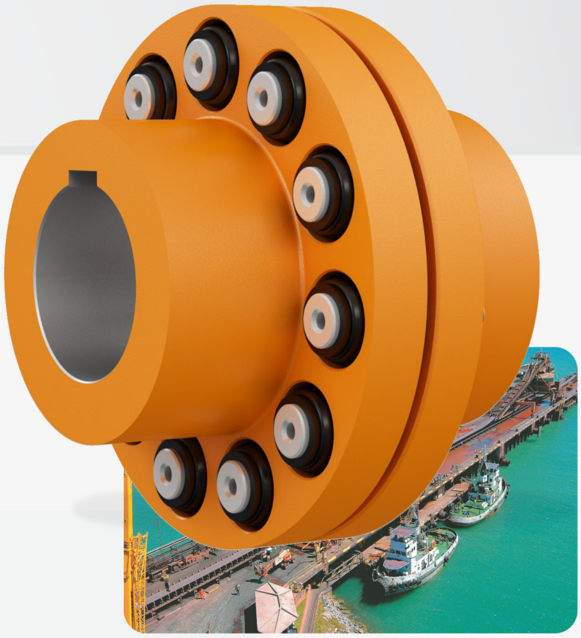
Henfel

SOLUTIONS FOR DRIVE SYSTEMS



Technical Catalog

FLEXIBLE COUPLING

HENFLEX HDF

HENFLEX HXP

Operating since 1981 installed in the city of Jaboticabal, Sao Paulo State, Brazil, Henfel Indústria Metalúrgica Ltda manufactures Bearing Housings, Hydrodynamic Couplings, Variable Speed Hydrodynamic Couplings and Flexible Couplings. These products are applied to many kinds of equipments and bulk material handling systems of industrial sectors such as mining, ports, steel, paper and cellulose, sugar, and alcohol, among others.

Installed in an area of 25 thousand square meters, the company has a vertical production structure, and, therefore has most of the transformation technology needed for the manufacturing of its products. Its methods and processes are monitored by quality management system certified by the ISO 9001:2008 standard, which assures the manufacturing of high quality products.

The Professional environment at Henfel encourages collaboration, team work and development of leaderships able of taking decisions and creating solutions, which impacts the service quality. An example of it is the organizational identity of the company, developed and established by its collaborators during the strategic planning of 2010, and that contemplates the Values that guide the relationships in all the company's hologram, its Mission, and Vision.

Values: Responsibility, respect, honesty, team work, excellence, commitment, ambition, courage, and discipline.

Mission: To provide solutions that allow customers to gain competitive advantages required to leverage and consolidate their businesses. To promote and encourage the development of its employees, and work with social and environmental responsibility. To make the results bring fair return for their investors and employees.

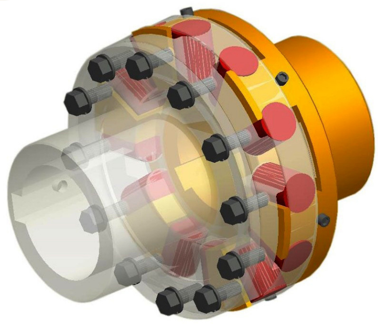
Vision: To serve with excellence, providing innovative solutions in order to obtain customer's satisfaction and loyalty, solid growth, job creation and sustainable development.

Concerned about the environment preservation, the company keeps works policies with the perspective of minimizing the impacts of its productive activities in the internal and external environments. Internally, equipments that allow the maximum reuse of the generated waste are used, allowing for a lower amount of waste. The correct analysis and characterization of the remaining waste contributes for this waste to be stored in proper places and authorized by the proper agencies, avoiding, thus, any contact and possibility of contamination.

Social responsibility is also part of the Henfel managers agenda. Therefore, investments programs are kept with entities that work in the children care and education in a national and local scope.

Developed considering the most up to date application engineering concepts and highly advanced 3D project techniques, these couplings provide efficient torque transmission through the compression of the elastic elements. These elastic elements also absorb vibrations and shocks coming from both the driving and driven machines and they compensate angular, radial and axial misalignments.

Composed by ductile iron parts and polyurethane elastic elements resistant to the most aggressive environments, they can be applied in places with temperatures ranging between -30ºC and 85º C. Also, the ease of installation and maintenance simplicity are characteristics that complement the feasibility of this line.
The Henflex HDF Flexible Couplings are available in many sizes, for shaft diameters between 25 and 600mm, with load capacities of up to 1.417.600 Nm. In order to attend a wide range of applications and project needs, 5 different constructive forms with interchangeable elements were designed. For greater values, Henfel's engineering department must be consulted.



Dimensioning

First of all, define the operational torque given by the equation bellow:

$$T_0 = \frac{C \times P}{n_m}$$

Where:
T_0 = System operational torque [Nm];
P = Input power [kW or HP];
n_m = Rotation speed [rpm];
C:
C = 9550 for power in kW;
C = 7030 for power in HP.

From the operational torque, the coupling's nominal torque is obtained (T_{na}), which is given by:
$T_{na} \geq T_0 \times f_1$

Where:
T_{na} =Coupling nominal torque;
f_1 = Service factor (see table on page 4).

The service factor is a number obtained empirically that takes into account the operating regimes of the driving and driven machines.

The table below indicates the service factor considering the driven machine regimen and the drive type. In order to simplify the service conditions they were divided into three groups:

1. Service condition with uniform load;
2. With medium shocks;
3. With strong shocks;

With the F_1 value established, it is possible to determine the T_{na} value. By comparing the value with the ones on the dimensional tables, it's possible to find out the coupling size.

Attention

The selection methods presented above are only valid if the environmental temperature where the coupling is applied ranges between -30°C and 85°C, with alignment as shown in the manual, with no more than 20 start ups per hour.

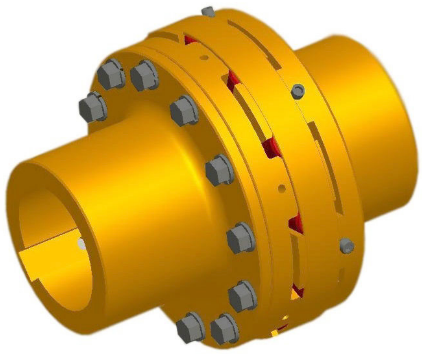
For tougher applications or if you have any questions, please contact our engineering department.

It's also important to consider the shaft dimensions of the driving and driven machines as well as the admissible rotation speed of the couplings.

