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Why ESCODISC FIL?

The ESCOFIL is a state-of-the-art disc-type flexible coupling designed for extended life and built out of advanced composite material that confer unparalleled light weight, high strength, corrosion and ultra-violet resistance to the coupling.

The ESCOFIL coupling has been designed with the customer's interest in mind and it provides significant benefits over alternative transmission solutions.

Ease of installation

- Advanced composite materials offer high resistance for only 25% of the weight of steel. The coupling does not require the use of a crane to be mounted, which makes for very convenient installation and maintenance processes.
- The flexible elements have high misalignment capacity which facilitates assembly of the coupling on the installation.
- The flexible elements are unitized: no washers nor any other hardware to mess with during installation or maintenance.

Extended life and low cost of ownership

- The ESCOFIL coupling has been designed to offer superior strength and endurance: components are dimensioned for infinite life with high resistance against corrosion.
- Lubrication-free couplings such as the ESCOFIL greatly reduce the need for lengthy maintenance which in turn lowers costly production downtime for the installation.
- Because of its light weight, the coupling does not require intermediate bearing support, which improves cost of ownership for the end-user.

Strong influence on installation life extension

- The highly advanced composite materials that constitute the ESCOFIL coupling confer multiple features (e.g. light weight, low coefficient of thermal expansion) that help reduce vibrations and the load on bearings by up to 80%.

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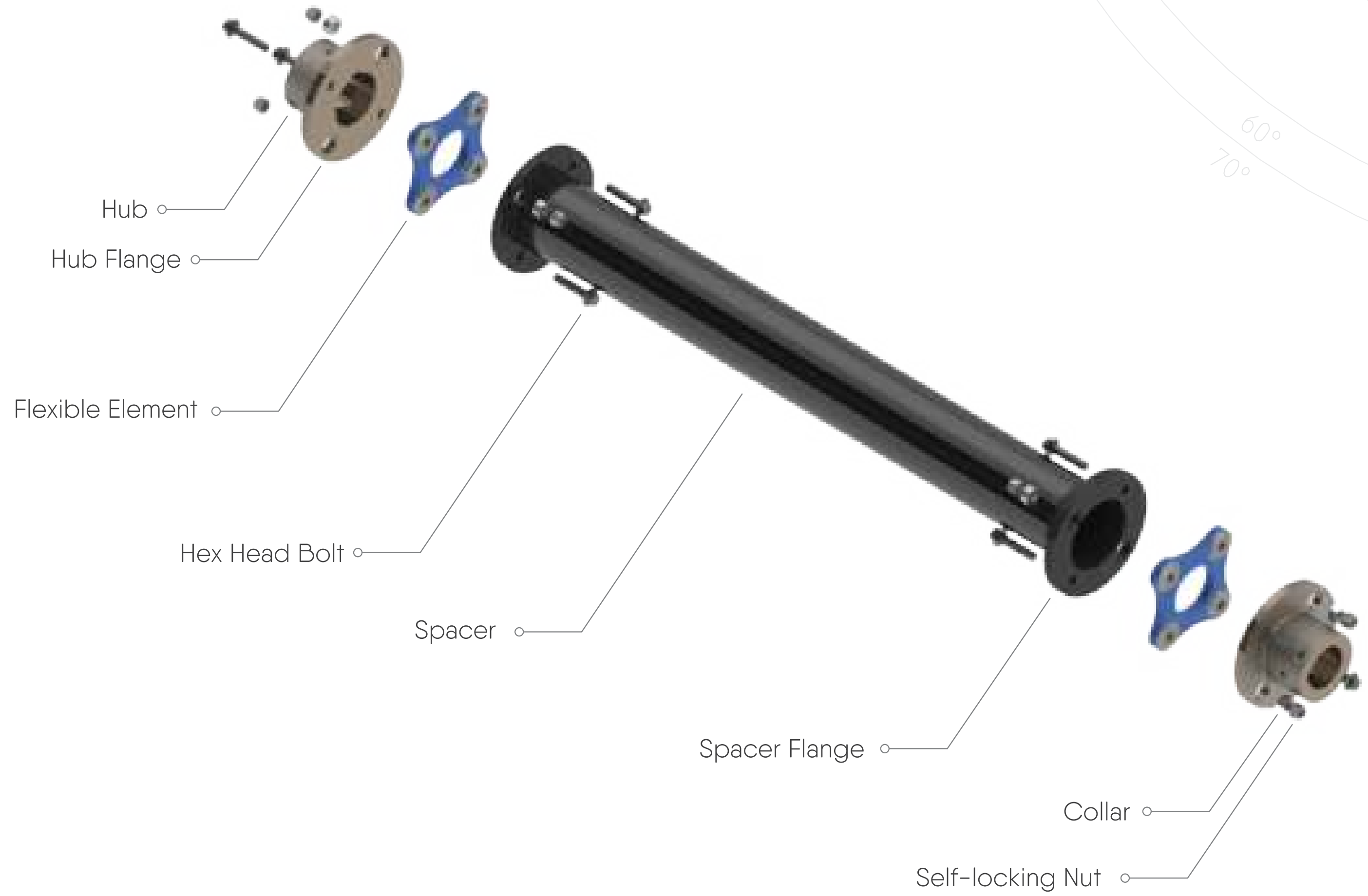

