HTB/HTB-GS Flexible Coupling

Brochure

RENOLD | Couplings

Contents

Innovation Everyday

Renold have been driving industry forward through innovation since 1879. Renold Couplings drives industry the world over, from marine, cranes and hoists to manufacture, mass transportation and the pulp and paper industry. Our couplings connect machines to machines through stock solutions and bespoke-crafted connections, all manufactured in our high-tech engineering factories.

Engineering capability

A team of in-house design engineers work to continuously improve the existing product range, introduce new products and deliver innovative new solutions to our customers challenges.

British manufacturer

Since 1946 Renold Couplings have manufactured a full range of couplings and clutches.

Based in Cardiff, UK, we control the full design and manufacture process, bringing class leading quality and complete customer peace of mind.

Worldwide support

With manufacturing facilities in 4 continents and support offices in over 30 countries Renold Couplings can offer service that understands the requirements and challenges of your particular market.

Reliability

Renold rubber in compression couplings are designed and made to the highest of standards delivering a premium product with premium performance. Where hassle free operation, peace of mind and longevity of service count then Renold's rubber in compression couplings are the answer.

HTB Flexible Coupling

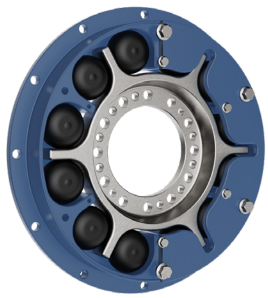
High temperature blind assembly, coupling designed for bell housing applications.

Coupling capacity

- Up to 120kNm torque
- Maximum 3,730 rpm
- Up to 220mm bore

Applications

- Marine Propulsion
- Generator Sets
- Pump Sets
- Compressor
- Rail Traction
- Off highway vehicles



Range options

- ABS, DNV, Lloyds, BV Type Approved
- SAE Flywheel attachment
- Hub or bolted inner connection
- Hub connections featuring bore and key, pilot bored, taper bore, oil injection and splined options
- Tailored torsional stiffness

Construction details

All metal construction including the following options:

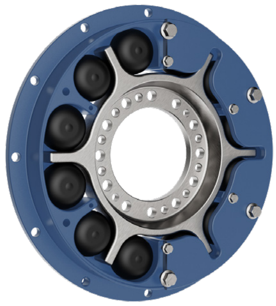
- SG Iron body
- Steel body
- Connection and bore options
- Standard, 3.1 and 3.2 materials available
- Optional painting
- Various rubber grades

Features and benefits

- Unique blind assembly
- High temperature capability (up to 200C)
- Severe shock load protection
- Intrinsically fail safe
- Maintenance free
- Noise attenuation
- Allows easy assembly for applications in bell housings
- Avoiding failure of the drive line under short circuit and other transient conditions
- Fit and forget! – No lubrication or adjustment required
- Giving quiet running conditions in sensitive applications by the elimination of metal to metal contact
- Interchangeable metal and rubber components for clockwise and anti-clockwise operation
- Control of resonant torsional vibrations through changeable block stiffness

HTB Components

The HTB coupling transfers torque to the driven application via the rubber blocks situated between the blades of the inner and outer member. The outer member features SAE compatible holes on the flange to match directly to standard engine flywheels. The driven application can be attached directly to the inner member using the pre-drilled hole pattern, or can be attached via the driven hub using, for example, a standard bore and keyway interface.

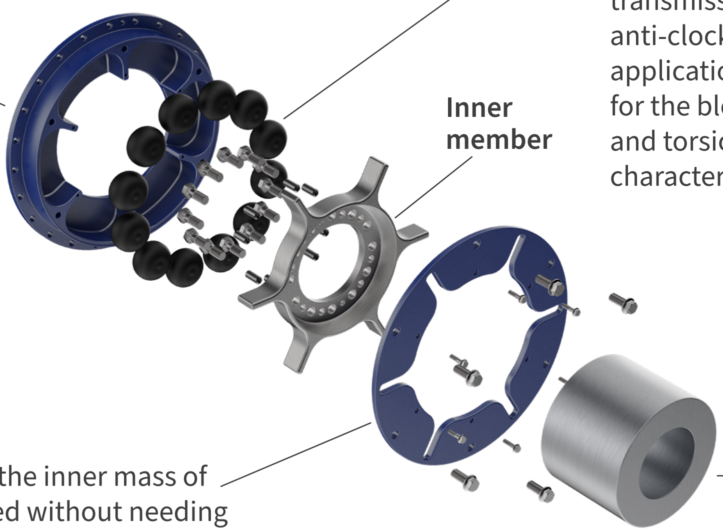


Failsafe design

The intrinsically failsafe design ensures continuous operation of the driveline in the unlikely event of rubber damage.

Rubber Blocks

The rubber blocks are symmetrical in this design, offering torque transmission in both clockwise and anti-clockwise directions for reversible applications. The grade of rubber used for the blocks determines the stiffness and torsional vibration damping characteristics of the coupling.



Profiled Cover

The profiled cover allows the inner mass of the coupling to be removed without needing to remove the cover and the rubber blocks. The cover holds the blocks in position while the inner member slides out through the profiled aperture, allowing faster and simpler disconnection of the driven and driving equipment.

HTB Typical Applications

Main propulsion

Coupling fitted between engine and gearbox.

Main propulsion

Coupling fitted between diesel engine and gearbox.