Service Factors

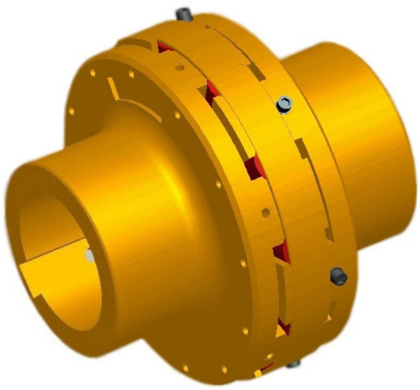
Load type		Drive		
		Electric motor	4-6 cylinders internal combustion enginees	1-3 cylinders internal combustion enginees
Uniform load	- Fans P/n=0,1; - Centrifugal pumps (low viscosity); - Screw pumps; - Electric generators	2.0	2.4	2.6
Medium shocks	- Blowers and fans P/n>0,1; - Belt conveyors and chain conveyors; - Bucket elevators; - Hoisting gears; - Agitators ,Centrifuges, Mixers; - Concrete mixers; - Washing machines; - Wood working machines; - Plastic calenders, extruders and mixers; - Metal working machines - Metal planing machines; - Marine propeller; - Kilns.	2.2	2.8	3.2
Strong shocks	- Generators and transformers; - Piston pumps; - Mills; - Breakers; - Sugarcane crushing equipments; - Sugarcane chippers; - Defibrator; - Sugarcane apron feeder; - Cylinders and rotary kilns; - Paper machines; - Cranes; - Bucket wheel reclaimer; - Metal rolling mills equipments; - Rubber mixers and extruders; - Elevators.	2.6	3.5	4

*For other equipments and applications, please consult our application engineering department.



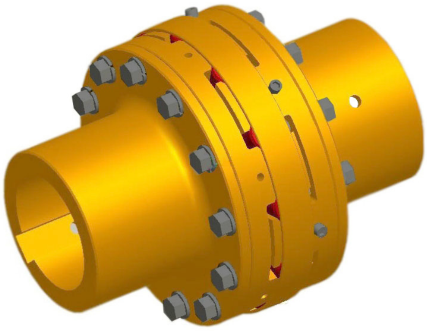
HDF

Used in applications with small gap between the shafts of the driving and driven machines. It's composed by a hub with jaws, an additional hub, a flange with jaws and elastic elements radially assembled between the jaws. t's possible to remove the driving and driven machines radially, and it's not necessary to move them in order to replace the elastic elements.



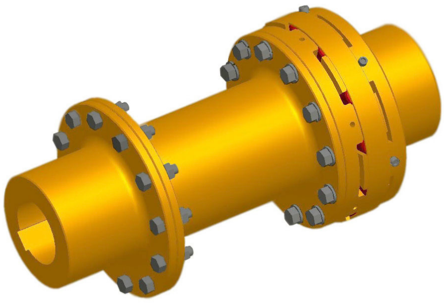
HDFS

Basic coupling, composed by two equal hubs with jaws, with elastic elements radially assembled between them. It's used in applications where the gap between the shafts of the driving and driven machines are small. It's not possible to remove the hubs radially, however, it's possible to replace the elastic elements without the need to displace the hubs.



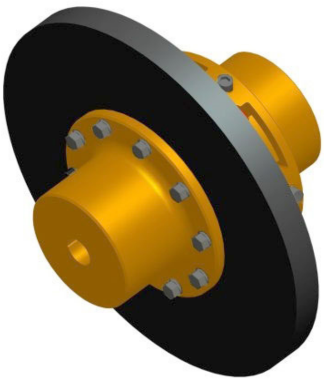
HDFF

This model is derived from the HDF constructive form. Consists of two hubs, two flanges with jaws, and elastic elements assembled radially between the jaws. It's possible to remove the driving and driven machines radially, and it's not necessary to displace them in order to replace the elastic elements. One of the greatest advantages of this model is that in case of an accident that causes damage to the jaws, it's possible to replace the flanges with jaws without removing the hubs that are assembled on the shafts of the driving and driven machines.



HDFC

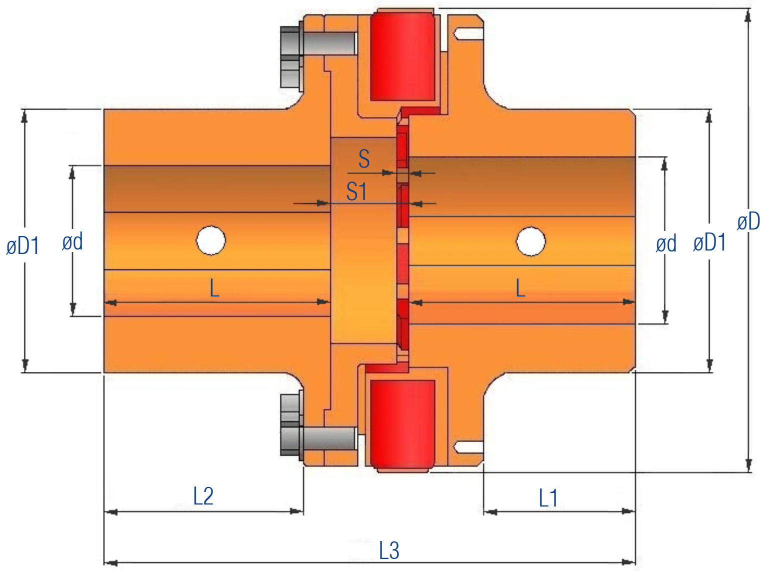
This model is derived from the HDF constructive form and it's indicated for applications that require a larger gap than the ones from the HDF and HDFF models. It's pretty similar to the HDF model, except for the radially removable spacer tube. It's possible to remove the driving and driven machines radially, and it's not necessary to move them in order to replace the elastic elements.



HDFD

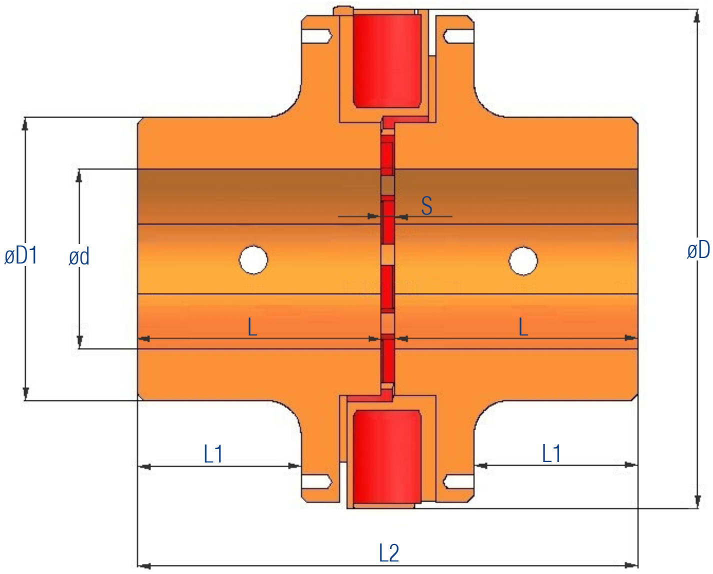
This model is derived from the HDF constructive form, with the inclusion of a brake disc. It's possible to remove the driving and driven machines radially, and it's not necessary to displace them in order to replace the elastic elements or the brake disc.

