

# HITEX COUPLINGS



## HES BACKLASH-FREE JAW COUPLINGS

**HITEX**  
POWER TRANSMISSION COMPONENTS



# BACKLASH-FREE JAW COUPLINGS



## Specifications

- Torque range  
1 – 1.175 Nm
- Backlash-free
- Failsafe
- Vibration reducing
- Axial plug-in
- Maintenance free

## Coupling selection

The HES backlash-free jaw coupling selection should be made according to DIN 740-2. Proper dimensioning of the coupling should be done to ensure that the permissible coupling load never is exceeded in any operating condition.

The largest possible load produced by rated torque  $T_N$  should be used as a basis. Verify the rated torque of the application ( $T_N$ ) by the following formula:

$$T_N \text{ (Nm)} = 9550 \cdot \frac{P \text{ (kW)}}{n \text{ (rpm)}}$$

The nominal torque of the coupling should be equal or higher to the application torque taking the ambient temperature ( $S_t$ ) and Torsional stiffness factor ( $S_d$ ) in consideration.

$$TK_N \geq T_N \cdot S_t \cdot S_d$$

The maximum torque of the coupling should be equal or higher to the peak torque ( $T_s$ ) that might occur during operation.

$$T_{Kmax} \geq T_s \cdot S_t \cdot S_d$$

To verify the peak torques ( $T_s$ ) the maximum driving torque in Nm ( $T_{AS}$ ) giving by engine manufacturer is to be multiplied by the rotational inertia coefficient ( $m_A/m_L$ ) and Operating factor. The rotational inertia coefficient is to calculate considering the moment of inertia of the motor-side ( $J_L$ ) and inertia of the driven-side ( $J_A$ ).

$$\text{Motor-side peaks: } T_s = T_{AS} \cdot m_A \cdot S_A$$

$$m_A = \frac{J_L}{J_A + J_L}$$

$$\text{Driven-side peaks: } T_s = T_{LS} \cdot m_L \cdot S_L$$

$$m_L = \frac{J_A}{J_A + J_L}$$

## Servicefactors

Torsional stiffness factor $S_d$		
Tooling machines	Positioning systems (x - y axis)	Shaft- or angle encoders
2 - 5*	3 - 8*	10

\*When applying 64 Sh-D spider, at least use factor 4

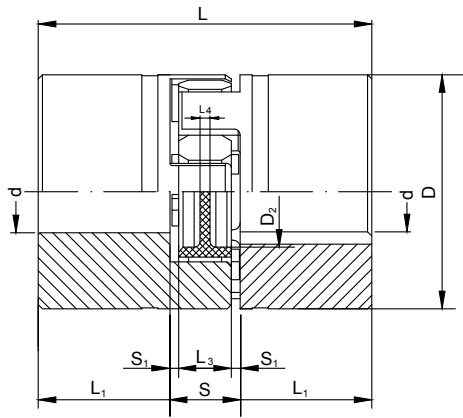
Servicefactor for temperature $S_t$				
Temperature range	-30° C +30° C	+40° C	+60° C	+80° C
$S_t$	1,0	1,2	1,4	1,8

Servicefactor for shocks $S_A$	
Light shock load	1,0
Medium shock load	1,4
Heavy shock load	1,8