Diesel generator sets

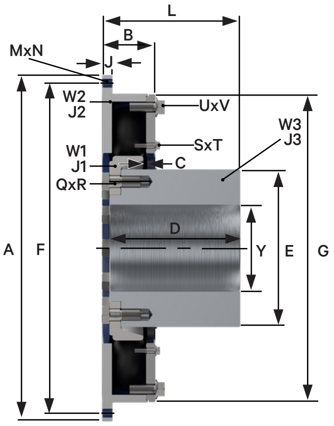
Couplings fitted between diesel engine and alternator

Rail traction

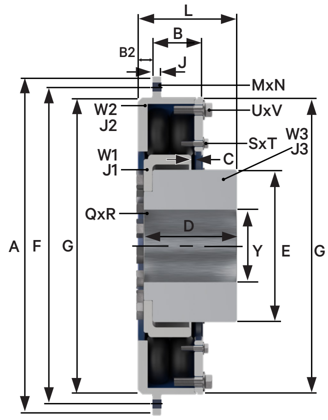
Couplings fitted between diesel engines and transmission gear.

HTB Standard SAE Flywheel to Shaft

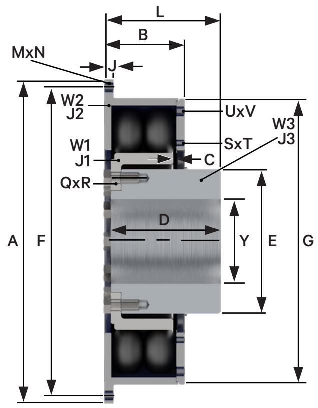
HTB1200 - HTB10000



HTB4500



HTB12000 - HTB40000



Dimensions, weight, inertia and alignment

Coupling size		1200		3000		4500		6000		10000	12000		20000	30000	40000
		SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	SAE24	
Dimensions (mm)	A	352.4	466.7	466.7	571.5	466.7	571.5	571.5	673.1	673.1	571.5	673.1	673.1	733.42	860.0
	B	50	50	67	67	69.5	69.5	84	84	103	141	141	173	213	215
	B_2	–	–	–	–	20.0	20.0	–	–	–	–	–	–	–	–
	C	3	3	3	3	3	3	4	4	4	4	4	4	7	7
	D (standard)	100	100	112	112	128	128	139	139	166	194	194	236	278	276
	D (DIN 6281)	100	85.8	105	105	105	105	–	–	–	–	–	–	–	–
	E	156	156	210	210	210	210	256	256	308	256	256	308	346	416
	F	333.4	438.2	438.2	542.9	438.2	542.9	542.9	641.4	641.4	542.9	641.4	641.4	692	820
	G	304	304	409	409	409	409	505	505	600	505	505	600	646	778
	J	10	10	12	12	12	12	16	16	20	16	16	20	20	22
	L (standard)	106.6	106.6	120	120	136	136	150	150	180	205	205	250	300	300
	M	8	8	8	6	8	6	6	12	12	6	12	12	12	32
	N	10.5	13.5	13.5	17	13.5	17	17	17	17	17	17	17	22	21
	L (DIN 6281)	106.6	92.4	92.4	–	92.4	–	–	–	–	–	–	–	–	–
	Q	12	12	12	12	16	16	12	12	12	12	12	12	16	16
	R	M12	M12	M16	M16	M16	M16	M20	M20	M24	M20	M20	M24	M24	M24
	S	6	6	6	6	6	6	6	6	6	6	6	6	–	–
	T	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10	M10	M10	–	–
	U	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	V	M12	M12	M14	M14	M14	M14	M16	M16	M20	M16	M16	M20	M24	M24
	Y (max)	85	85	115	115	115	115	150	150	170	150	150	170	215	220
	Y (min)	40	40	50	50	50	50	60	60	60	60	60	60	90	110
	Z	16	16	20	20	0	0	29	29	36	29	29	36	–	–
Rubber driving elements	Per cavity	1	1	1	1	2	2	1	1	1	2	2	2	2	2
	Per coupling	12	12	12	12	24	24	12	12	12	24	24	24	24	24
Maximum Speed [rpm]		3730	2820	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1850	1500
Weight (kg)	W1	3	3	7	7	10.6	10.6	16	16	24.4	41.7	41.7	56	65.3	98.3
	W2	10	15.2	22.1	29.2	26.4	34.5	43.2	55.1	77.9	58.6	70.5	112.1	145.2	199.7
	W3 (standard)	12.1	12.2	22.9	22.9	22.9	22.9	42	42	46.7	65.1	65.1	114.5	185.2	262.6
	W3 (DIN 6281)	12.2	10.3	20.5	–	20.5	–	–	–	–	–	–	–	–	–
	Total (W1&W2)	13	18.2	29.2	36.2	37	45.1	59.2	71.1	102.3	100.3	–	168.1	210.5	298
Inertia (kg m²)	J1	0.03	0.03	0.09	0.09	0.15	0.15	0.26	0.26	0.64	0.98	0.98	1.92	3.07	5.97
	J2	0.19	0.42	0.75	0.93	0.88	0.92	2.26	3.35	5.39	2.79	3.95	6.63	12.21	23.68
	J3 (standard)	0.04	0.04	0.14	0.14	0.17	0.17	0.37	0.37	1	0.58	0.58	1.47	2.92	5.96
	J3 (DIN 6281)	0.03	0.04	0.12	–	0.12	–	–	–	–	–	–	–	–	–
Allowable misalignment radial (mm)	Align	0.25	0.25	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Max	1	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Axial (mm)	Align	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Max	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Conical (degree)		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

Technical Data

1.1 Torque capacity – diesel engine drives

The HTB Coupling is selected on the "Nominal Torque T_{KN}" without service factors for Diesel Drive applications.