Dimensional HDF



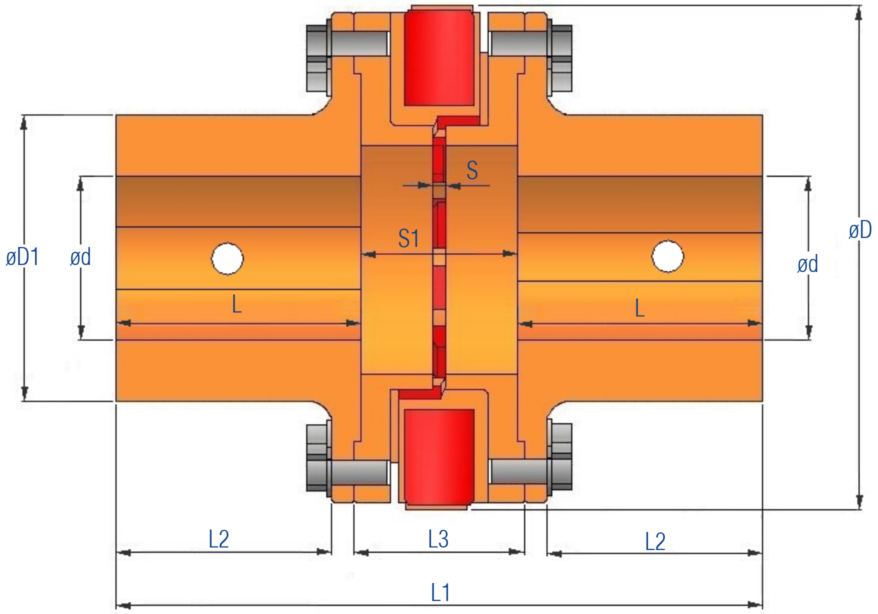
HDF															
Size	Max moment (Nm)	max n (rpm)	d min	d max	D	D1	L3	L	L1	L2	S	S1	Screw	J (kgm²)	Weight (w/ min. shaft dim.)
220	9.900	6000	25	90	220	130	236	100	64	83,5	8	36	M12	0,16	31
270	13.700	2600	30	95	265	135	315	130	82	107	10	55	M18	0,38	55
330	28.500	2100	45	125	325	180	384	160	103	135	10	64	M18	1,31	102
380	48.500	1950	80	150	375	215	424	180	121	154	10	64	M18	1,68	142
430	71.800	1800	100	180	425	250	451	190	124	161	10	71	M20	3,22	200
480	96.700	1600	115	210	475	290	471	200	131	171	10	71	M20	7,61	270
540	145.700	1350	140	220	535	310	539	228	155	195	14	83	M24	11,05	355
590	186.900	1250	150	260	585	365	539	228	152	195	14	83	M24	16,4	464
640	233.150	1100	155	290	635	405	604	258	180	222	14	88	M30	22,65	630
690	278.800	1000	165	310	685	435	609	258	174	222	14	93	M30	33,9	745
750	378.900	950	190	340	750	470	698	298	205	262	14	102	M30	47,15	960
850	556.300	890	205	400	850	560	778	338	235	298	14	102	M30	110,8	1470
950	766.600	800	225	470	950	660	784	338	218	297	14	108	M36	160,5	2050
1050	924.000	700	250	525	1050	730	870	375	250	328	14	120	M36	335,5	2730
1250	1.417.600	600	300	600	1250	840	925	400	265	346	16	125	M36	595,6	3990

Dimensional HDFS



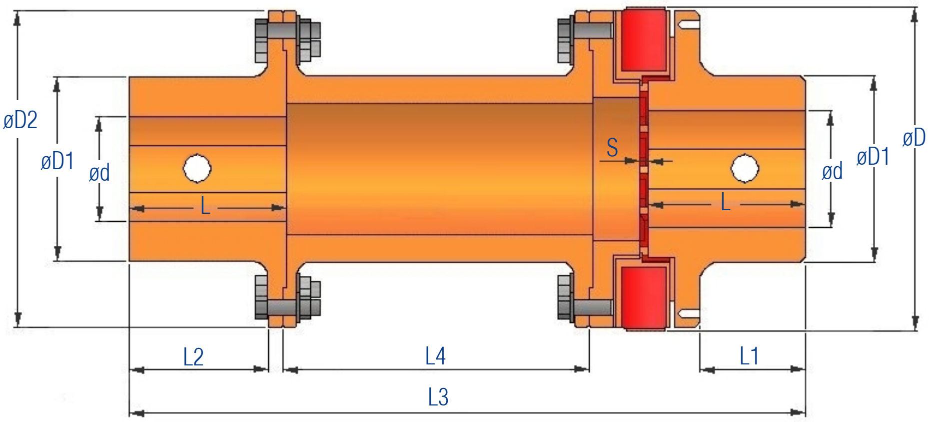
HDFS												
Size	Max moment (Nm)	Max rotation (rpm)	d min	d max	D	D1	L	L1	L2	S	J (kgm²)	Weight (w/ min. shaft dim.)
220	9.900	6000	25	90	220	130	100	64	208	8	0,14	26
270	13.700	2600	30	95	265	135	130	82	270	10	0,32	47
330	28.500	2100	45	125	325	180	160	103	330	10	1,11	87
380	48.500	1950	80	150	375	215	180	121	370	10	1,43	121
430	71.800	1800	100	180	425	250	190	124	390	10	2,74	170
480	96.700	1600	115	210	475	290	200	131	410	10	6,47	230
540	145.700	1350	140	220	535	310	228	155	470	14	9,39	302
590	186.900	1250	150	260	585	365	228	152	470	14	13,94	394
640	233.150	1100	155	290	635	405	258	180	530	14	19,25	536
690	278.800	1000	165	310	685	435	258	174	530	14	28,82	633
750	378.900	950	190	340	750	470	298	205	610	14	40,08	816
850	556.300	890	205	400	850	560	338	235	690	14	94,18	1250
950	766.600	800	225	470	950	660	338	218	690	14	136,43	1743
1050	924.000	700	250	525	1050	730	375	250	764	14	285,18	2321
1250	1.417.600	600	300	600	1250	840	400	265	816	16	506,26	3392