- The hubs, along with the fasteners, are made out of marine grade stainless steel (316) in order to provide increased protection against corrosion in aggressive environments.
- The floating spacer is built from carbon or glass (e-glass) fibres. This composite material is ingrained into an epoxy matrix. A carbon black additive is supplemented to the epoxy resin to provide ultra violet protection.
- The flexible elements are made from advanced high-strength composite disc-links and steel bushings, encapsulated in polyurethane. The combination of links and bushings into an aggregated single flexible element provides for improved handling and installation. Unitized elements also eliminates the risk of fretting corrosion. The high strength of the composite material ensures an extended life of the assembly at rated torque and misalignment values. The links come in 5 different sizes (for power ranging 75kW to 675 kW) and can accommodate for 1° misalignment per flexible element.
- The spacer flange is entirely made out of composite material and its interface with the spacer has been developed to maximize the longevity of the coupling. Poor design of this interface is indeed a common cause for failure of composite couplings. During the ESCOFIL DFCT design and testing phase, ESCO put a special focus in optimizing the spacer-flange interface.

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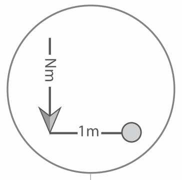
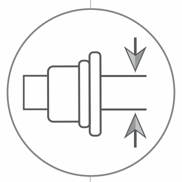
How to select the right coupling

Coupling size selection

① 

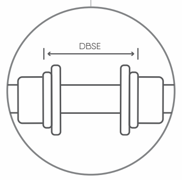
Select the size of ESCOFIL coupling that has the required torque capacity by comparing the figure in TABLE 2, Col. 2 (Max. continues Torque) with the figure obtained through to the following formula: T (Nm) =9550*p*Fu/n, with:

a. p, power in Kw
b. n, speed in rpm
c. Fu, safety factor, (dependant on the application, usually 2 for cooling tower applications)

② 

Make sure this coupling will accommodate the largest shaft diameter (see Technical Data TABLE 1 (General Dimensions), Col. 1 (Coupling size) & 2 (Max. Bore).

The coupling selected following ② Must have an equal or greater torque capacity than the Torque figure provided by equation ①. Should it not be the case, please select a coupling of a larger size from TABLE 1.

③ 

For the selected coupling size, identify in TABLE 1 the first spacer shaft type for which maximum Shaft End Separation (SES, TABLE 1, Col. 10 (Max SES)) exceeds the required SES for the application (often referred to as DBSE, distance between shaft ends). The coupling model will be designated by the combination of its max diameter and shaft type (e.g. 73 M3).

Example:
Motor Power: 50kW
Motor Speed: 1500rpm
Service Factor: 2 (for Cooling Tower)

T=9550 * 50 * 2/1500 = 764Nm
In TABLE 2, Col. 2 (Max. continues Torque), compare the obtained value 764 to the maximum continues torque ratings to find the first size that equals or exceeds this value. In this case the selection is E150.

Assembly weight

The weight of the total assembly is the sum of the shaft weight at minimum SES and the weight of the remaining length of the shaft.