The full torque capacity of the coupling for transient vibration whilst passing through major criticals on run up, is published as the maximum torque T_{Kmax}.

($T_{Kmax} = 3 \times T_{KN}$).

There is additional torque capacity built within the coupling for short circuit and shock torques, which is 3 x T_{Kmax}.

The published "Vibratory Torque T_{KW}", relates to the amplitude of the permissible torque fluctuation. The vibratory torque values shown in the technical data are at the frequency of 10Hz. The allowable vibratory torque at higher or lower frequencies fe = $T_{KW} \sqrt{\frac{10Hz}{fe}}$

The measure used for acceptability of the coupling under vibratory torque, is published as "Allowable dissipated heat at ambient temperature 30°C".

1.2 Transient torques

Prediction of transient torques in applications such as marine drives can be complex. Normal installations are well provided for by selecting couplings based on the "Nominal Torque TKn". Transients, such as start up and clutch manoeuvre, are usually within the "Maximum Torque TKmax" for the coupling.

Care needs to be taken in the design of couplings with shaft brakes, to ensure coupling torques are not increased by severe deceleration.

Sudden torque applications of propulsion devices such as thrusters or waterjets, need to be considered when designing the coupling connection.

2.0 Stiffness properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The HTB series is a non-bonded type operating with the Rubber-in-Compression principle.

2.1 Axial stiffness

When subject to axial misalignment, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torque.

The axial stiffness of the coupling is torque dependent, and variation is as shown in the technical data on pages 10 and 15.

2.2 Radial stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the technical data on pages 10 and 15.

2.3 Torsional stiffness

The torsional stiffness of the coupling is dependent upon applied torque and temperature as shown in the technical data on pages 10 and 15.

2.4 Prediction of the system torsional vibration characteristics

An adequate prediction of the system's torsional vibration characteristics, can be made by the following method:

2.4.1 Use the torsional stiffness, as shown in the technical data, which is based upon data measured at 30°C ambient temperature.

2.4.2 Repeat the calculation 2.4.1, but using the maximum temperature correction factor S_{t100} (S_{t200} for Si70 rubber), and dynamic magnifier correction factor, M_{100} (M_{200} for Si70 rubber), for the selected rubber. Use tables on pages 10 and 15. to adjust values for both torsional stiffness and dynamic magnifier.

ie. $C_{T100} = C_{Tdyn} \times S_{t100}$.

2.4.3 Review calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalogue, then the coupling is considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range, then actual temperature of the coupling will need to be calculated at this speed.

HTB Technical Data

Rubber grade	Temp max °C	S_t
Si70	200	$St_{200} = 0.48$
SM60	100	$St_{100} = 0.75$
SM70	100	$St_{100} = 0.63$
SM80	100	$St_{100} = 0.58$

Si70 is considered “standard”

Rubber grade	Dynamic magnifier at 30°C (M_{30})	Dynamic magnifier at 100°C (M_{100})
Si70	7.5	$M_{200} = 15.63$
SM60	8	10.7
SM70	6	9.5
SM80	4	6.9

Si70 is considered “standard”

2.5 Prediction of the actual coupling temperature and torsional stiffness

2.5.1 Use the torsional stiffness as published in the catalogue. This is based upon data measured at 30°C and the dynamic magnifier at 30°C. (M_{30})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the “Allowable Heat Dissipation” (P_{KW}). The coupling temperature rise

$$°C = Temp_{coup} = \left(\frac{Pk}{Pkw}\right) \times 70 \text{ (170 for Si70 rubber)}$$

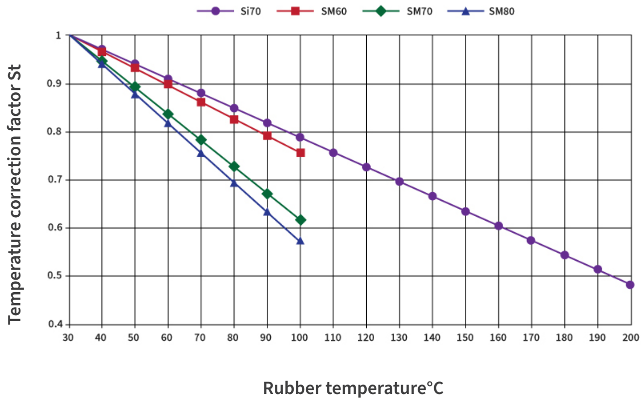
The coupling temperature = ϑ

$\vartheta = Temp_{coup} +$ Ambient Temp.

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 100°C (200°C for Si70 rubber), then use St_{100} (St_{200} for Si70 rubber). Calculate the dynamic magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier.

2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.7 Temperature correction factor



2.7 Dynamic magnifier correction factor

The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \qquad \psi_T = \psi_{30} \times S_t$$

Rubber grade	Dynamic magnifier (M_{30})	Relative damping ψ_{30}
Si70	7.5	0.83
SM60	8	0.78
SM70	6	1.05
SM80	4	1.57

Si70 is considered “standard”