Dimensional HDFF



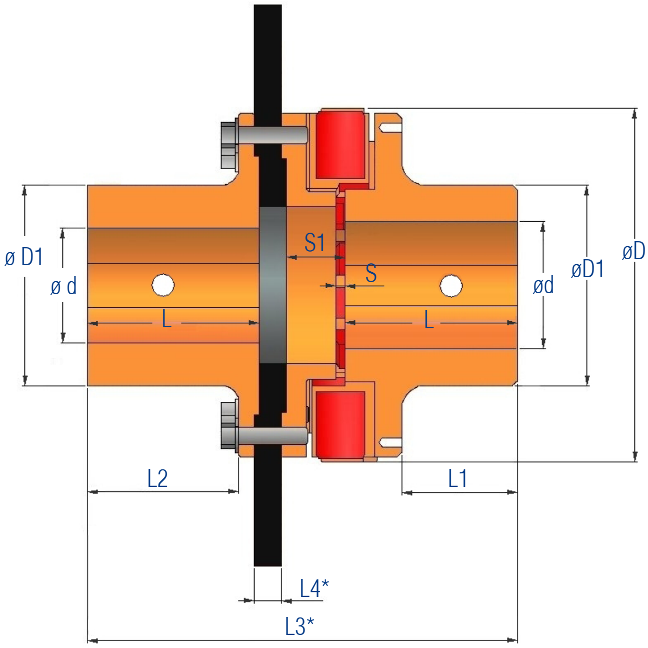
HDFF															
Size	Max moment (Nm)	Max rotation (rpm)	d min	d max	D	D1	L1	L3	L	L2	S	S1	Screw	J (kgm²)	Weight (w/ min. shaft dim.)
220	9.900	6000	25	90	220	130	264	71	100	83,5	8	64	M12	0,15	29
270	13.700	2600	30	95	265	135	360	108	130	107	10	100	M18	0,36	52
330	28.500	2100	45	125	325	180	438	126	160	135	10	118	M18	1,24	97
380	48.500	1950	80	150	375	215	478	128	180	154	10	118	M18	1,6	135
430	71.800	1800	100	180	425	250	512	144	190	161	10	132	M20	3,06	190
480	96.700	1600	115	210	475	290	532	144	200	171	10	132	M20	7,23	257
540	145.700	1350	140	220	535	310	608	166	228	195	14	152	M24	10,5	337
590	186.900	1250	150	260	585	365	608	166	228	195	14	152	M24	15,58	441
640	233.150	1100	155	290	635	405	678	176	258	222	14	162	M30	21,52	599
690	278.800	1000	165	310	685	435	688	186	258	222	14	172	M30	32,21	708
750	378.900	950	190	340	750	470	786	204	298	262	14	190	M30	44,79	912
850	556.300	890	205	400	850	560	866	204	338	298	14	190	M30	105,26	1397
950	766.600	800	225	470	950	660	878	216	338	297	14	202	M36	152,48	1948
1050	924.000	700	250	525	1050	730	976	246	375	328	14	226	M36	318,73	2594
1250	1.417.600	600	300	600	1250	840	1034	254	400	346	16	234	M36	565,82	3791

Dimensional HDFC



HDFC																		
Size	Max moment (Nm)	Max rotation (rpm)	d min	d max	D	D1	D2	L3 min	L3 max	L4 min	L4 max	L	L1	L2	S	Screw	J (kgm²)	Weight (w/ min. shaft dim.)
220	9.900	6000	25	90	220	130	210	342	452	90	200	100	64	84	8	M12	0,18	36
270	13.700	2600	30	95	265	135	255	455	575	120	240	130	82	107	10	M18	0,44	63
330	28.500	2100	45	125	325	180	315	534	704	130	300	160	103	135	10	M18	1,51	117
380	48.500	1950	80	150	375	215	365	574	794	130	350	180	121	154	10	M18	1,93	163
430	71.800	1800	100	180	425	250	415	601	871	130	400	190	124	161	10	M20	3,7	230
480	96.700	1600	115	210	475	290	465	621	941	130	450	200	131	171	10	M20	8,75	311
540	145.700	1350	140	220	535	310	525	727	1067	160	500	228	155	195	14	M24	12,71	408
590	186.900	1250	150	260	585	365	575	727	1117	160	550	228	152	195	14	M24	18,86	534
640	233.150	1100	155	290	635	405	625	792	1232	160	600	258	180	222	14	M30	26,05	725
690	278.800	1000	165	310	685	435	675	817	1287	180	650	258	174	222	14	M30	38,99	857
750	378.900	950	190	340	750	470	734	966	1426	240	700	298	205	262	14	M30	54,22	1104
850	556.300	890	205	400	850	560	834	1106	1606	300	800	338	235	298	14	M30	127,42	1691
950	766.600	800	225	470	950	660	934	1182	1712	370	900	338	218	297	14	M36	184,58	2358
1050	924.000	700	250	525	1050	730	1034	1328	1898	430	1000	375	250	328	14	M36	385,83	3140
1250	1.417.600	600	300	600	1250	840	1234	1507	2157	550	1200	400	265	346	16	M36	684,94	4589

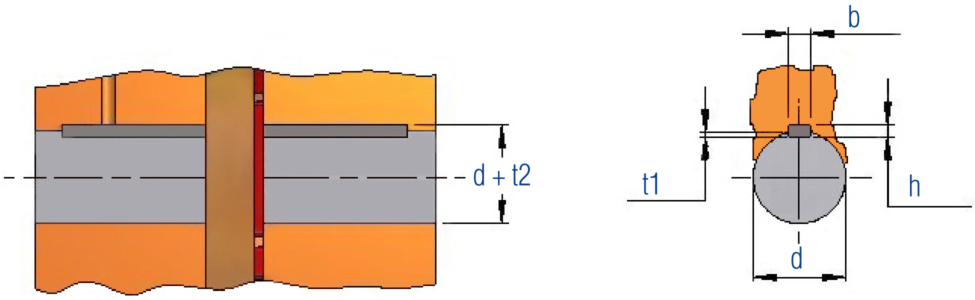
Dimensional HDFD



HDFD																
Size	Max moment (Nm)	Max rotation (rpm)	d min	d max	D	D1	L3*	L	L1	L2	L4*	S	S1	Screw	J (kgm²)*	Weight (w/ min. shaft dim.)
220	9.900	6000	25	90	220	130	274	100	64	83,5	30	8	36	M12	0,16	31
270	13.700	2600	30	95	265	135	355	130	82	107	30	10	55	M18	0,38	55
330	28.500	2100	45	125	325	180	424	160	103	135+	30	10	64	M18	1,31	102
380	48.500	1950	80	150	375	215	464	180	121	154	30	10	64	M18	1,68	142
430	71.800	1800	100	180	425	250	491	190	124	161	30	10	71	M20	3,22	200
480	96.700	1600	115	210	475	290	511	200	131	171	30	10	71	M20	7,61	270
540	145.700	1350	140	220	535	310	583	228	155	195	30	14	83	M24	11,05	355
590	186.900	1250	150	260	585	365	583	228	152	195	30	14	83	M24	16,4	464
640	233.150	1100	155	290	635	405	648	258	180	222	30	14	88	M30	22,65	630
690	278.800	1000	165	310	685	435	653	258	174	222	30	14	93	M30	33,9	745
750	378.900	950	190	340	750	470	754	298	205	262	42	14	102	M30	47,15	960
850	556.300	890	205	400	850	560	834	338	235	298	42	14	102	M30	110,8	1470
950	766.600	800	225	470	950	660	840	338	218	297	42	14	108	M36	160,5	2050
1050	924.000	700	250	525	1050	730	926	375	250	328	42	14	120	M36	335,5	2730
1250	1.417.600	600	300	600	1250	840	983	400	265	346	42	16	125	M36	595,6	3990

L3* considers L4* = 30mm and 42mm. For different L4*, L2* should be corrected.
J* and Weight* do not include the brake disc.