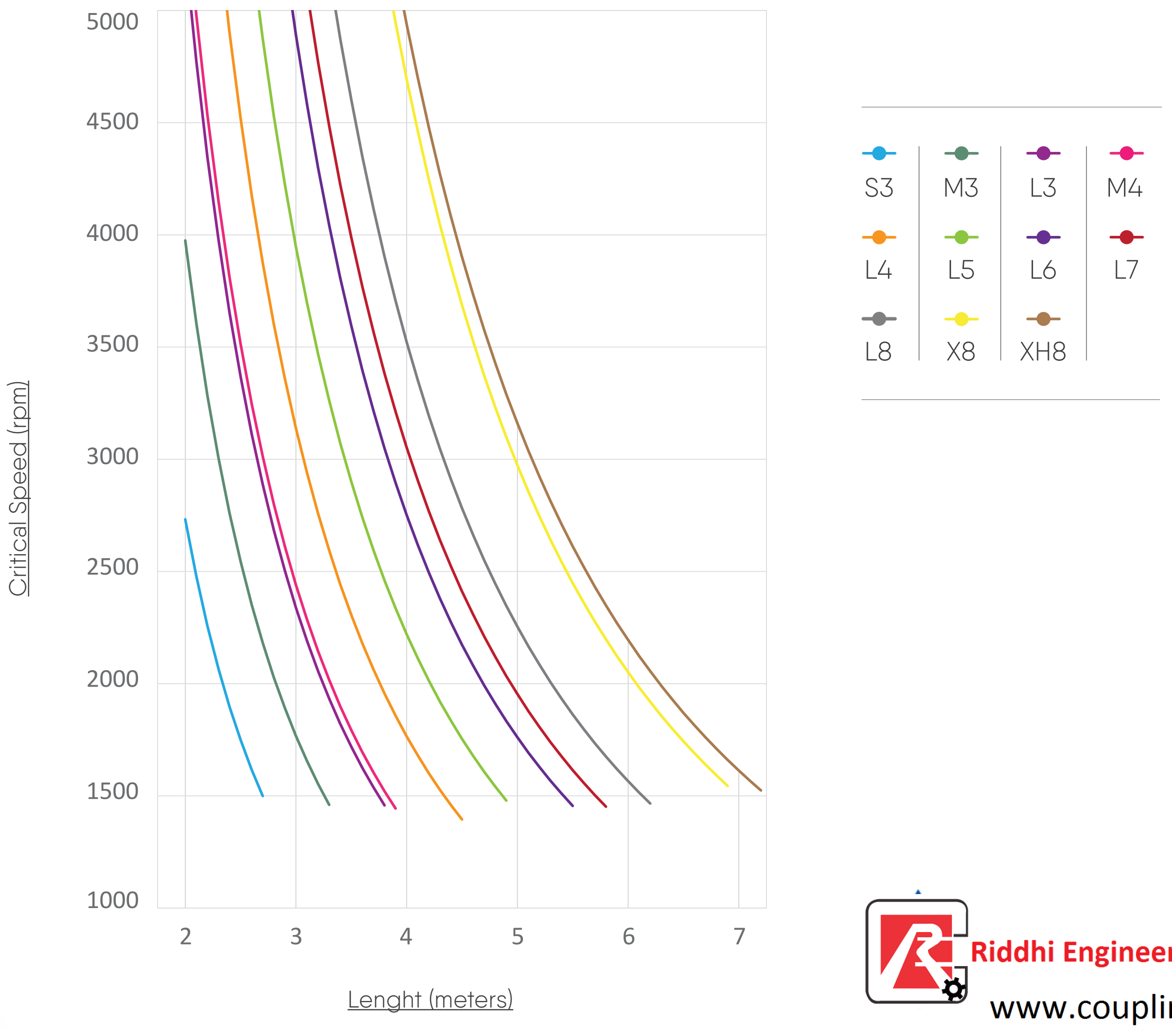
1. Based on coupling size (TABLE 1, Col. 1 (Coupling Size)) and coupling shaft type (TABLE 1, Col. 7 (Spacer Shaft)), locate the **weight at minimum SES** (TABLE 2, Col. 6 (Weight Min. SES)).
2. Calculate the **remaining length of the shaft**: Subtract the minimum SES (TABLE 1, Col. 9 (Min. SES)) from the actual total required SES.
3. Calculate the **weight of the remaining length of the shaft**: multiply the length calculated in point 2. by the weight change per length (TABLE 2, Col. 7 (Weight changes per length)).
4. Add the weight at minimum SES (point 1.) to the weight of the remaining length of the shaft (point 3.) to get the **total weight of the shaft**.

Assembly Inertia

Apply the same method then for the calculation of the weight of the assembly but use the inertia at minimum SES (TABLE 2, Col. 8 (Wr^2 @ Min. SES)) and the inertia changes per length (TABLE 2, Col. 9 (Wr^2 Change per Length)) instead of the weight (changes).

Floating spacer shaft critical speed

The critical speed of the floating spacer shaft can be determined from the chart below. Once you know the spacer shaft designation (i.e. L4) and the SES you can plot the point on the chart to determine the critical speed. For example, if the SES is 3 m and spacer shaft is L4 find the intersection of x axis at 3 m with the curve of L4 and read the critical speed on the y axis. In this example the value is 3100 cycles per minutes.



To be in line with guidelines of Cooling Tower Technology Institute, add an additional safety factor of 1.3 to determine the critical speed.