HTB Technical Data

Coupling size		1200		3000		4500		6000		10000	12000		20000	30000	40000
		SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	SAE24	
Nominal torque T_{KN} (kNm)		1.2	1.2	3	3	4.5	4.5	6	6	10	12	12	20	30	40
Maximum torque T_{Kmax} (kNm)		3.6	3.6	9	9	13.5	13.5	18	18	30	36	36	60	90	120
Vibratory torque T_{KW} (kNm)		0.4	0.4	1	1	1.5	1.5	2	2	3.3	4	4	6.6	10	13.3
Dynamic Torsional Stiffness CTdyn (MNm/rad)															
10% nominal torque T_{KN}	Si70	0.003	0.003	0.008	0.008	0.012	0.012	0.015	0.015	0.027	0.030	0.030	0.054	0.080	0.117
	NM45	0.005	0.005	0.013	0.013	0.019	0.019	0.024	0.024	0.043	0.048	0.048	0.086	0.129	0.187
	SM50	0.006	0.006	0.015	0.015	0.022	0.022	0.028	0.028	0.050	0.056	0.056	0.100	0.150	0.218
	SM60	0.007	0.007	0.018	0.018	0.027	0.027	0.034	0.034	0.061	0.068	0.068	0.122	0.183	0.265
	SM70	0.012	0.012	0.030	0.030	0.044	0.044	0.056	0.056	0.100	0.112	0.112	0.200	0.301	0.437
	SM80	0.018	0.018	0.045	0.045	0.067	0.067	0.085	0.085	0.152	0.170	0.170	0.304	0.456	0.663
25% nominal torque T_{KN}	Si70	0.008	0.008	0.021	0.021	0.032	0.032	0.040	0.040	0.072	0.080	0.080	0.143	0.184	0.310
	NM45	0.012	0.012	0.029	0.029	0.043	0.043	0.055	0.055	0.098	0.110	0.110	0.197	0.295	0.429
	SM50	0.012	0.012	0.030	0.030	0.045	0.045	0.057	0.057	0.102	0.114	0.114	0.204	0.306	0.445
	SM60	0.013	0.013	0.033	0.033	0.049	0.049	0.062	0.062	0.111	0.124	0.124	0.222	0.333	0.484
	SM70	0.020	0.020	0.050	0.050	0.075	0.075	0.095	0.095	0.170	0.190	0.190	0.340	0.510	0.741
	SM80	0.025	0.025	0.064	0.064	0.096	0.096	0.121	0.121	0.217	0.242	0.242	0.433	0.650	0.944
50% nominal torque T_{KN}	Si70	0.022	0.022	0.056	0.056	0.086	0.086	0.105	0.105	0.188	0.210	0.210	0.376	0.565	0.819
	NM45	0.024	0.024	0.060	0.060	0.089	0.089	0.113	0.113	0.202	0.226	0.226	0.404	0.606	0.880
	SM50	0.025	0.025	0.064	0.064	0.095	0.095	0.120	0.120	0.215	0.240	0.240	0.430	0.644	0.936
	SM60	0.028	0.028	0.070	0.070	0.105	0.105	0.133	0.133	0.238	0.266	0.266	0.476	0.714	1.037
	SM70	0.038	0.038	0.096	0.096	0.144	0.144	0.182	0.182	0.326	0.364	0.364	0.652	0.977	1.420
	SM80	0.051	0.051	0.130	0.130	0.194	0.194	0.245	0.245	0.439	0.490	0.490	0.877	1.315	1.911
75% nominal torque T_{KN}	Si70	0.043	0.043	0.109	0.109	0.162	0.162	0.205	0.205	0.367	0.410	0.410	0.734	1.096	1.597
	NM45	0.038	0.038	0.096	0.096	0.143	0.143	0.181	0.181	0.324	0.362	0.362	0.648	0.972	1.412
	SM50	0.042	0.042	0.106	0.106	0.158	0.158	0.200	0.200	0.358	0.400	0.400	0.716	1.074	1.560
	SM60	0.050	0.050	0.127	0.127	0.190	0.190	0.240	0.240	0.430	0.480	0.480	0.859	1.288	1.872
	SM70	0.063	0.063	0.158	0.158	0.235	0.235	0.298	0.298	0.533	0.596	0.596	1.067	1.600	2.324
	SM80	0.095	0.095	0.239	0.239	0.356	0.356	0.451	0.451	0.807	0.902	0.902	1.615	2.421	3.518
100% nominal torque T_{KN}	Si70	0.074	0.074	0.178	0.178	0.265	0.265	0.335	0.335	0.600	0.670	0.670	1.200	1.790	2.609
	NM45	0.054	0.054	0.137	0.137	0.205	0.205	0.259	0.259	0.464	0.518	0.518	0.927	1.390	2.020
	SM50	0.063	0.063	0.159	0.159	0.237	0.237	0.300	0.300	0.537	0.600	0.600	1.074	1.610	2.340
	SM60	0.080	0.080	0.201	0.201	0.300	0.300	0.380	0.380	0.680	0.760	0.760	1.360	2.040	2.964
	SM70	0.093	0.093	0.234	0.234	0.349	0.349	0.442	0.442	0.791	0.884	0.884	1.582	2.373	3.448
	SM80	0.155	0.155	0.391	0.391	0.582	0.582	0.737	0.737	1.319	1.474	1.474	2.638	3.956	5.749
Allowable heat loading at 30°C ambient P_{KW} (W)	Si70	430	430	600	600	760	760	735	735	900	1150	1150	1425	1650	1800
	NM45	140	140	215	215	260	260	300	300	385	420	420	535	645	750
	SM50	140	140	215	215	260	260	300	300	385	420	420	535	645	750
	SM60	140	140	215	215	260	260	300	300	385	420	420	535	645	750
	SM70	145	145	230	230	280	280	320	320	410	450	450	575	700	810
	SM80	155	155	245	245	300	300	350	350	450	500	500	635	750	900
Dynamic magnifier (M)	Si70	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	NM45	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	SM50	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	SM60	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	SM70	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	SM80	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Maximum speed (RPM)		3730	2820	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1850	1500
Radial stiffness*															
No load (N/mm)	Si70	520	520	710	710	1050	1050	900	900	1040	1800	1800	2080	2255	2430
At TkN (N/mm)	Si70	1655	1655	2275	2275	3360	3360	2875	2875	3325	5740	5740	6640	7195	7750
Axial stiffness*															
No load (N/mm)	Si70	195	195	275	275	515	515	345	345	415	980	980	1150	1570	2650
At TkN (N/mm)	Si70	840	840	1180	1180	2210	2210	1490	1490	1790	4230	4230	4770	6782	8560