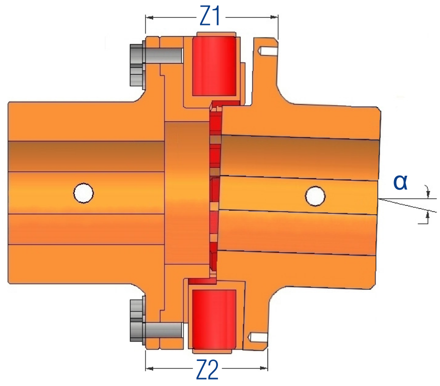
The HDF couplings are set on the shaft by a feather key in accordance with the norm DIN6885 part 1.



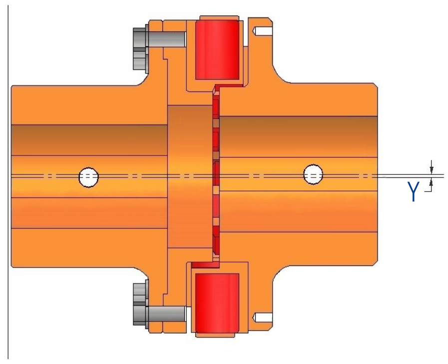
Feather key - DIN 6885/1					
Diameter d		Width b(*)	Height h	Keyway depth on the shaft t1	Keyway depth on the hub $d + t_2$
Above (mm)	to (mm)	(mm)	(mm)	(mm)	(mm)
8	10	3	3	1,8	d+ 1,4
10	12	4	4	2,5	d+ 1,8
12	17	5	5	3	d+ 2,3
17	22	6	6	3,5	d+ 2,8
22	30	8	7	4	d+ 3,3
30	38	10	8	5	d+ 3,3
38	44	12	8	5	d+ 3,3
44	50	14	9	5,5	d+ 3,8
50	58	16	10	6	d+ 4,3
58	65	18	11	7	d+ 4,4
65	75	20	12	7,5	d+ 4,9
75	85	22	14	9	d+ 5,4
85	95	25	14	9	d+ 5,4
95	110	28	16	10	d+ 6,4
110	130	32	18	11	d+ 7,4
130	150	36	20	12	d+ 8,4
150	170	40	22	13	d+ 9,4
170	200	45	25	15	d+10,4
200	230	50	28	17	d+11,4
230	260	56	32	20	d+12,4
260	290	63	32	20	d+12,4
290	330	70	36	22	d+14,4
330	380	80	40	25	d+15,4
380	440	90	45	28	d+17,4
440	500	100	50	31	d+19,4

* The tolerance zone for the width “b” of the hub keyway is in accordance with the norms ISO JS9 or ISO P9 for severe operation conditions. (Eg. Loaded reversion).

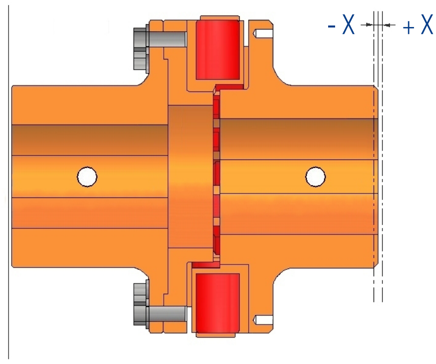
Admissible Misalignments



Angular



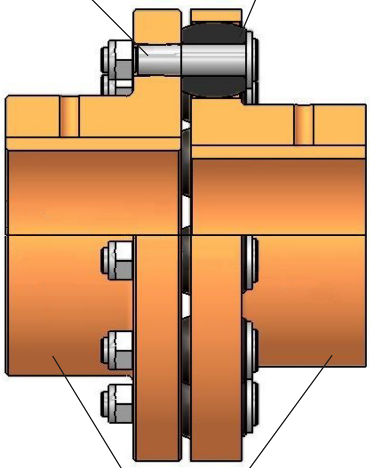
Radial



Axial

Admissible Misalignments for HDF Coupling															
Misalignment	220	270	330	380	430	480	540	590	640	690	750	850	950	1050	1250
Axial ± x (mm)	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Radial y (mm)	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Angular α (°)	0,5	0,5	0,5	0,4	0,4	0,35	0,35	0,3	0,3	0,3	0,3	0,25	0,23	0,25	0,25
ΔZ = Z1-Z2 (mm)	2	2	2,5	2,5	2,75	2,75	3	3	3	3,25	3,5	3,5	3,5	4	5

HDF Maximum Torsion Angle																
Size		220	270	330	380	430	480	540	590	640	690	750	850	950	1050	1250
δ	1/3 Mmax	1,2	1,55	0,87	0,96	0,96	0,83	0,88	0,78	0,71	0,56	0,51	0,43	0,3	0,5	0,4
(°)	Mmax	2,1	2,54	1,75	2,08	2,08	1,8	1,93	1,72	1,55	1,25	1,17	0,99	0,8	1,1	1



Composed of hubs and ductile iron and flexible elements which make them torsionally elastic, the Flexible Couplings Henflex HXP may have a wide range of applications where reliable torque transmission is required. Due to a careful selection of materials, it can be used on equipments with both high and low rotation.
The flexible elements are assembled axially, and they allow operation with radial, axial and angular misalignments. Besides, it absorbs shocks and vibrations from both drive and driven machines.

Its pins are over dimensioned in order to withstand many times the shear load descendant from the maximum allowed shock, which grants reliability and long life spam to these components.

Due to its constructive form, these couplings may be applied on both rotation directions and be submitted to rotation reversions without any harm to its operational conditions.

Besides requiring low maintenance, these couplings do not require lubrication and therefore, its environmental impact is null.

The Henflex HXP line is available in many sizes and covers operating torques ranging from 200 to 1.300.000 Nm and shafts of up to Ø600 mm.
This catalog presents only the basic constructive form of this coupling. For special applications, please consult our Engineering Department.

