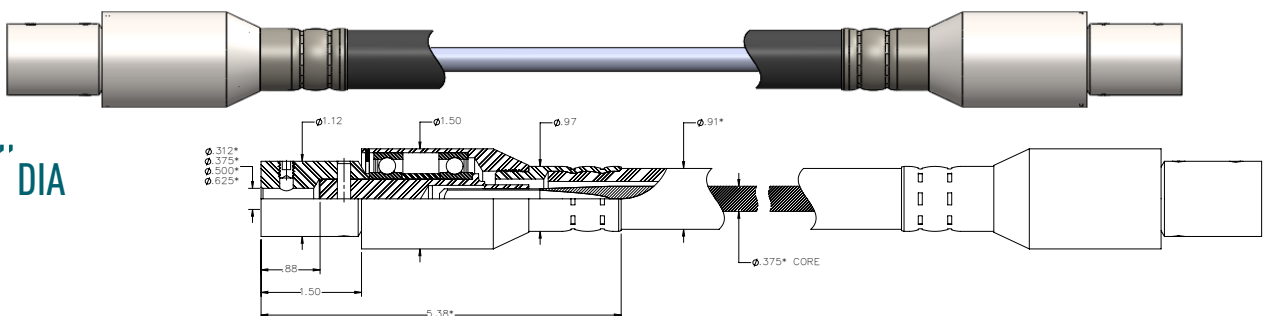
Recommended: Speed 6000 rpm Min Lgth. 10-1/2 in. Max Lgth. 15 ft. Min Bend Rad. 4 in.  
Ref P/N S12653

5/16" DIA



Recommended: Speed 6000 rpm Min Lgth. 10-1/2 in. Max Lgth. 15 ft. Min Bend Rad. 6 in.  
Ref P/N S12668

3/8" DIA



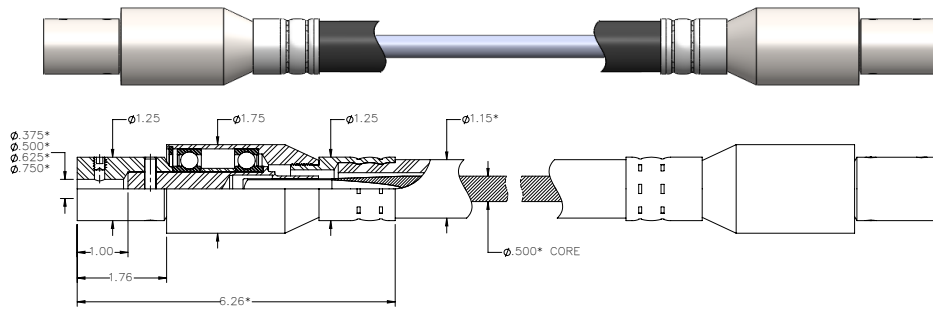
Recommended: Speed 6000 rpm Min Lgth. 13-1/2 in. Max Lgth. 15 ft. Min Bend Rad. 8 in.  
Ref P/N S12793



# Elliott Flexible Shaft Assemblies - Ball Bearing Units

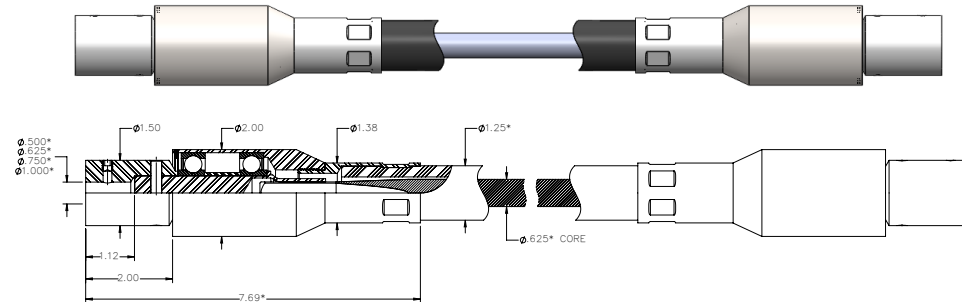
(\*Nominal - Reference)

Recommended:  
Speed 6000 rpm  
Min Lgth. 19 in.  
Max Lgth. 17 ft.  
Min Bend Rad. 8 in.  
Ref P/N S12810



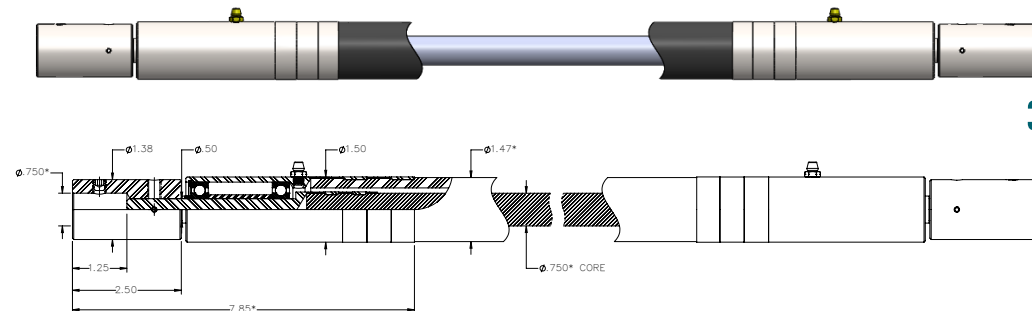
1/2" DIA

Recommended:  
Speed 5000 rpm  
Min Lgth. 20 in.  
Max Lgth. 17 ft.  
Min Bend Rad. 10 in.  
Ref P/N S12825