*Radial and axial stiffness values for other rubber grades are available on request

HTB-GS Flexible Coupling

The HTB-GS range of flexible couplings is a second generation coupling derived from Renold Hi-Tec Couplings' existing HTB range.

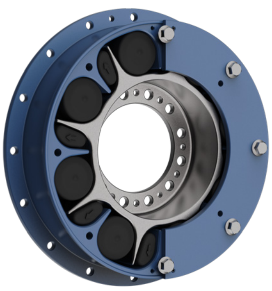
HTB-GS couplings have low weight and inertia yet retain the unrivalled quality and endurance features of the standard HTB.

Coupling capacity

- Up to 160kNm torque
- Maximum 3,730 rpm
- Up to 220mm bore

Applications

- Marine Propulsion
- Generator Sets
- Pump Sets
- Compressor sets
- Rail Traction
- Off highway vehicles



Range options

- ABS, DNV, Lloyds, BV Type Approved
- SAE Flywheel attachment
- Hub or bolted inner connection
- Hub connections featuring bore and key, pilot bored, taper bore, oil injection and splined options
- Tailored torsional stiffness

Construction details

All metal construction including the following options:

- SG Iron body
- Steel body
- Connection and bore options
- Standard, 3.1 and 3.2 materials available
- Optional painting
- Various rubber grades

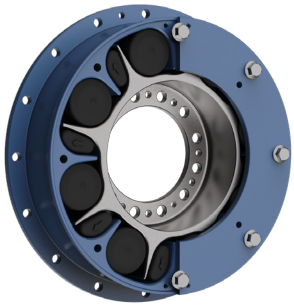
Features and benefits

- Unique blind assembly
- High temperature capability (up to 200°C)
- Severe shock load protection
- Intrinsically fail safe
- Maintenance free
- Allows easy assembly for applications in bell housing
- Control of resonant torsional vibrations through changeable block stiffness
- Uni-directional providing ultra compact and power dense solution
- Allows operation in bell housing where ambient temperatures can be high
- Avoid failure of the drive line under short circuit and other transient conditions
- Fit and forget! – No lubrication or adjustment required

Coupling rotation

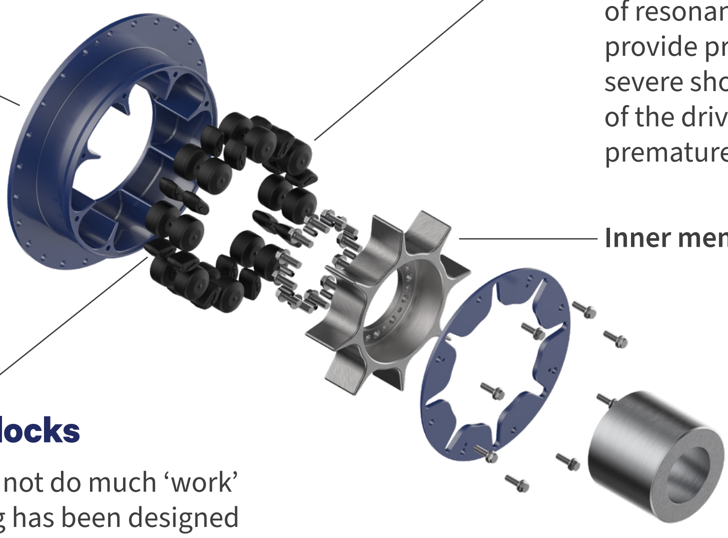
The HTB-GS coupling is unidirectional and designed to operate in either a clockwise or anti-clockwise direction. It is important, therefore, to establish which direction the coupling will operate at the specification stage.

The coupling shown here is designed to operate in a clockwise direction.



Failsafe design

The intrinsically failsafe design ensures continuous operation of the driveline in the unlikely event of rubber damage.



Driving rubber blocks

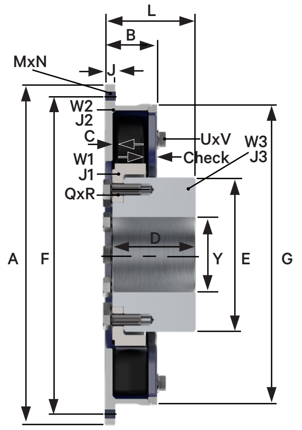
The lead blocks carry all the torque and are selected to provide optimum control of resonant torsional vibration. They also provide protection of the driveline from severe shock load. All this avoids failure of the driveline from short circuit or premature fatigue.

Trailing rubber blocks

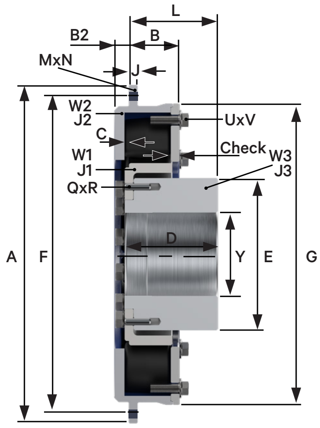
The trailing block does not do much 'work' as the HTB-GS coupling has been designed to operate in one direction. Therefore it is much smaller than the driving block which has enabled the overall size of the coupling to be reduced. The resulting decrease in weight and inertia decreases the bending moments on the drive shaft.