Coupling Size Selection

First of all, define the operational torque given by the equation bellow

$T_0 = \frac{C \times P}{n_m}$, Where:

T_0 = System operational torque [Nm];
P = Input power [kW or HP];
n_m = Rotation speed [rpm];
C:
C = 9550 for power in kW;
C = 7030 for power in HP.
From the operational torque, the coupling's nominal torque is obtained (T_{na}), which is given by:

$T_{na} \geq T_0 \times f_1$

Where:
T_{na} = Coupling nominal torque;
f_1 = Service factor (see table on page 16).

Obs: These couplings were dimensioned to withstand start up and braking at a maximum torque of up to three times the nominal torque of the coupling. These operations can be repeated 25 times per hour. However, should the coupling be submitted to loads involving shocks, the following equation must be considered:

$T = 3 \times T_{na} \geq T_s$

Where:
T = Maximum coupling torque;
T_s = Maximum impact torque of the system.

The service factor is a number obtained empirically that takes into account the operating regimes of the driving and driven machines.
The table bellow indicates the service factor considering the driven machine regimen and the drive type. In order to simplify the service conditions they were divided into three groups:
1 -Service condition with uniform load;
2 -With medium shocks;
3 -With strong shocks;

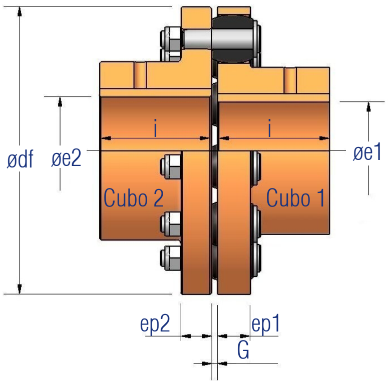
Application Conditions

The selection methods presented above are only valid if the environmental temperature where the coupling is applied ranges between -30ºC and 80ºC, with assembling and alignment as shown on pages 19 and 20, with no more than 25 start ups per hour.
For tougher applications or if you have any questions, please contact our engineering department.
It's also important to consider the shaft dimensions of the drive and driven machines as well as the admissible rotation speed of the couplings.

Service Factor f_1 for Daily Operation up to 24 hours				
Load type*		Actuation		
		Electric Motor	Motor Combustion with 4 a 6 Cylinders	Motor Combustion with 1 a 3 Cylinders
Uniform load	- Fans P/n=0,1; - Centrifugal pumps (low viscosity); - Screw pumps	1.0	1.25	1.75
Medium shocks	- Blowers and fans P/n>0,1; - Belt conveyors and chain conveyors; - Bucket elevators; - Hoisting gears; - Agitators ,Centrifuges, Mixers; - Concrete mixers; - Washing machines; - Wood working machines; - Plastic calenders, extruders and mixers; - Metal working machines - Metal planing machines; - Marine propeller; - Kilns.	1.25	1.5	2.0
Strong shocks	- Generators and transformers; - Piston pumps; - Mills; - Breakers; - Drums and rotary mills; - Pulp and paper processing machines; - Cranes; - Bucket wheel reclaimer; - Presses, hammers and scissors - Metal rolling and extruders; - Rubber mixers and extruders; - Elevators	1.75	2.0	2.5

(*) For other equipments, please consult our Engineering Department.

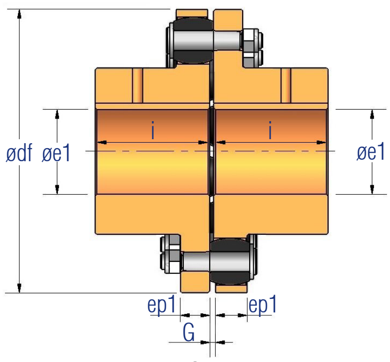
Dimensional Table – Sizes 4 to 14



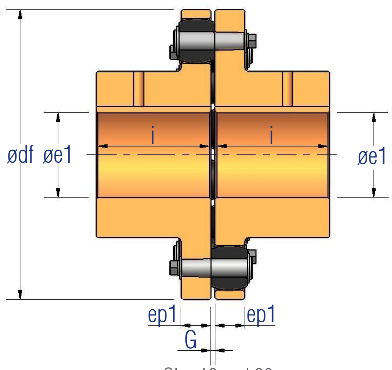
Size	Nominal Torque Tna (Nm)	Admissible Rotation [rpm]	Shaft Tip Diameters (mm)			General Dimensions (mm)					Weight (kg)		Momento of Inertia of the Hubs GD² (kgm²)	
			From	To										
			$e_{1/2}$	e_1	e_2	df	i	ep_1	ep_2	G	1	2	1	2
4	200	5.000	-	32	38	102	45	13	12	2 ~ 4	1,00	1,00	0,003	0,004
5	350	5.000	-	40	48	127	50	16	15	2 ~ 4	1,50	2,00	0,010	0,013
5,5	500	4.900	-	45	55	142	55	16	15	2 ~ 4	2,00	2,50	0,016	0,022
6	750	4.300	-	50	60	160	60	20	18	2 ~ 5	3,00	5,00	0,034	0,045
7	950	3.800	-	60	70	180	70	20	18	2 ~ 5	4,50	5,00	0,056	0,072
8	1.300	3.400	-	70	80	202	80	20	18	2 ~ 5	7,50	7,50	0,109	0,128
9	2.200	3.000	-	80	90	230	90	26	24	2 ~ 5	8,50	11,00	0,176	0,254
10	2.750	2.700	38	90	100	254	100	26	24	2 ~ 5	12,50	15,00	0,301	0,412
11	4.300	2.400	48	100	110	283	110	32	30	3 ~ 6	17,00	21,00	0,520	0,736
13	5.500	2.100	55	110	120	325	125	32	30	3 ~ 6	24,50	29,00	0,992	1,294
14	7.800	1.900	65	120	130	358	140	42	42	3 ~ 6	34,00	43,50	1,688	2,472

* To calculate "J", divide GD2 by 4.
The weight of the hubs and the moment of inertia were calculated considering the average of the minimum and maximum possible shaft bore dimensions.

Dimensional Table – Sizes 16, 18 and 20



Size 16

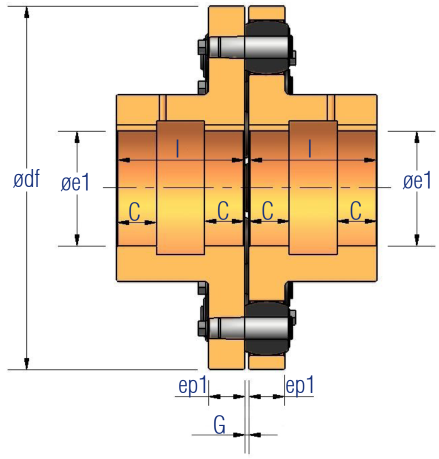


Size 18 and 20

Size	Nominal Torque Tna (Nm)	Admissible Rotation [rpm]	Shaft Tip Diameters (mm)		General Dimensions (mm)				Weight (kg)	Momento of Inertia of the Hubs GD² (kgm²)
			From	To						
			e_1	e_1	df	i	ep_1	G	1	1
16	12.500	1.700	75	140	400	160	42	3 ~ 6	52	3,273
18	18.500	1.500	85	160	455	180	52	4 ~ 7	77,50	6,544
20	25.000	1.350	95	180	505	200	52	4 ~ 7	102	10,46

* To calculate "J", divide GD2 by 4.
The weight of the hubs and the moment of inertia were calculated considering the average of the minimum and maximum possible shaft bore dimensions.