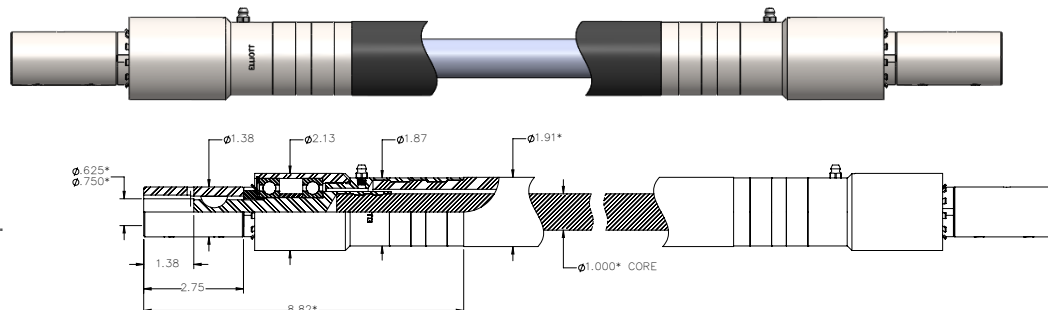
5/8" DIA

Recommended:  
Speed 4000 rpm  
Min Lgth. 22 in.  
Max Lgth. 20 ft.  
Min Bend Rad. 12 in.  
Ref P/N 3678



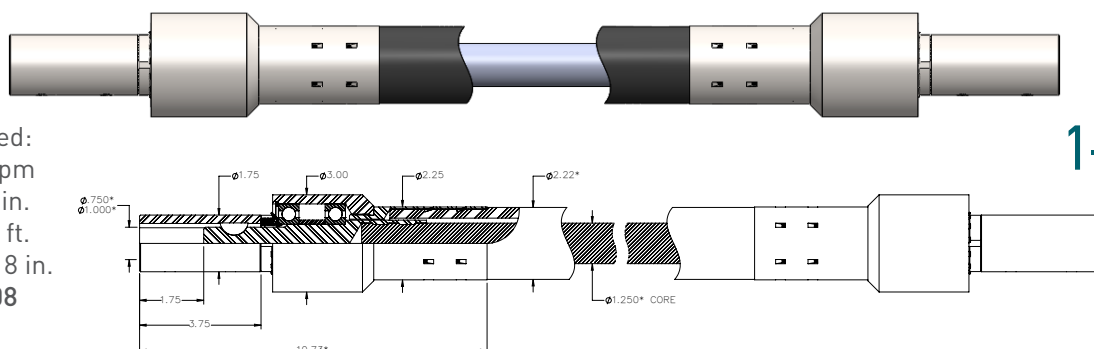
3/4" DIA

Recommended:  
Speed 2500 rpm  
Min Lgth. 26 in.  
Max Lgth. 20 ft.  
Min Bend Rad. 15 in.  
Ref P/N 3696



1" DIA

Recommended:  
Speed 2000 rpm  
Min Lgth. 26 in.  
Max Lgth. 25 ft.  
Min Bend Rad. 18 in.  
Ref P/N 3708



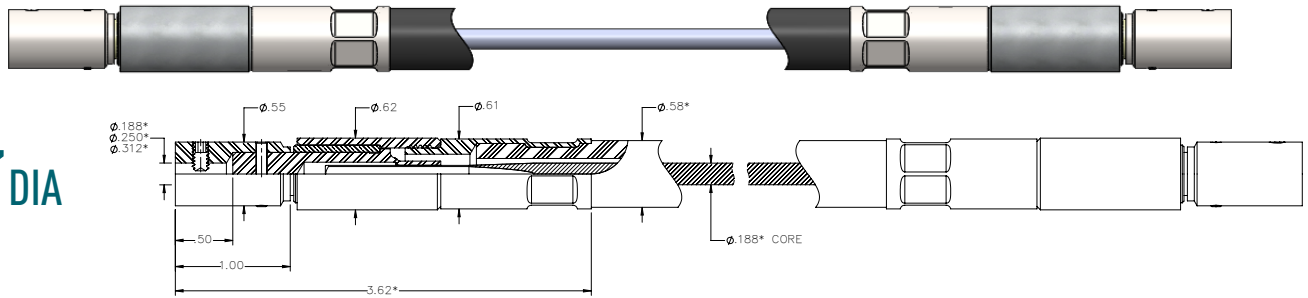
1-1/4" DIA

# Elliott Flexible Shaft Assemblies - Bronze Bearing Units

[\*Nominal – Reference]