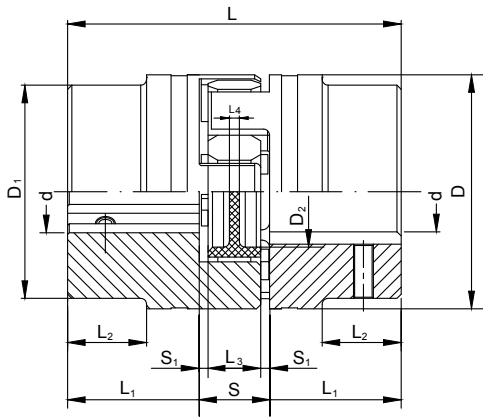
### Technical data

Size	Spider shore	Torque (Nm)		Max. speed nkmax (1/min)			Torsion spring stiffness		Radial stiffness	Max. displacements		
				for hub design			C <sub>stat</sub> (Nm/rad)	C <sub>dyn</sub> (Nm/rad)		C <sub>r</sub> (N/mm)	Δka (mm)	Δkr (mm)
		T <sub>KN</sub>	T <sub>KNmax</sub>	1.0	2.0/2.1	6.0						
7	80 Sh-A	0,7	1,4	34.100	26.000		8,6	26	114	0,6	0,15	1,1
	92 Sh-A	1,2	2,4				14,3	43	219	0,6	0,1	1
	98 Sh-A	2	4				22,9	69	421	0,6	0,06	0,9
	64 Sh-D	2,4	4,8				34,8	103	630	0,6	0,04	0,8
9	80 Sh-A	1,8	3,6	23.800	18.000		17	52	125	0,8	0,19	1,1
	92 Sh-A	3	6				31,5	95	262	0,8	0,13	1
	98 Sh-A	5	10				51,6	155	518	0,8	0,08	0,9
	64 Sh-D	6	12				74,6	224	769	0,8	0,05	0,8
14	80 Sh-A	4	8	15.900	12.000	25000	60	180	153	1	0,21	1,1
	92 Sh-A	7,5	15				114,6	344	335	1	0,15	1
	98 Sh-A	12,5	25				171,9	513	655	1	0,09	0,9
	64 Sh-D	16	32				234,2	702	855	1	0,06	0,8
19	80 Sh-A	4,9	9,8	11.900	9.500	18.500	340	1.030	582	1,2	0,15	1,1
	92 Sh-A	10	20				570	1.720	1.125	1,2	0,1	1
	98 Sh-A	17	34				860	2.580	2.010	1,2	0,06	0,9
	64 Sh-D	21	42				1.240	3.720	2.950	1,2	0,04	0,8
24	92 Sh-A	35	70	8.650	6.950	13.900	1.430	4.300	1.490	1,4	0,14	1
	98 Sh-A	60	120				2.060	6.190	2.550	1,4	0,1	0,9
	64 Sh-D	75	150				2.980	8.930	3.695	1,4	0,07	0,8
28	92 Sh-A	95	190	7.350	5.850	11.800	2.290	6.880	1.785	1,5	0,15	1
	98 Sh-A	160	320				3.440	10.314	3.210	1,5	0,11	0,9
	64 Sh-D	200	400				4.350	13.050	4.350	1,5	0,08	0,8
38	92 Sh-A	190	380	5.950	4.700	9.600	4.580	13.752	2.350	1,8	0,17	1
	98 Sh-A	325	650				7.160	21.486	4.410	1,8	0,12	0,9
	64 Sh-D	405	810				10.540	31.620	6.475	1,8	0,09	0,8
42	92 Sh-A	265	530	5.000	4.000	8.000	6.300	15.680	2.440	2	0,19	1
	98 Sh-A	450	900				19.200	37.692	5.575	2	0,14	0,9
	64 Sh-D	560	1.120				27.580	69.825	7.280	2	0,1	0,8
48	92 Sh-A	310	620	4.550	3.500	7.100	7.850	18.400	2.590	2,1	0,23	1
	98 Sh-A	525	1.050				22.370	45.620	5.950	2,1	0,16	0,9
	64 Sh-D	655	1.310				36.200	99.750	8.280	2,1	0,11	0,8
55	92 Sh-A	410	820	3.950	3.000	6.350	15.480	21.375	2.980	2,2	0,24	1
	98 Sh-A	685	1.370				42.120	61.550	6.690	2,2	0,17	0,9
	64 Sh-D	825	1.650				105.730	130.200	9.250	2,2	0,12	0,8
65	92 Sh-A	940	1.880	3.500	2.800	5.600	17.900	23.800	3.245	2,6	0,25	1
	64 Sh-A	1.175	2.350				118.500	189.190	8.870	2,6	0,18	0,9