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Technical data

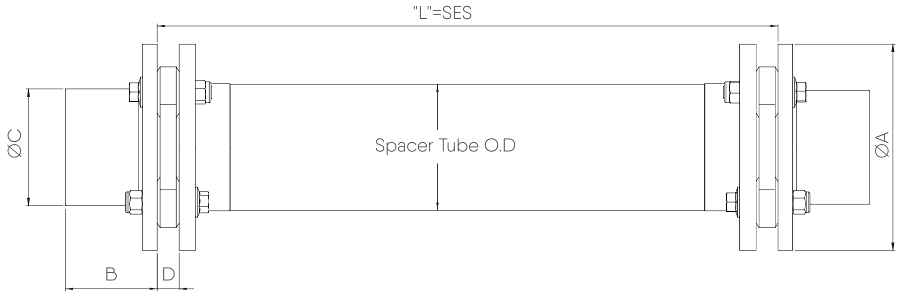

TABLE 1 - General Dimensions in mm (inch)									
Coupling Size	Max. Bore	A	B	C	D	Spacer Shaft	Spacer Tube O.D	Min. SES L	Maximum SES @1800/1500 [1] rpm
E75	54 (2.12)	133.35 (5.25)	57.15 (2.25)	74.4 (2.93)	12.7 (0.5)	S3	81 (3.2)	229 (9)	2050 (80)/2330 (92)
E75	54 (2.12)	133.35 (5.25)	57.15 (2.25)	74.4 (2.93)	12.7 (0.5)	M3	81 (3.2)	229 (9)	2540 (100)/2794 (110)
E150	73 (2.87)	133.35 (5.25)	57.15 (2.25)	74.4 (2.93)	12.7 (0.5)	S3	81 (3.2)	229 (9)	2050 (80)/2330 (92)
E150	73 (2.87)	133.35 (5.25)	57.15 (2.25)	74.4 (2.93)	12.7 (0.5)	M3	81 (3.2)	229 (9)	2540 (100)/2794 (110)
E150	73 (2.87)	133.35 (5.25)	57.15 (2.25)	74.4 (2.93)	12.7 (0.5)	L3	81 (3.2)	229 (9)	2870 (113)/3125 (125)
E225	101 (4)	178.56 (7.03)	79.5 (3.13)	98.55 (3.88)	16 (0.63)	M4	108 (4.25)	305 (12)	3022 (119)/3327 (131)
E225	101 (4)	178.56 (7.03)	79.5 (3.13)	98.55 (3.88)	16 (0.63)	L4	108 (4.25)	305 (12)	3454 (136)/3784 (149)
E225	101 (4)	178.56 (7.03)	79.5 (3.13)	98.55 (3.88)	16 (0.63)	L5	135 (5.31)	305 (12)	3886 (153)/4267 (168)
E225	101 (4)	178.56 (7.03)	79.5 (3.13)	98.55 (3.88)	16 (0.63)	L6	160 (6.28)	305 (12)	4267 (168)/4673 (184)
E300	101 (4)	178.56 (7.03)	79.5 (3.13)	111.25 (4.38)	19 (0.75)	L4	108 (4.25)	305 (12)	3454 (136)/3784 (149)
E300	101 (4)	178.56 (7.03)	79.5 (3.13)	111.25 (4.38)	19 (0.75)	L5	135 (5.31)	305 (12)	3886 (153)/4267 (168)
E300	101 (4)	178.56 (7.03)	79.5 (3.13)	111.25 (4.38)	19 (0.75)	L6	160 (6.28)	305 (12)	4267 (168)/4673 (184)
E675	106 (4.19)	241.3 (9.50)	95.25 (3.75)	139.7 (5.50)	19 (0.75)	L6	160 (6.28)	356 (14)	4267 (168)/4673 (184)
E675	106 (4.19)	241.3 (9.50)	95.25 (3.75)	139.7 (5.50)	19 (0.75)	L7	186 (7.3)	356 (14)	4597 (181)/5029 (198)
E675	106 (4.19)	241.3 (9.50)	95.25 (3.75)	139.7 (5.50)	19 (0.75)	L8	211 (8.3)	356 (14)	4902 (193)/5359 (211)
E675	106 (4.19)	241.3 (9.50)	95.25 (3.75)	139.7 (5.50)	19 (0.75)	X8	211 (8.3)	356 (14)	5384 (212)/5892 (232)
E675	106 (4.19)	241.3 (9.50)	95.25 (3.75)	139.7 (5.50)	19 (0.75)	XH8	211 (8.3)	356 (14)	5740 (226)/6299 (248)

[1] Maximum S.E.S. is defined based on a 1.3 minimum critical speed safety factor, following Cooling Technology Institute, chapter 10 specifications.