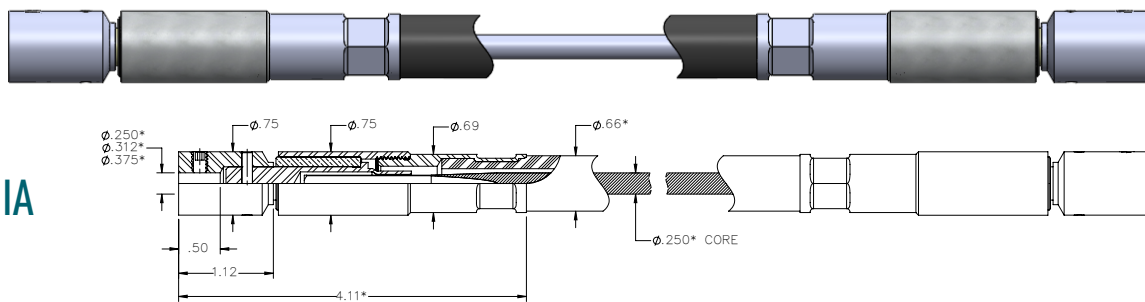
Self-  
Lubricating  
Bronze  
Bearings

3/16" DIA



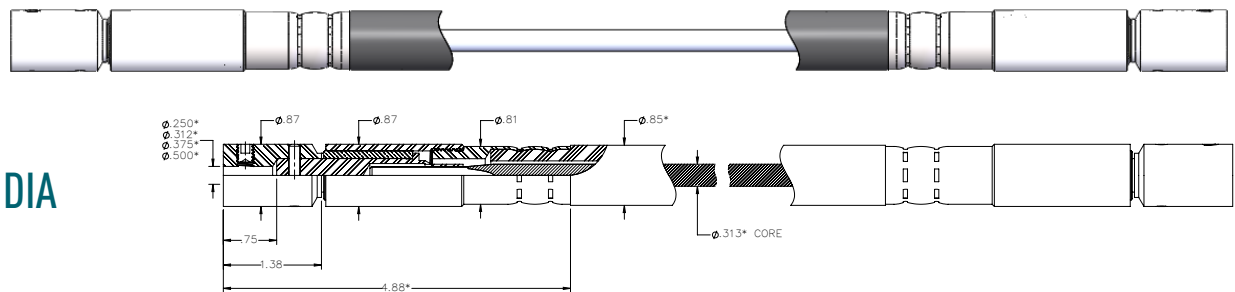
Recommended: Speed 2000 rpm Min Lgth. 8 in. Max Lgth. 15 ft. Min Bend Rad. 4 in.  
Ref P/N S15310

1/4" DIA



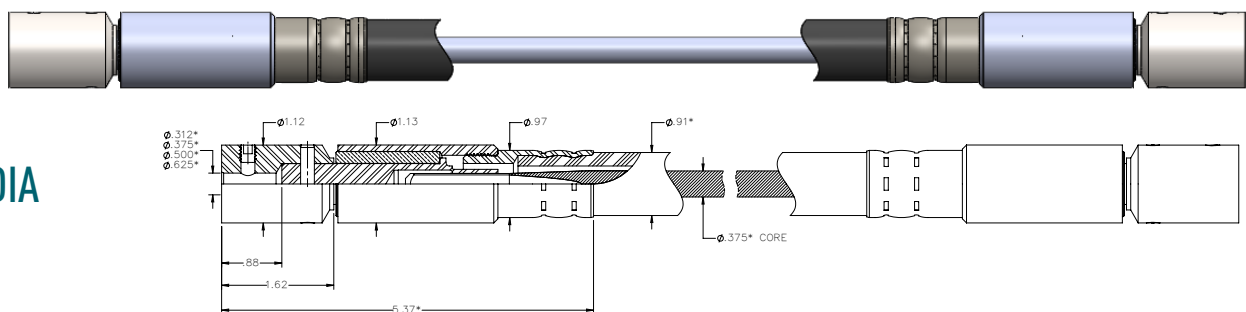
Recommended: Speed 2000 rpm Min Lgth. 9-1/2 in. Max Lgth. 15 ft. Min Bend Rad. 4 in.  
Ref P/N S12779

5/16" DIA



Recommended: Speed 2000 rpm Min Lgth. 10 in. Max Lgth. 15 ft. Min Bend Rad. 6 in.  
Ref P/N S12785

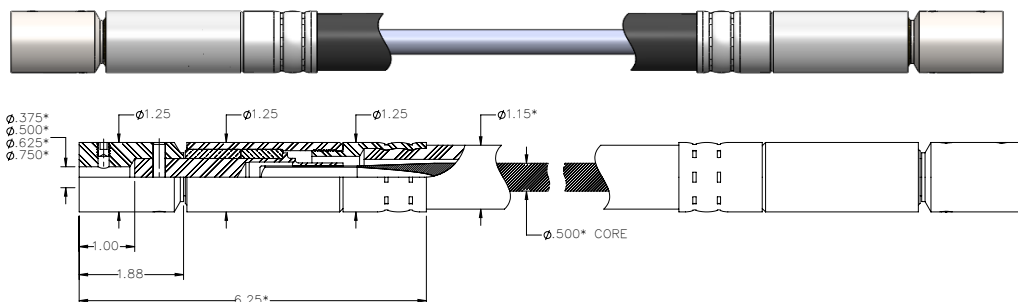
3/8" DIA



Recommended: Speed 2000 rpm Min Lgth. 12-1/2 in. Max Lgth. 15 ft. Min Bend Rad. 8 in.  
Ref P/N S12797