Dimensional Table – Sizes 22 to 79

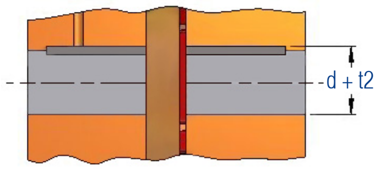


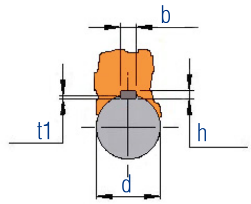
Size	Nominal Torque Tna (Nm)	Admissible Rotation [rpm]	Shaft Tip Diameters (mm)		General Dimensions (mm)					Weight (kg)	Momento of Inertia of the Hubs GD² (kgm²)
			From	To							
			e_1	e_1	df	i	ep_1	C	G	1	1
22	39.000	1.200	100 >140 >180	140 180 200	558	220	68	70	4 ~ 8	132 140 142	16,326 17,720 18,440
25	52.000	1.050	100 >140 >180	140 180 200	635	240	68	80	4 ~ 8	168 177 191	26,596 28,292 31,404
28	84.000	950	100 >160 >200	160 200 240	712	260	80	80	5 ~ 9	240 245 260	48,80 50,64 54,80
31,5	110.000	850	125 >180 >220	180 220 260	800	290	80	90	5 ~ 9	322 328 353	81,80 84,68 91,84
36	150.000	750	140 >220 >260	220 260 290	905	320	90	100	5 ~ 10	440 474 496	144,44 153,28 164,76
40	195.000	680	150 >240 >280	240 280 320	1010	350	90	110	5 ~ 10	582 625 657	235,52 248,68 264,20
44	270.000	600	160 >200 >250 >300	200 250 300 350	1118	380	100	120	6 ~ 11	763 775 842 882	395,4 402,4 424,8 449,2
49	345.000	550	180 >230 >280 >330	230 280 330 380	1248	420	100	130	6 ~ 11	983 1.000 1.077 1.141	601,6 613,2 645,2 684,0
55	530.000	490	200 >260 >320 >380	260 320 380 440	1402	480	120	145	6 ~ 12	1.469 1.494 1.609 1.692	1.126,4 1.149,6 1.213,2 1.289,6
63	750.000	430	260 >320 >380 >440	320 380 440 480	1604	540	120	165	6 ~ 12	2.068 2.109 2.261 2.328	2.030,8 2.079,2 2.175,2 2.254,8
71	975.000	380	320 >380 >440 >500	380 440 500 540	1805	600	140	185	8 ~ 16	3.063 3.111 3.333 3.413	3.821,2 3.900,8 4.112 4.240
79	1.300.000	340	380 >440 >500 >560	440 500 560 600	2006	660	140	200	8 ~ 16	3.970 4.030 4.300 4.370	5.840 5.976 6.324 6.468

* To calculate “J”, divide GD2 by 4.
The weight of the hubs and the moment of inertia were calculated considering the average of the minimum and maximum possible shaft bore dimensions.

Feather Key and Keyway Dimensions

The HXP couplings are set on the shaft by a feather key in accordance with the norm DIN6885 part 1





Feather Key – DIN 6885/1					
Diameter d		Width b(*)	Height h	Keyway Depth on the Shaft t1	Keyway Depth on the Hub $d + t_2$
Above of (mm)	until (mm)	(mm)	(mm)	(mm)	(mm)
8	10	3	3	1,8	d+ 1,4
10	12	4	4	2,5	d+ 1,8
12	17	5	5	3	d+ 2,3
17	22	6	6	3,5	d+ 2,8
22	30	8	7	4	d+ 3,3
30	38	10	8	5	d+ 3,3
38	44	12	8	5	d+ 3,3
44	50	14	9	5,5	d+ 3,8
50	58	16	10	6	d+ 4,3
58	65	18	11	7	d+ 4,4
65	75	20	12	7,5	d+ 4,9
75	85	22	14	9	d+ 5,4
85	95	25	14	9	d+ 5,4
95	110	28	16	10	d+ 6,4
110	130	32	18	11	d+ 7,4
130	150	36	20	12	d+ 8,4
150	170	40	22	13	d+ 9,4
170	200	45	25	15	d+10,4
200	230	50	28	17	d+11,4
230	260	56	32	20	d+12,4
260	290	63	32	20	d+12,4
290	330	70	36	22	d+14,4
330	380	80	40	25	d+15,4
380	440	90	45	28	d+17,4
440	500	100	50	31	d+19,4

* The tolerance zone for the width "b" of the hub keyway is in accordance with the norms ISO JS9 or ISO P9 for severe operation conditions. (Eg. Loaded reversion)

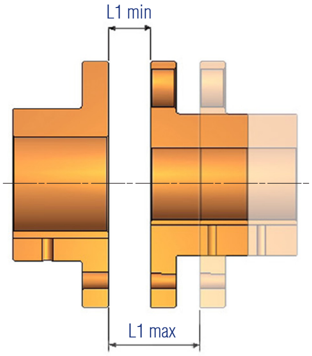
Material, Phisical Characteristics and Application

Type	Material	Hardness	Temperature range	Selection criteria	Field of application
Standard	Black Perbunan	80 Shore	From -30 °C Until + 80 °C		Application on drives within the mechanical engineering field.
Special	Black Perbunan	60 Shore*	From -30 °C Until + 80 °C	Change of the resonance speed by changing the dynamic torsional stiffness	
	Natural Black Rubber	80 Shore	From -50 °C Until + 50 °C	Change of temperature ranges. For applications in low temperature environments	
	Green Perbunan	80 Shore	From -30 °C Until + 80 °C	Electrical insulator	

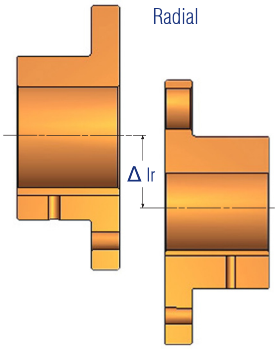
* Torque reductions must be considered

Admissible Misalignment

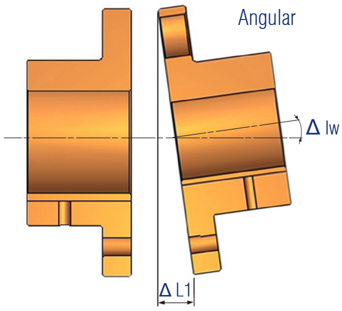
The misalignment of the components can affect the performance of the coupling due to vibrations, temperatures and noises, to name a few problems, and reduce the life spam of the flexible elements and driven machines. Both radial and axial misalignment of the shaft tips must be minimum in order to increase the life spam of elastic elements. The assembly must be done in accordance with the instructions on this catalog and obey the spacing and tolerances.