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TABLE 2 - Engineering Data									
Coupling Size	Max. continues Torque Nm (lb-in) @ 1.0 sf	Peak Overload Torque Nm (Lb-in)	Axial capacity per END mm (in)	Spacer Shaft	Weight @ Min. SES Kg (Lb)	Weight changes per length (Kg/m) (lb/in)	Wr^2 @ Min.SES Kg-m^2 (lb-in^2)	Wr^2 Change per Length Kg-m^2 (lb-in^2)
E75	400 (3540)	800 (7080)	0.75 (0.03)	S3	5.9 (13.1)	1.875 (0.105)	0.010 (35)	0.0025 (0.218)
E75	400 (3540)	800 (7080)	0.75 (0.03)	M3	5.89 (13)	1.58 (0.089)	0.010 (35)	0.0021 (0.185)
E150	800 (7080)	1625 (14382)	0.75 (0.03)	S3	5.26 (11.6)	1.875 (0.105)	0.009 (33)	0.0025 (0.218)
E150	800 (7080)	1625 (14382)	0.75 (0.03)	M3	5.2 (11.5)	1.58 (0.089)	0.009 (33)	0.0021 (0.185)
E150	800 (7080)	1625 (14382)	0.75 (0.03)	L3	5.12 (11.3)	1.125 (0.063)	0.009 (32)	0.0015 (0.131)
E225	1220 (10800)	2440 (21600)	1 (0.04)	M4	14.2 (31.4)	2.75 (0.154)	0.0392 (134)	0.0076 (0.666)
E225	1220 (10800)	2440 (21600)	1 (0.04)	L4	14 (31)	1.96 (0.11)	0.0386 (132)	0.0054 (0.472)
E225	1220 (10800)	2440 (21600)	1 (0.04)	L5	16.2 (35.7)	2.4 (0.136)	0.0474 (162)	0.010 (0.902)
E225	1220 (10800)	2440 (21600)	1 (0.04)	L6	18.8 (41.6)	2.9 (0.162)	0.0626 (214)	0.017 (1.536)
E300	1625 (14385)	3250 (28764)	1 (0.04)	L4	16.2 (35.8)	1.96 (0.11)	0.0386 (132)	0.0054 (0.472)
E300	1625 (14385)	3250 (28764)	1 (0.04)	L5	18.4 (40.5)	2.4 (0.136)	0.0474 (162)	0.010 (0.902)
E300	1625 (14385)	3250 (28764)	1 (0.04)	L6	20.9 (46.2)	2.9 (0.162)	0.0626 (214)	0.017 (1.536)
E675	3672 (32500)	7344 (65000)	1.25 (0.05)	L6	31.5 (69.5)	2.9 (0.162)	0.18 (630)	0.017 (1.536)
E675	3672 (32500)	7344 (65000)	1.25 (0.05)	L7	35.3 (77.8)	3.37 (0.189)	0.21 (735)	0.027 (2.413)
E675	3672 (32500)	7344 (65000)	1.25 (0.05)	L8	39.6 (87.4)	3.8 (0.215)	0.26 (896)	0.041 (3.573)
E675	3672 (32500)	7344 (65000)	1.25 (0.05)	X8	39.6 (87.4)	3.8 (0.215)	0.26 (896)	0.041 (3.573)
E675	3672 (32500)	7344 (65000)	1.25 (0.05)	XH8	39.6 (87.4)	3.8 (0.215)	0.26 (896)	0.041 (3.573)

All couplings are dynamically balanced to meet ISO 1940/1 G6.3 grade specifications.

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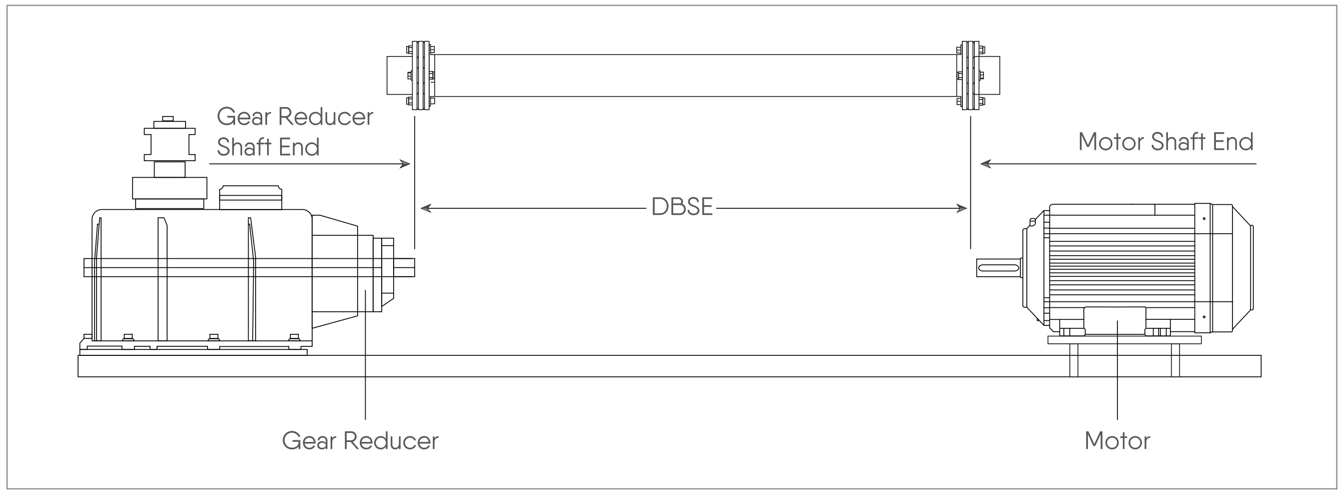
Application data sheet