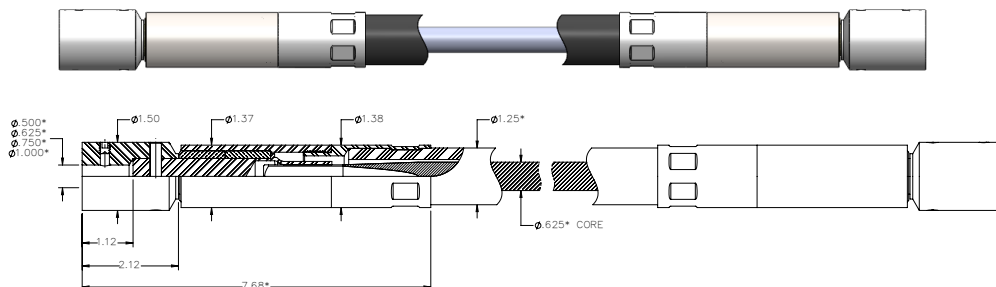


Recommended:  
Speed 2000 rpm  
Min Lgth. 17 in.  
Max Lgth. 17 ft.  
Min Bend Rad. 8 in.  
Ref P/N S12813



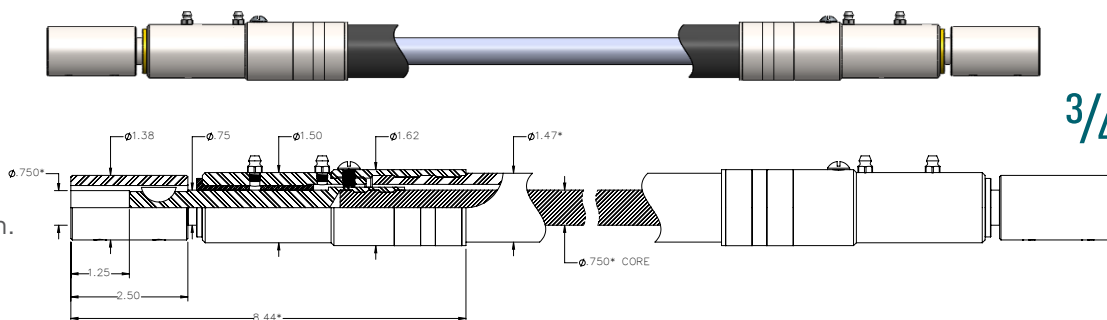
1/2" DIA

Recommended:  
Speed 1500 rpm  
Min Lgth. 22 in.  
Max Lgth. 17 ft.  
Min Bend Rad. 10 in.  
Ref P/N S12830



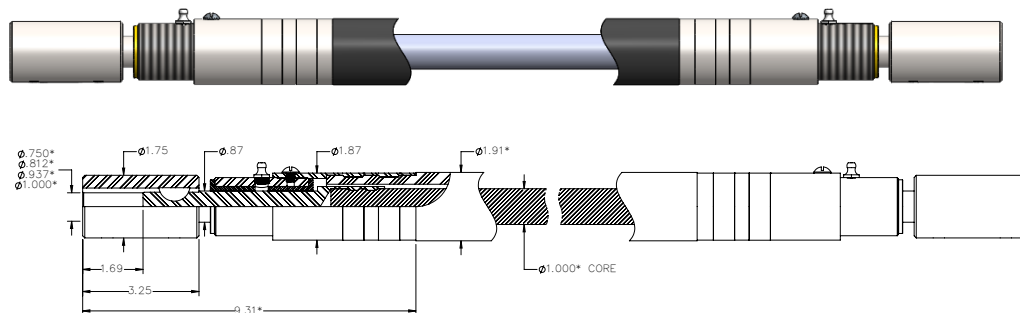
5/8" DIA

Recommended:  
Speed 1200 rpm  
Min Lgth. 23 in.  
Max Lgth. 20 ft.  
Min Bend Rad. 12 in.  
Ref P/N 3677



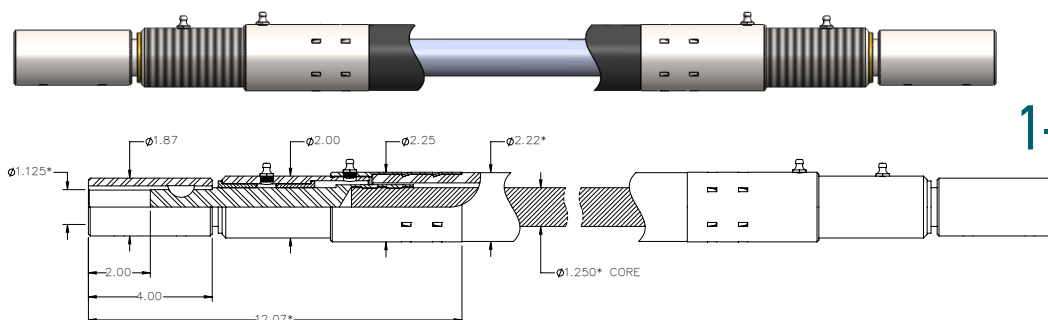
3/4" DIA

Recommended:  
Speed 1000 rpm  
Min Lgth. 27 in.  
Max Lgth. 20 ft.  
Min Bend Rad. 15 in.  
Ref P/N 3695