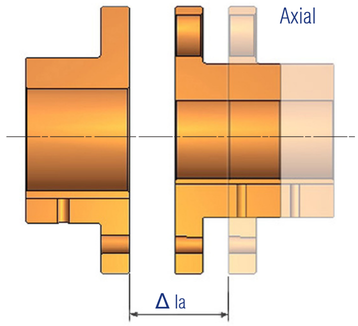
During the assembly, the coupled parts must be adjusted in accordance with the L1 dimension and their respective tolerances.



Radial misalignment Δ lr.



Angular misalignment or Δ lw, alternatively Δ L ,1 with the difference between the measured dimensions of adjustment.



Axial misalignment Δ la.
During operation, a 10 Hz axial misalignment is allowed.

Size	Spacing adjustment during the assembly		Shaft spacing (round numbers) for radial, angular and axial allowed misalignments during assembly							
d_a	L1 min.	L1 máx.	Speed 500 min-1		Speed 1000 min-1		Speed 1500 min-1		Speed 3000 min-1	
in	mm		mm*	Degree*	mm*	Degree*	mm*	Degree*	mm*	Degree*
4	2	4	0,35	0,20	0,25	0,14	0,20	0,11	0,15	0,08
5	2	4	0,40	0,18	0,30	1,13	0,25	0,11	0,15	0,07
5,5	2	4	0,45	0,18	0,30	1,12	0,25	0,10	0,20	0,07
6	2	5	0,45	0,17	0,35	1,12	0,25	0,10	0,20	0,07
7	2	5	0,50	0,16	0,35	0,11	0,30	0,09	0,20	0,06
8	2	5	0,50	0,15	0,40	0,11	0,30	0,09	0,20	0,06
9	2	5	0,60	0,15	0,40	0,10	0,35	0,09	0,25	0,06
10	2	5	0,65	0,14	0,45	0,10	0,35	0,08	0,25	0,06
11	3	6	0,70	0,14	0,50	0,10	0,40	0,08	0,30	0,06
13	3	6	0,75	0,13	0,55	0,09	0,45	0,08	0,30	0,06
14	3	6	0,80	0,13	0,60	0,09	0,50	0,08	0,35	0,05
16	3	6	0,90	0,13	0,65	0,09	0,50	0,07		
18	4	7	1,00	0,12	0,70	0,09	0,55	0,07		
20	4	7	1,10	0,12	0,75	0,09	0,60	0,07		
22	4	8	1,20	0,12	0,85	0,08	0,70	0,07		
25	4	8	1,30	0,12	0,90	0,08	0,75	0,07		
28	5	9	1,45	0,12	1,00	0,08	0,85	0,07		
31,5	5	9	1,60	0,12	1,10	0,08				
36	5	10	1,80	0,11	1,30	0,08				
40	5	10	2,00	0,11	1,40	0,08				
44	6	11	2,20	0,11	1,50	0,08				
49	6	11	2,40	0,11						
55	6	12	2,70	0,11						
63	6	12	3,00	0,11						
71	8	16	3,40	0,11						
79	8	16	3,80	0,11						

mm* = Δlr allowed, ΔL1allowed, Δla allowed,
Degree* = Δw perm

Radial, angular and axial allowed misalignments can be calculated with the following formula:

$$\Delta lr \text{ allowed} = \Delta L1 \text{ allowed} = \Delta la \text{ allowed} = \left(0,1 + \frac{da}{39,37}\right) x \frac{40}{\sqrt{n}}$$

Where:

n = Coupling rotation speed (min-1)

da = Coupling size (in)

Δlr allowed = Allowed radial misalignment (mm)

ΔL1allowed = Allowed angular misalignment (mm)

Δla allowed = Allowed angular misalignment (mm)

Recommended Torque for Bolts and Nuts

Bolt (mm)	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M36
Torque (kgf.m)	1,5	3	5	9	14	20	30	35	45	60	80	110	265

Bolts Class 10.9

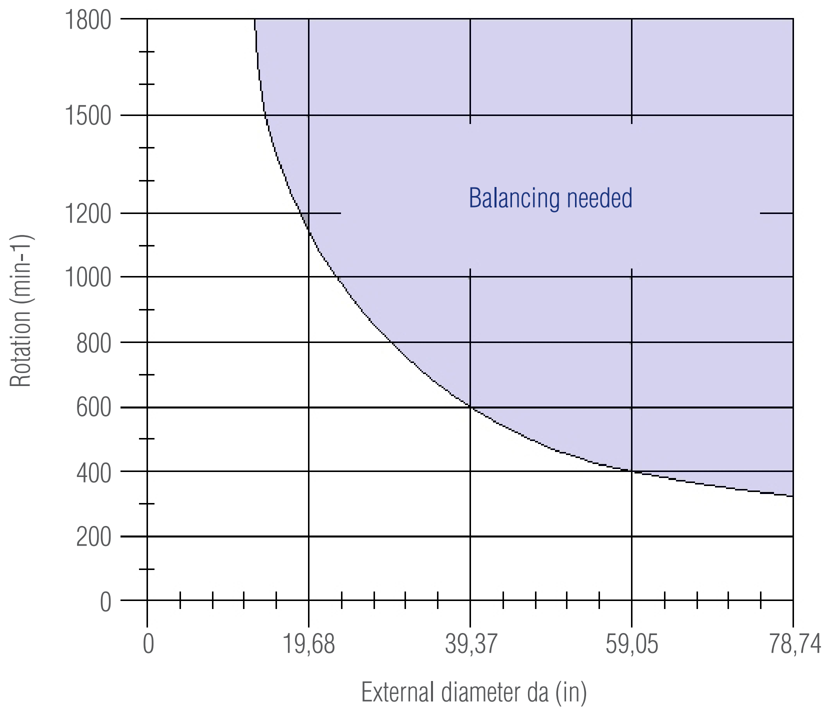
Balancing

The hubs balancing of Henflex HXP couplings are in accordance with the NBR 8008 norm.

For n = 1500 RPM or peripheral speed = 30m/s, do the balancing on one plan with G16 quality.

For n > 1500 RPM or peripheral speed > 30m/s, do the balancing on both plans with G6,3 quality.

The hubs are supplied balanced whenever the operational rotation informed is within the balancing region on the graph below:



Attention: Always check the admissible rotation on the dimensional table.

HDF / HXP-0714-ENG

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