HTB-GS Standard SAE Flywheel to Shaft

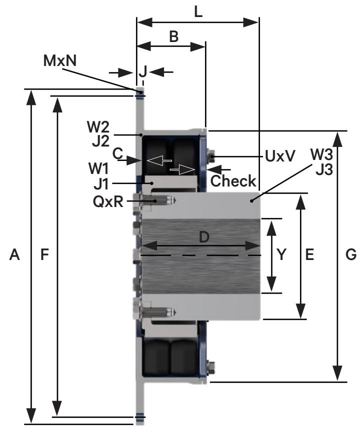
HTG-GS1600 - HTB-GS13300



HTB-GS6001



HTB-GS16000 - HTB-GS53300



Dimensions, weight, inertia and alignment

Coupling size		1600		4000		6001		8000		13300	16000		26600	40001	53300
		SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	SAE24	
Dimensions (mm)	A	352.4	466.7	466.7	571.5	466.7	571.5	571.5	673.1	673.1	571.5	673.1	673.1	733.4	860.0
	B	50	50	67	67	69.5	69.5	84	84	103	141	141	173	213	215
	B2	–	–	–	–	20	20	–	–	–	–	–	–	–	–
	C	4	4	4	4	4	4	5	5	4	5	5	4	7	7
	D	100	100	112	112	128	128	194	194	166	194	194	236	278	276
	E	156	156	210	210	210	210	256	256	308	256	256	308	346	416
	F	333.38	438.15	438.15	542.92	438.15	542.92	542.92	641.35	641.35	542.92	641.35	641.35	692.2	820.0
	G	309	309	416	416	416	416	509	509	595	509	509	595	650	783
	J	10	10	12	12	12	12	16	16	20	16	16	20	20	22
	L	106	106	120	120	116	116	205	205	180	205	205	252	300	300
	M	16	16	16	12	16	12	12	24	24	24	24	36	36	32
	N	Ø10.5	Ø13.5	Ø13.5	Ø17	Ø13.5	Ø17	Ø17	Ø17	Ø17	Ø17	Ø17	Ø17	Ø22	Ø21
	Q	12	12	12	12	16	16	12	12	16	12	12	12	24	16
	R	M12	M12	M16	M16	M16	M16	M20	M20	M24	M20	M20	M24	M24	M24
	U	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	V	M12	M12	M14	M14	M14	M14	M16	M16	M20	M16	M16	M20	M24	M24
	Y (max)	85	85	115	115	115	115	150	150	170	150	150	170	215	220
	Y (min)	40	40	50	50	50	50	60	60	60	60	60	60	90	110
	Check	13	13	16	16	16	16	20	20	22	20	20	22	25	25
Rubber driving elements	Per cavity	1	1	1	1	2	2	1	1	1	2	2	2	2	2
	Per coupling	8	8	8	8	16	16	8	8	8	16	16	16	16	16
Maximum Speed [rpm]		3730	3730	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1850	1500
Weight (kg)	W1	3.20	3.20	7.55	7.55	11.54	11.54	15.37	15.37	29.18	32.02	32.02	54.91	68.97	103.21
	W2	11.14	16.58	25.15	32.76	29.71	37.28	45.56	57.15	77.39	62.51	74.1	105.04	147.31	213.48
	W3	13.50	13.50	27.54	27.54	31.78	31.78	46.55	46.55	74.87	49.01	49.01	121.83	185.72	277.64
Inertia (kg m²)	J1	0.028	0.028	0.128	0.128	0.201	0.201	0.380	0.380	1.040	0.870	0.870	2.090	3.19	6.889
	J2	0.213	0.444	0.859	1.372	1.016	1.528	2.370	3.490	5.480	3.260	4.380	7.420	12.57	25.72
	J3	0.043	0.043	0.156	0.156	0.181	0.181	0.510	0.510	1.030	0.530	0.530	1.470	2.91	6.0
Allowable misalignment radial (mm)	Align	0.25	0.25	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Max	1	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Axial (mm)	Align	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Max	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Conical (degree)		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

HTB-GS Technical Data

See page 8 for definitions

Rubber grade	Temp $_{max}$°C	S_t
Si70	200	$St_{200} = 0.90$
NM45	100	$St_{100} = 0.90$
SM50	100	$St_{100} = 0.85$
SM60	100	$St_{100} = 0.75$
SM70	100	$St_{100} = 0.63$
SM80	100	$St_{100} = 0.58$

Si70 is considered “standard”

Rubber grade	Dynamic magnifier at 30°C (M_{30})	Dynamic magnifier at 100°C (M_{100})
Si70	7.5	$M_{200} = 8.3$
NM45	15	16.7
SM50	10	11.8
SM60	8	10.7
SM70	6	9.5
SM80	4	6.9

Si70 is considered “standard”

2.5 Prediction of the actual coupling temperature and torsional stiffness

2.5.1 Use the torsional stiffness as published in the catalogue, this is based upon data measured at 30°C and the dynamic magnifier at 30°C. (M_{30})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the “Allowable Heat Dissipation” (P_{KW}).