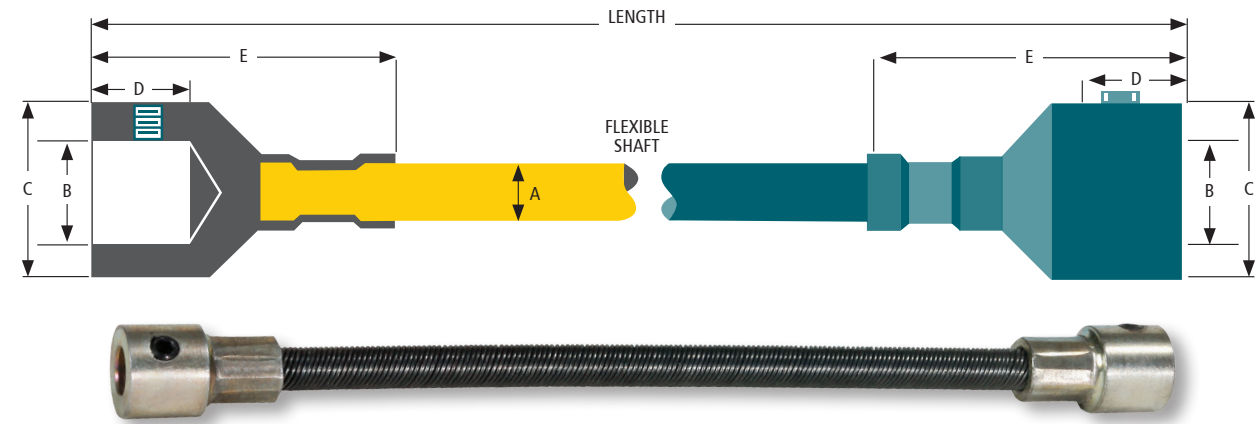
1" DIA

Recommended:  
Speed 1000 rpm  
Min Lgth. 27 in.  
Max Lgth. 25 ft.  
Min Bend Rad. 18 in.  
Ref P/N 3707



1-1/4" DIA

Elliott flexible couplings are an ideal solution for less demanding applications. The simple construction of fittings attached directly to the core and casing (when necessary) can offer a light, compact, inexpensive, and efficient solution to your flexible shaft needs.



FLEXIBLE COUPLINGS CONSIDERATIONS

When evaluating an Elliott flexible coupling for your application, follow all guidelines listed on pages 9-12 for determining core diameter along with length. Length can be a limiting factor when using flexible couplings with casing, as without casing the core has no support other than its own stiffness. Use the table to determine the maximum torque capacity for your flexible coupling. If you need increased torque capacity or are exceeding the maximum length for unsupported core, either specify casing or support the core as needed.

A Dia.	Part No.	B	C	D	E
1/8	8256-201	.188/.190	.500	.375	.844
	8256-202	.251/.253			
5/32	8257-201	.188/.190	.500	.376	.844
	8257-202	.251/.253			
3/16	8258-201	.188/.190	.500	.377	.812
	8258-202	.251/.253			
1/4	8259-201	.188/.190	.500	.378	.906
	8259-202	.251/.253			
5/16	8260-201	.251/.253	.625	.500	1.062
	8260-202	.313/.315			
3/8	8261-201	.313/.315	.750	.625	1.344
	8261-202	.376/.378			
1/2	8262-201	.376/.378	.875	.750	1.438
	8262-202	.501/.503			

Standard sizes shown above. Custom sizes available. Contact Elliott Mfg. for details.



Elliott flexible shaft components are precisely manufactured to stringent specifications.

Core Dia.	Type	Min. Rad.	Maximum Torque Capacity (Static or Dynamic) for Given: Length of Unsupported Core							
			2"	4"	6"	8"	10"	12"	14"	16"
1/8	PD	3	3.5	1.8	1.0	.8				
	RC	3.5	5.5	2.8	1.8	1.2	.8			
5/32	PD	3	4.0	2.0	1.4	1.0	.6			
	RC	3.5	5.5	2.8	1.8	1.2	.8			
3/16	PD	3.5	9.0	4.0	2.6	1.8	1.4	1.0		
	RC	4.0	9.4	4.6	3.0	2.2	1.6	1.1		
1/4	PD	4.0	20.0	10.0	6.4	4.2	3.5	2.8	2.2	1.8
	RC	4.5	25.0	12.5	8.0	5.8	4.4	3.5	2.9	2.0
5/16	PD	5	45.0	21.0	12.5	9.2	7.2	5.5	4.5	3.8
	RC	6	84.0	42.0	24.0	18.2	14.0	10.8	9.0	7.2
3/8	PD	6	100.0	58.0	37.0	28.0	18.0	16.0	13.0	10.0
	RC	8	120.0	62.0	45.0	32.0	24.0	18.0	16.0	12.0
1/2	PD	6	190.0	135.0	88.0	64.0	47.0	39.0	32.0	27.0
	RC	10	220.0	149.0	97.0	70.0	52.0	49.0	36.0	29.0