Motor parameters	
Motor horsepower (kW):	
Motor speed (rpm):	
Motor type:	
Motor shaft diameter (mm):	
Motor shaft keyway size:	

Gearbox parameters	
Gearbox ratio:	
Gearbox input shaft diameter (mm):	
Gearbox shaft keyway size:	
Gearbox type:	

Fan parameters	
Fan speed (rpm):	
Fan number of blades:	

Application parameters	
Application type:	
Application Service Factor:	



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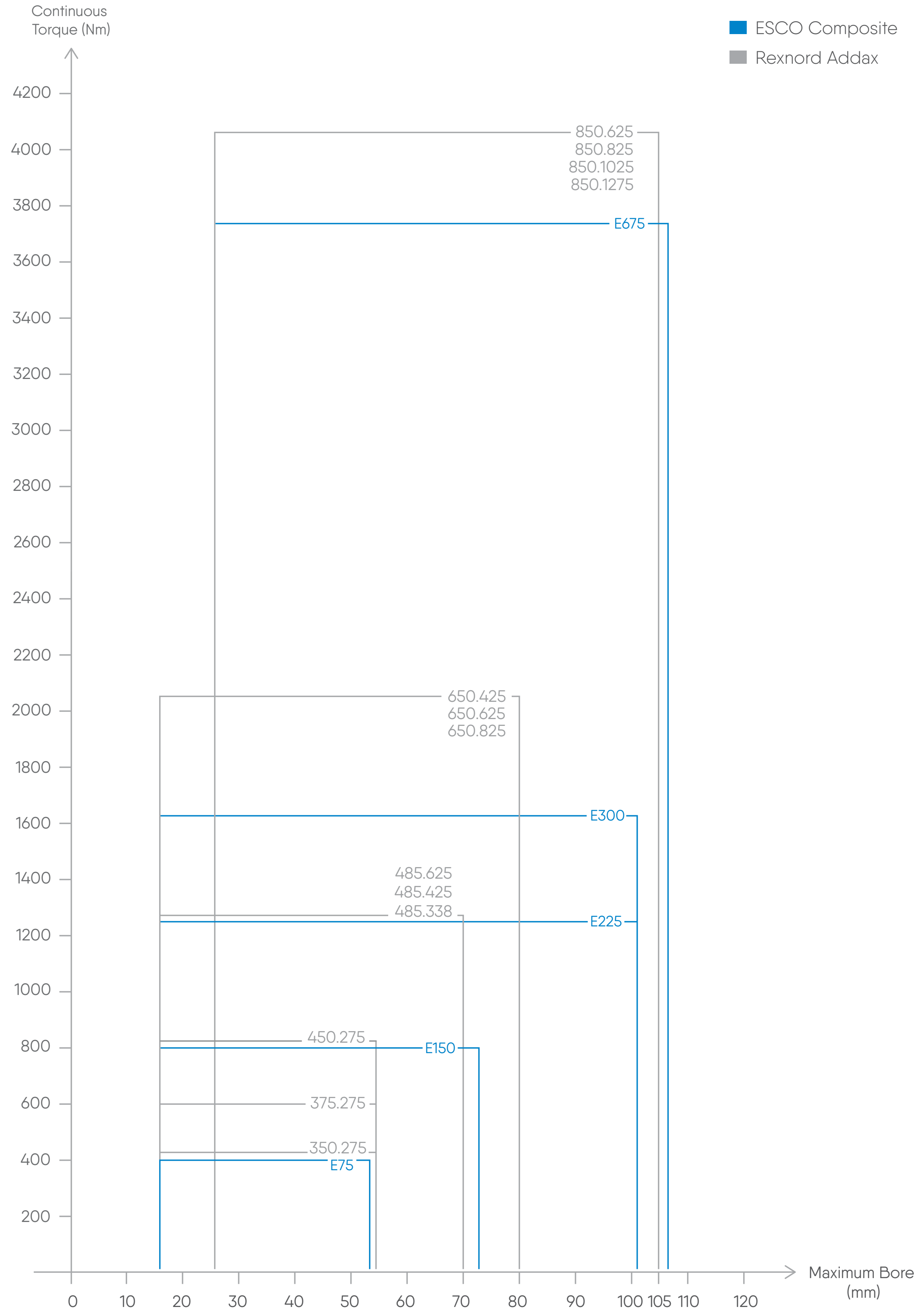
Equivalence chart based on torque ratings and maximum bore



The equivalence chart provides a quick indication about which DFCT coupling may suit your needs. It does however not replace a proper selection process. Please contact ESCO for more information on selecting the best coupling for your application.