The coupling temperature rise

$$°C = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 70 \text{ (170 for Si70 rubber)}$$

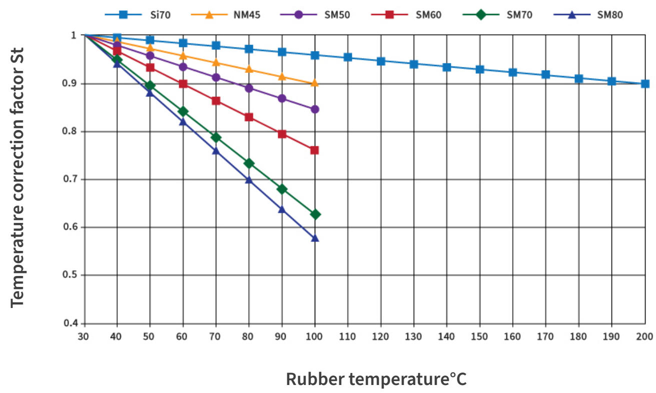
The coupling temperature = ϑ

$\vartheta = Temp_{coup}$ + Ambient Temp.

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 100°C (200°C for Si70 rubber), then use S_{t100}(S_{t200} for Si70 rubber). Calculate the dynamic Magnifier as per 2.7. Repeat the calculationwith the new value of coupling stiffness and dynamic magnifier.

2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature correction factor



2.7 Dynamic magnifier correction factor

The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{30}}{S_t} \qquad \psi_T = \psi_{30} \times S_t$$

Rubber grade	Dynamic magnifier (M_{30})	Relative damping ψ30
Si70	7.5	0.83
NM45	15	0.42
SM50	10	0.63
SM60	8	0.78
SM70	6	1.05
SM80	4	1.57

Si70 is considered “standard”

HTB-GS Technical Data

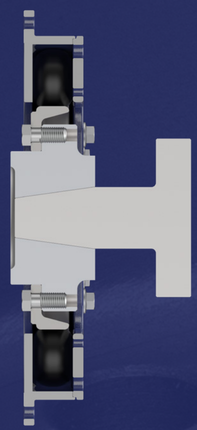
Coupling sized		1600		4000		6001		8000		13300	16000		26600	40001	53300
		SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	SAE24	
Nominal torque T_{KN} (kNm)		1.6	1.6	4	4	6	6	8	8	13.3	16	16	26.7	40	53.3
Maximum torque T_{Kmax} (kNm)		4.8	4.8	12	12	18	18	24	24	40	48	48	80	120	160
Vibratory torque T_{KW} (kNm)		0.5	0.5	1.3	1.3	2	2	2.7	2.7	4.4	5.3	5.3	8.9	13.3	17.8
HTB-GS Blocks Dynamic Torsional Stiffness CTdyn (MNm/rad)															
10% nominal torque	Si70	0.018	0.018	0.048	0.048	0.070	0.070	0.088	0.088	0.158	0.175	0.175	0.316	0.429	0.684
	NM45	0.028	0.028	0.077	0.077	0.112	0.112	0.140	0.140	0.253	0.281	0.281	0.505	0.682	1.094
	SM50	0.033	0.033	0.090	0.090	0.131	0.131	0.164	0.164	0.295	0.327	0.327	0.589	0.800	1.277
	SM60	0.040	0.040	0.109	0.109	0.159	0.159	0.199	0.199	0.358	0.397	0.397	0.715	0.970	1.550
	SM70	0.065	0.065	0.180	0.180	0.262	0.262	0.327	0.327	0.589	0.655	0.655	1.178	1.594	2.553
	SM80	0.099	0.099	0.273	0.273	0.397	0.397	0.497	0.497	0.894	0.994	0.994	1.789	2.422	3.875
25% nominal torque	Si70	0.019	0.019	0.049	0.049	0.076	0.076	0.094	0.094	0.169	0.189	0.189	0.337	0.458	0.729
	NM45	0.027	0.027	0.068	0.068	0.104	0.104	0.129	0.129	0.233	0.260	0.260	0.464	0.629	1.003
	SM50	0.028	0.028	0.070	0.070	0.108	0.108	0.133	0.133	0.242	0.269	0.269	0.481	0.648	1.039
	SM60	0.030	0.030	0.077	0.077	0.118	0.118	0.145	0.145	0.263	0.293	0.293	0.523	0.707	1.130
	SM70	0.046	0.046	0.117	0.117	0.180	0.180	0.222	0.222	0.403	0.449	0.449	0.801	1.082	1.732
	SM80	0.059	0.059	0.150	0.150	0.230	0.230	0.283	0.283	0.513	0.571	0.571	1.020	1.379	2.206
50% nominal torque	Si70	0.036	0.036	0.093	0.093	0.142	0.142	0.173	0.173	0.310	0.346	0.346	0.619	0.843	1.350
	NM45	0.039	0.039	0.100	0.100	0.153	0.153	0.186	0.186	0.333	0.372	0.372	0.665	0.907	1.450
	SM50	0.041	0.041	0.106	0.106	0.162	0.162	0.198	0.198	0.355	0.396	0.396	0.708	0.965	1.543
	SM60	0.045	0.045	0.117	0.117	0.180	0.180	0.219	0.219	0.393	0.438	0.438	0.785	1.019	1.710
	SM70	0.062	0.062	0.161	0.161	0.246	0.246	0.300	0.300	0.538	0.600	0.600	1.074	1.462	2.340
	SM80	0.084	0.084	0.216	0.216	0.332	0.332	0.404	0.404	0.724	0.808	0.808	1.445	1.969	3.150
75% nominal torque	Si70	0.061	0.061	0.156	0.156	0.233	0.233	0.294	0.294	0.527	0.589	0.589	1.055	1.433	2.293
	NM45	0.054	0.054	0.138	0.138	0.205	0.205	0.260	0.260	0.465	0.520	0.520	0.931	1.267	2.025
	SM50	0.060	0.060	0.152	0.152	0.227	0.227	0.287	0.287	0.514	0.575	0.575	1.029	1.399	2.237
	SM60	0.072	0.072	0.183	0.183	0.272	0.272	0.344	0.344	0.617	0.690	0.690	1.235	1.677	2.685
	SM70	0.089	0.089	0.227	0.227	0.338	0.338	0.427	0.427	0.766	0.857	0.857	1.533	2.081	3.334
	SM80	0.135	0.135	0.344	0.344	0.512	0.512	0.647	0.647	1.159	1.296	1.296	2.320	3.153	5.045
100% nominal torque	Si70	0.104	0.104	0.250	0.250	0.372	0.372	0.471	0.471	0.843	0.941	0.941	1.686	2.296	3.665
	NM45	0.081	0.081	0.193	0.193	0.288	0.288	0.364	0.364	0.652	0.727	0.727	1.303	1.267	2.834
	SM50	0.093	0.093	0.224	0.224	0.333	0.333	0.422	0.422	0.755	0.842	0.842	1.509	2.399	3.282
	SM60	0.118	0.118	0.283	0.283	0.422	0.422	0.534	0.534	0.956	1.067	1.067	1.912	2.603	4.157
	SM70	0.138	0.138	0.329	0.329	0.491	0.491	0.621	0.621	1.112	1.241	1.241	2.224	3.027	4.836
	SM80	0.229	0.229	0.549	0.549	0.818	0.818	1.036	1.036	1.854	2.070	2.070	3.708	5.049	8.063
Allowable Heat Loading @ 30°C [W] P_{KW}	Si70	605	605	840	840	1065	1065	1180	1180	1450	1560	1560	2000	2250	2525
	NM45	195	195	300	300	365	365	420	420	540	590	590	750	910	1050
	SM50	195	195	300	300	365	365	420	420	540	590	590	750	910	1050
	SM60	195	195	300	300	365	365	420	420	540	590	590	750	910	1050
	SM70	205	205	320	320	390	390	450	450	575	630	630	805	980	1135
	SM80	220	220	345	345	420	420	490	490	635	700	700	890	1100	1265
Radial Stiffness* No Load [N/mm]	Si70	797	797	1089	1089	1610	1610	1380	1380	1595	2760	2760	3189	4177	3726
at T_{KN}[N/mm]	Si70	2538	2538	3488	3488	5152	5152	4408	4408	5098	8801	8801	10181	13387	11883
Axial Stiffness* No Load [N/mm]	Si70	299	299	422	422	790	790	529	529	636	1503	1503	1763	2407	4063
at T_{KN}[N/mm]	Si70	1288	1288	1809	1809	3389	3389	2285	2285	2745	6486	6486	7314	10399	13125