## FLEXIBLE SHAFT CASING

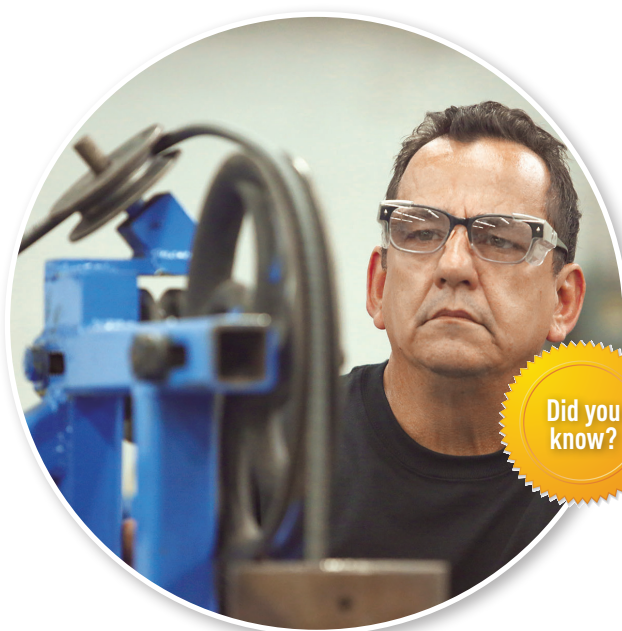
An Elliott flexible shaft casing acts as a support and a bearing for the core, and protects the rotating element from moisture, dust, abrasion, and injury. Because of its construction, the casing also retains any lubrication surrounding the core. Casing selection is determined by a number of factors, including:

- Specific application requirements
- Operating conditions such as exposure to gasoline, grease, oil, or water
- Exposure to extreme heat
- Resistance to corrosion
- Severe twisting, flexing, or stretching
- Abnormal service where dust and abrasion are considerations

Elliott cores and casings are available in mill lengths or pieces cut to length, with or without ferrules and fittings. As part of our full service, we supply all needed information on cutting and assembling these parts to form your flexible shaft assembly.

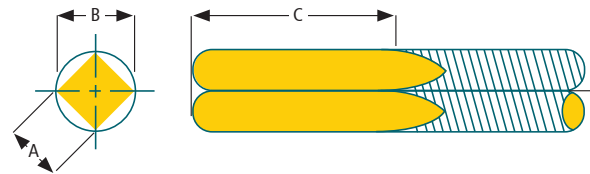
## SQUARED CORE ENDS

Squaring the end of the core is the simplest and least expensive drive for a flexible shaft. This eliminates the need for attaching a fitting and allows for the use of a smaller I.D. casing. Whenever possible, use a square end for optimal simplicity, savings, and reduction of solid length at the end of the core.



Did you know?

Nominal Core Diameter	Casing Part No.	Casing I.D. Min.	Casing O.D. $\pm .30$ "	Number of Braids	Loop Dia Inches	Weight Per Ft. (lbs)	External Covering Material
.187"	10589-2	.265"	.580"	2	6"-8"	.15	Hytrel
.250"	10598-1	.345"	.655"	2	6"-8"	.17	Hytrel
.312"	8241-3	.400"	.845"	1	6"-10"	.45	Rubber
.312"/.375"	8241-30	.432"	1.090"	1	12"-16"	.73	Rubber
.312"/.375"	8241-19	.432"	1.090"	2	12"-18"	.80	Rubber
.375"	8241-4	.515"	1.030"	1	12"-18"	.71	Rubber
.375"	8241-5	.545"	.970"	1	8"-12"	.46	Rubber
.500"	8241-6	.635"	1.150"	1	8"-10"	.81	Rubber
.500"/.590"	8241-31	.665"	1.290"	2	12"-16"	1.03	Rubber
.625"	8241-9	.815"	1.370"	1	10"-14"	1.01	Rubber
.625"	8241-28	.815"	1.370"	1	12"-16"	1.05	Rubber
.750"	8241-10	.990"	1.470"	1	16"-20"	1.10	Rubber



Core Diameter	A	B (Max.)	C (Min.)
.130	.101/.104	.140	1.250
.150	.121/.124	.161	1.250
.187	.147/.150	.197	.781
.250	.196/.200	.268	1.375
.312	.245/.250	.332	1.375
.375	.300/.305	.400	1.500
.437	.350/.355	.485	1.500
.500	.400/.405	.540	1.500
.624	.507/.512	.680	1.750

Elliott uses a wide variety of the highest quality materials and finishes to provide you with flexible shaft assemblies and components that meet the demands of your application and provide a lifetime of reliable performance.





Did you  
know?