Much more than products

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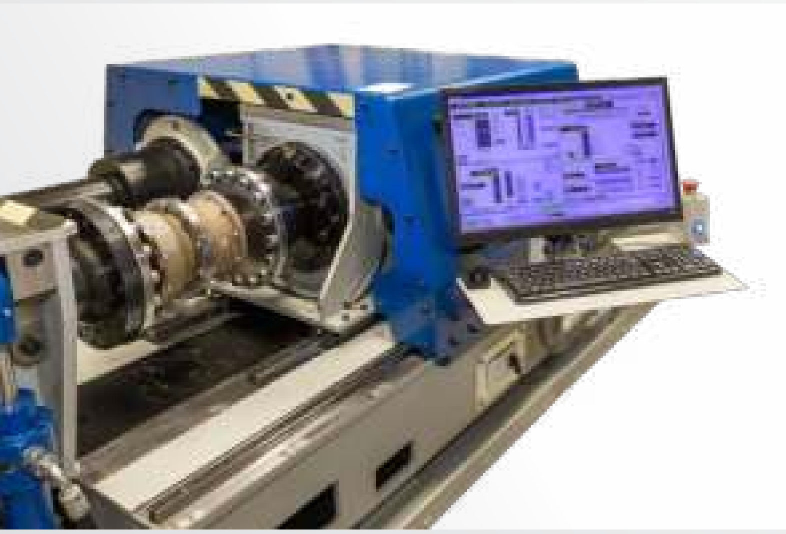

We have spent the last 50 years building our expertise.
Our engineering team is equipped to design and test a wide range of coupling solutions. Please contact us, we will design the right coupling for your application.

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Our relationship with customers does not stop once couplings are delivered. We have a team of experienced people ready to perform service on the field, repair, inspections, testing... We can also do the maintenance on our couplings for you. This guarantees proper execution of the maintenance instructions and contributes to improving the lifetime of your application.

CERTIFIED ISO 9001:2015 COMPANY

Once we get involved into a specific sector, we make sure to embrace the quality standards that the market requires. This is why, we are ISO 9001 certified.

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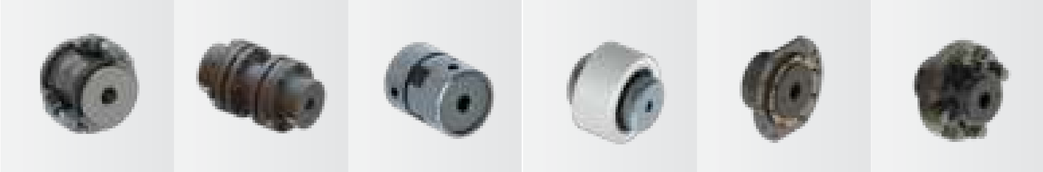
A global footprint, with a family of 9 companies located all across the world

9 offices across the world

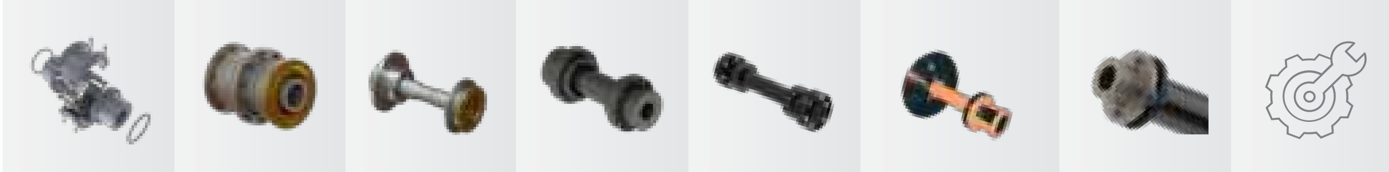
4 manufacturing sites

- ESCO Couplings N.V.
  Diegem, Belgium
- ESCO Couplings & Transmissions Pvt. Ltd.
  Bengaluru, India
- ESCO Couplings Ltd.
  Jinan, China
- André De Decker & Fils S.A.
  Saintes, Belgium
- ESCO Power N.
  Saintes, Belgiur
- ESCO Aandrijvingen B.V.
  Alphen A/D Rijn, The Netherlands
- ESCO Antriebstechnik GmbH
  Troisdorf, Germany
- ESCO Drives N.V.
  Diegem, Belgium
- ESCO Transmissions SAS
  Saint Witz, France

ESCO couplings product range



Product Line		F/C/N	D	Flex	Nyl	FWD	FET
Product Technology/Type		Gear	Disc	Elastic	Elastic	Gear (Barrel Equivalent)	Gear (with Torque Limiter)
	General Industry	⊙	⊙	⊙	⊙	⊙	⊙
	Metals & Mining	⊙	⊙	⊙	⊙	⊙	⊙
	Crane & Hoisting	⊙	⊙			⊙	⊙
	Power Generation	⊙	⊙				
	Oil & Gas	⊙	⊙				⊙
	Marine	⊙	⊙				
	Cooling Towers						
	Railway – High-speed, Intercity, Metro						
	Railway – Tram		⊙				
	Wind Power Generation	⊙	⊙				