*Radial and axial stiffness values for other grades are available on request

Design Variations

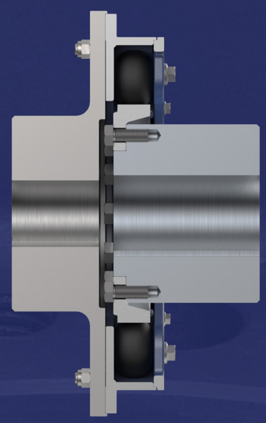
The HTB and HTB-GS couplings can be adapted to meet customer requirements as can be seen from some of the design variations below. For a more comprehensive list contact Renold Hi-Tec.

Coupling to Suit Existing Hub



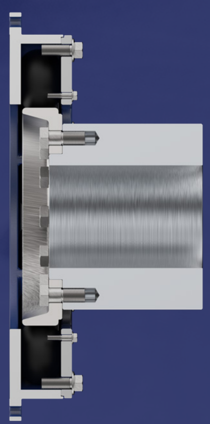
Existing hub fitment. Coupling inner member designed to suit existing hub design

Shaft to Shaft Coupling



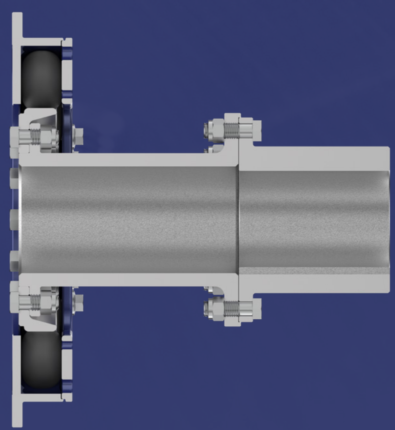
Shaft to Shaft Coupling. Designed for use on electricmotor drives and power take off applications

Reversed Inner Member Coupling



Coupling with reversed inner member to increase distance between flywheel face and shaft end

Spacer Coupling



Spacer coupling. Used to increase the distance between shaft ends and allow easy access to driven and driving machine

Global services

Head office Renold locations

Internal support
Sales team embedded in the manufacturing site with unrivalled product knowledge

Large engineering team
Our team can design a quality coupling to match your exact requirements

Manufacturing facility
Designed and manufactured in house by Renold; giving ultimate control on our solutions

History and Longevity
Manufacturing in the UK for over 100 years and commitment in our facilities for the long term, we are here to stay

Excellent Communication
From an accessible sales team, weekly order updates and a global sales network we make it easy to communicate

Record investment
Heavy investment in our business; spending millions of pounds upgrading CNC equipment, metrology arms and the newest software and test rigs

Get in touch

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