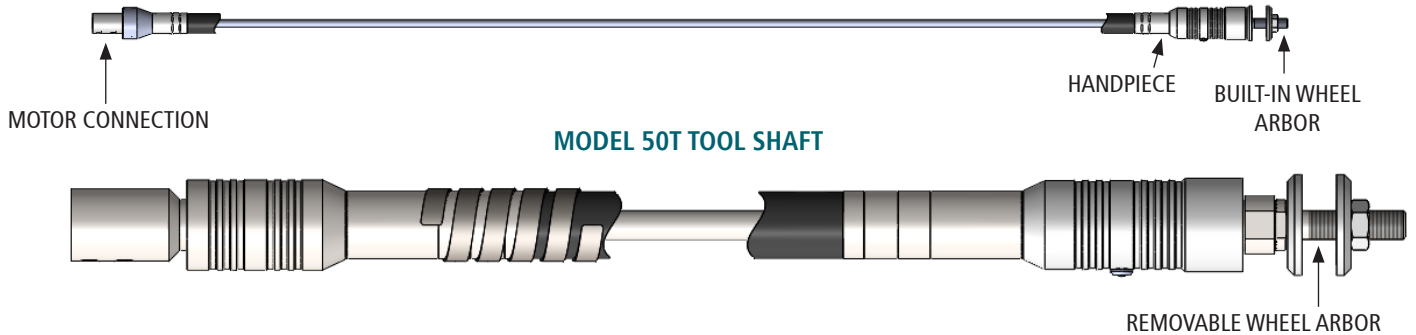
Leading-edge equipment and processes help ensure Elliott builds the best flexible shaft solutions available today.



## FLEXIBLE TOOL SHAFTS

Elliott flexible shaft units for medium and heavy duty grinding, wire brushing, polishing, and buffing are complete with ball bearing motor coupling. Flexible shaft core, case, and ball bearing handpiece are ready to be attached to any spare motor, gas engine, drill press, counter-shaft, or tractor power takeoff. Units are manufactured using power right core, with bore sizes and lengths shown below. They may be modified as needed to match your application.

### MODEL 38T TOOL SHAFT



Item #	Shaft Size	Length in ft.	Case OD in.	Max Horsepower		Standard Motor Connection Bore in.	Capacity in Inches					
				1750 RPM	3400 RPM		Grinding Wheel	Buffing Wheel	Sanding Disc	Sanding Drum	Wire Brush	Drilling Steel
S06465-601	38	5	0.91	1/3	1/2	1/2	4 x 1 x 1/2 I.D.	6 x 1/2 x 1/2 I.D.	7" Dia.	3 Dia. X 1-1/2 Face	6 x 1 x 1/2 I.D.	1/4 Dia.
S06465-603	38	5	0.91	1/3	1/2	5/8	4 x 1 x 1/2 I.D.	6 x 1/2 x 1/2 I.D.	7" Dia.	3 Dia. X 1-1/2 Face	6 x 1 x 1/2 I.D.	1/4 Dia.
S06465-602	38	6	0.91	1/3	1/2	1/2	4 x 1 x 1/2 I.D.	6 x 1/2 x 1/2 I.D.	7" Dia.	3 Dia. X 1-1/2 Face	6 x 1 x 1/2 I.D.	1/4 Dia.
S06465-604	38	6	0.91	1/3	1/2	5/8	4 x 1 x 1/2 I.D.	6 x 1/2 x 1/2 I.D.	7" Dia.	3 Dia. X 1-1/2 Face	6 x 1 x 1/2 I.D.	1/4 Dia.
S06969-501	50	6	1.06	1	1-1/2	1/2	6 x 1 x 1/2 I.D.	6 x 1 x 1/2 I.D.	9" Dia.	5 Dia. X 2 Face	8 x 1 x 1/2 I.D.	3/8 Dia.
S06969-502	50	6	1.06	1	1-1/2	5/8	6 x 1 x 1/2 I.D.	6 x 1 x 1/2 I.D.	9" Dia.	5 Dia. X 2 Face	8 x 1 x 1/2 I.D.	3/8 Dia.
S06969-503	50	6	1.06	1	1-1/2	3/4	6 x 1 x 1/2 I.D.	6 x 1 x 1/2 I.D.	9" Dia.	5 Dia. X 2 Face	8 x 1 x 1/2 I.D.	3/8 Dia.

### APPROXIMATE CALCULATIONS FOR WEIGHT OF FLEXIBLE SHAFTING (FORMULAS ARE FOR STEEL)

Core	.202 x core dia. <sup>2</sup> x length (in inches)
Casing	For description of casing, see pages 7 and 19
Interlocked Light-Weight Casing	For I.D.s up to 1/2"   Weight = [(0.027 x casing I.D.) + .002] x length (in inches)* For I.D.s 1/2" and up   Weight = [(0.023 x casing I.D.) + .002] x length (in inches)*
Interlocked Standard Weight Casing	For I.D.s 1/2" and up   Weight = [(0.052 x casing I.D.) + .007] x length (in inches)*
Interlocked Light-Weight with Liner Casing	For I.D.s up to 1/2"   Weight = [(0.055 x casing I.D.) + .006] x length (in inches)* For I.D.s 1/2" and up   Weight = [(0.064 x casing I.D.) + .007] x length (in inches)*
Interlocked Standard Weight with Liner Casing	For I.D.s 1/2" and up   Weight = [(0.097 x casing I.D.) + .018] x length (in inches)*

\* Calculated weight of casing is for preliminary estimate only. Actual weight of casing will depend on weight of strip or wire from which casing is made.