Product Line	Grid	FTRN*	(D)FTRN(FS)*	High Speed	High Speed	FWMO*	DWMO*	Composite	Service
Product Technology/Type	Grid	Gear	Gear/Disc	Gear	Disc	Gear	Disc	Composite	Engineering, Repair, Maintenance
General Industry	⊙							⊙	⊙
Metals & Mining	⊙							⊙	⊙
Crane & Hoisting	⊙								⊙
Power Generation				⊙	⊙			⊙	⊙
Oil & Gas	⊙			⊙	⊙			⊙	⊙
Marine								⊙	⊙
Cooling Towers								⊙	⊙
Railway – High-speed, Intercity, Metro		⊙							⊙
Railway – Tram		⊙	⊙						⊙
Wind Power Generation						⊙	⊙		⊙

*Available with torque limiter

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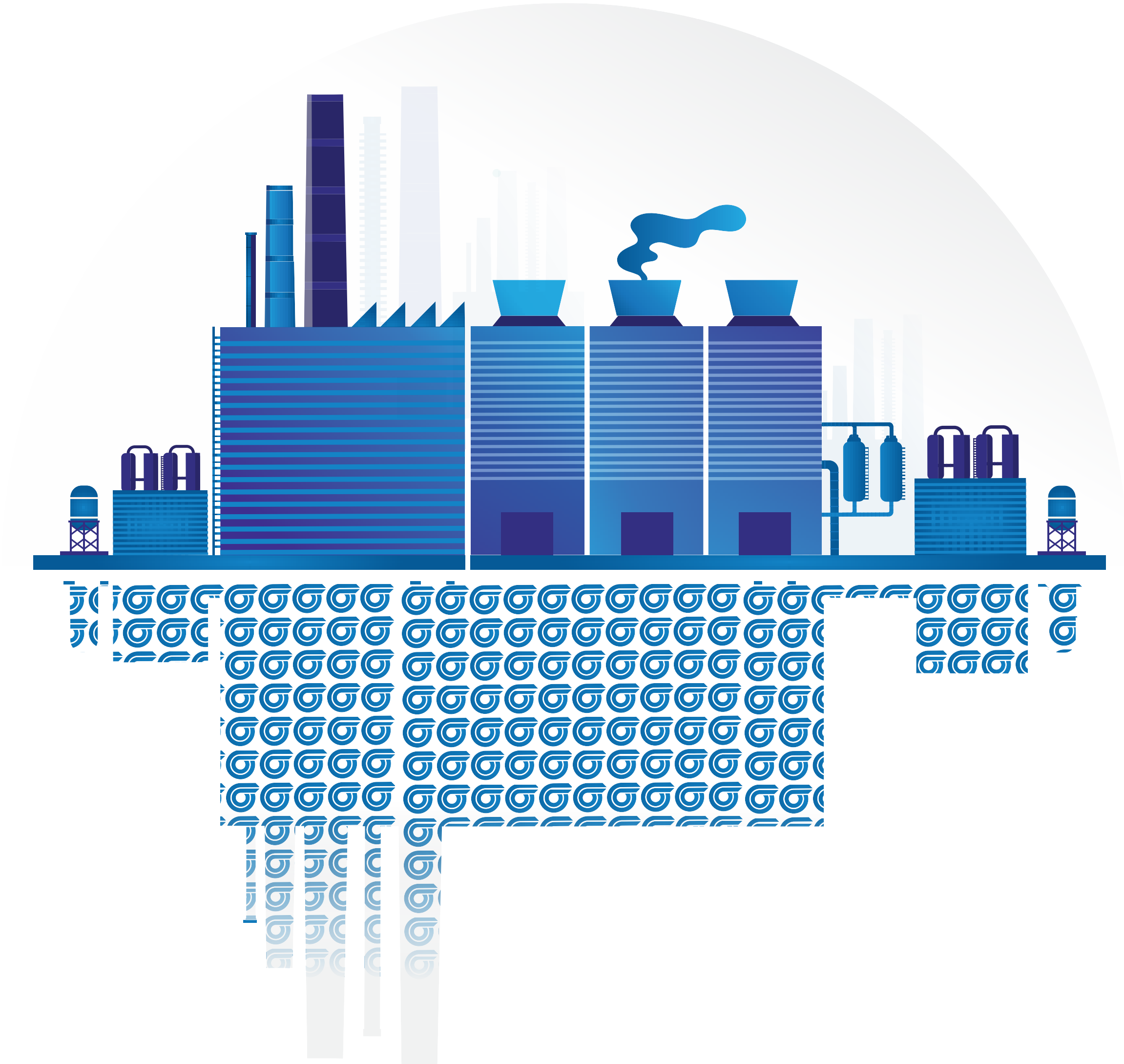

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