# Ordering Standard Flexible Shafts



If a standard Elliott component meets your application requirements, the information and charts in this handbook should allow you to make the proper selection. To order a standard flexible shaft assembly or coupling, determine the following:

- 1) Part Number
- 2) Core Diameter
- 3) Direction of Rotation
  - PR = Right hand power drive
  - PL = Left hand power drive, or
  - RC = Remote control or bi-directional
- 4) Length
- 5) Bore Diameters (for flex shaft assemblies)

If you have any questions, our technical experts can help you determine if a standard component will meet your needs. Should you require a custom design, we're ready to work with you to find the best solution. Simply contact us at +1 607-772-0404 or [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com).

## EXAMPLE

### How to Order a Coupling

You want to transmit 20 in.lbs. at 1000 rpm (.32 hp) through a 6" flexible straight coupling.

- 1) Begin by determining your core size in the charts on pages 10 and 11. This is 1/4".
- 2) Next, use the chart on page 18 to determine the maximum torque capacity of a 1/4" flexible coupling that is 6" long. This is 6.4 in.lbs.
- 3) Since this value is lower than required, you must either add casing or go to a larger shaft. This is 5/16" with a 24 in.lbs. capacity in a 6" length.





## CUSTOM SOLUTIONS

Elliott custom flexible shafts are designed to meet the exact requirements of your application. Using advanced design tools, 3-D modeling, state-of-the-art analysis, and rapid prototyping, our experienced engineers will work with you to develop a timely, cost-effective, efficient, and reliable solution to your power transmission challenges — no matter how demanding they may be.

## BUILT-IN QUALITY

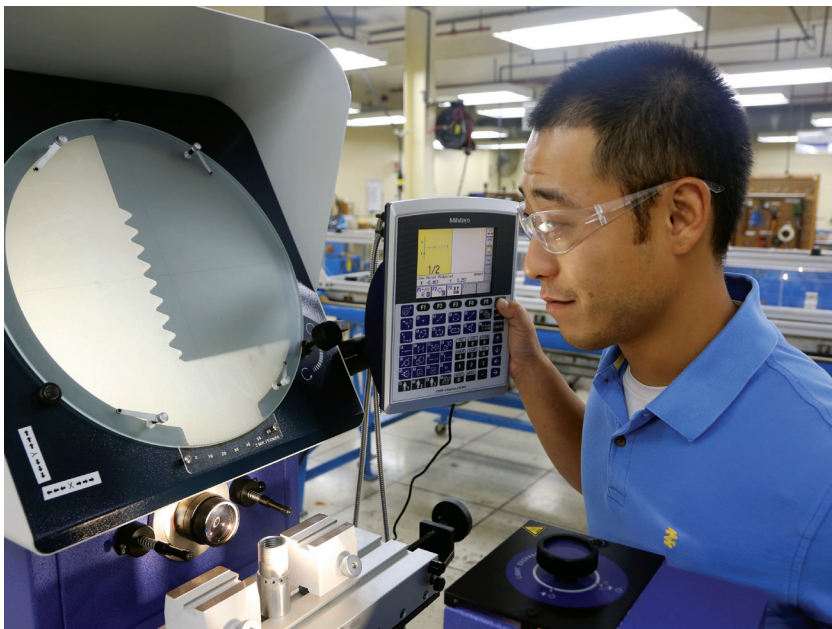
At Elliott, we understand how critical the performance of our flexible shafts are to the integrity of your equipment and to the safety and productivity of you and/or your customers. Our highly skilled team has access to industry-leading quality software and tools, best practice processes, and the latest field and lab testing capabilities to make sure you receive the best flexible shafts available today.

Did you  
know?

Elliott Manufacturing is  
ISO9001:2015 and AS9100D certified.



Elliott offers standard and custom flexible shaft solutions for just about any application. What problem can we solve for you? Contact us today at +1 607-772-0404 or [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com).





# Global Locations

## **Elliott Mfg. USA**

11 Beckwith Avenue  
Binghamton NY 13901  
Tel: +1 607 772 0404  
Email: [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com)

## **Elliott Mfg. Mexico**

Calle Neptuno No.1917  
Complejo Ind. Saragoza No. 3  
Col. Satellite C.P.32540  
Cd. Juarez, Mexico  
Tel: +1 915-791-0005 (from U.S.)  
+011-52-656 687-0905 (in Mexico)  
Email: [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com)

## **Elliott Mfg. Europe**

Unit 601, Axxess 10 Business Park  
Bentley Road South,  
Darlaston, West Midlands, WS10 BLQ  
United Kingdom  
Tel: +44 (0) 121 270 3913  
Email: [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com)

## **Turotest Medidores Ltda**

Avenida Luiz Merenda, 489 - Campanário  
Diadema-SP - CEP: 09931-390  
Tel: +55 (11) 4092-7200  
Email: [info@turotest.com.br](mailto:info@turotest.com.br)



For a custom flexible shaft solution, contact +1 607 772 0404 or [fssales@elliottmfg.com](mailto:fssales@elliottmfg.com).



© Elliott Manufacturing 2019 | All rights reserved. EM0101008-0919







# Flexible Rotary Power Transmission

## Solutions Guide