# BACKLASH-FREE JAW COUPLINGS

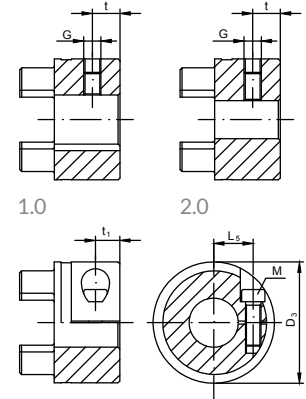


size 7 – 38

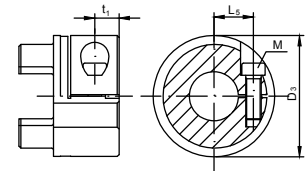


size 42 – 65

Hub designs



size 7 – 14 2.0 without keyway  
2.1 with keyway



size 19 - 65 2.0 without keyway  
2.1 with keyway



## HES Standard

Size	Max. finish bore d			Dimensions (mm)											Thread for setscrews		Clamping screw DIN EN ISO 4762				
	1.0	2.0	2.1	D	D <sub>1</sub>	D <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	S	S <sub>1</sub>	G	t	M	L <sub>s</sub>	t <sub>1</sub>	D <sub>3</sub>	T <sub>A</sub> (Nm)	
7	3	7	7	14			22	7		6	6,0	8	1,0	M3	2,5	M2	5,0	3,5	16,5	0,37	
9	4	11	11	20		7,2	30	10		8	1,5	10	1,0	M3	5	M2,5	7,5	5	23,4	0,76	
14	5	16	16	30		10,5	35	11		10	2,0	13	1,5	M4	5	M3	11,5	5	32,2	1,34	
19	6	24	24	40		18	66	25		12	3,0	16	2,0	M5	10	M6	14,5	11	45,7	10,5	
24	8	28	28	55		27	78	30		14	3,0	18	2,0	M5	10	M6	20,0	10,5	57,4	10,5	
28	10	38	38	65		30	90	35		15	4,0	20	2,5	M8	15	M8	25,0	11,5	72,6	25	
38	12	45	45	80		38	114	45		18	4,0	24	3,0	M8	15	M8	30,0	15,5	83,3	25	
42	14	55	45	95	85	46	126	50	28	20	4,0	26	3,0	M8	20	M10	32,0	18	93,3	69	
48	15	62	55	105	95	51	140	56	32	21	4,0	28	3,5	M8	20	M12	36,0	21	105	120	
55	20	74	68	120	110	60	160	65	37	22	4,5	30	4,0	M10	20	M12	45,5	26	120	120	
65	22	80	70	135	115	68	185	75	47	26	4,5	35	4,5	M10	20	M12	45,0	33	124	120	

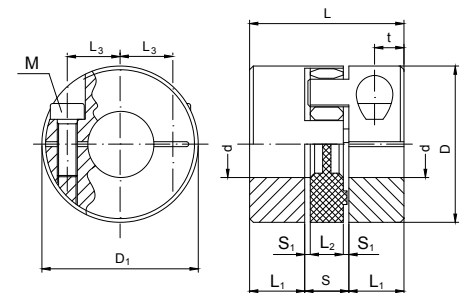
## Transmittable torques TR (Nm) of the clamping hubs designs 2.0

Size	Ø4	Ø5	Ø6	Ø7	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70
7	0,9	0,95	1	1,1																										
9	2,1	2,2	2,3	2,4	2,5	2,7	2,8																							
14		4,7	4,8	5	5,1	5,5	5,6	6,1	6,3	6,5																				
19					25	27	27	29	30	31	32	32	34																	
24						34	35	36	38	38	39	40	41	42	43	45	46													
28								80	81	81	84	85	87	89	91	92	97	99	102	105	109									
38									92	94	97	98	99	102	104	105	109	112	113	118	122	123	126	130						
42													232	238	244	246	255	260	266	274	283	288	294	301	309	315				
48																393	405	413	421	434	445	454	462	473	486	494	514			
55																			473	486	498	507	514	526	539	547	567	587	608	
65																				507	518	526	535	547	559	567	587	608	627	648



HES Compact													
Size	Max. finish bore d	Dimensions (mm)									Clamping screw		
		D	D <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	S	S <sub>1</sub>	G	t	M	T <sub>A</sub> (Nm)
7	7	14	16.6	18	5	6	5	8	1	2.5	2,5	M2	0.37
9	11	20	21.3	24	7	8	6,7	10	1	3.5	3,5	M2.5	0.75
14	16	30	30.5	32	9.5	10	9,6	13	1,5	5	4,5	M4	5
19	21	40	45.7	50	17	12	14	16	2	8.5	9	M6	10
24	32	55	56.4	58	20	14	20	18	2	10	11	M6	10
28	35	65	72.6	62	21	15	23,8	20	2,5	11	12	M8	25
38	45	80	83.3	86	31	18	30,5	24	3	15	16	M10	49

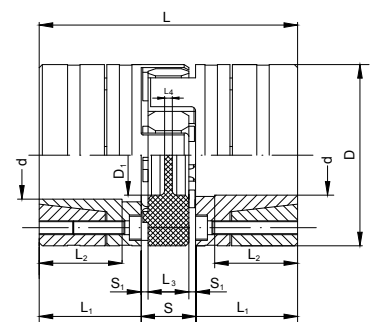
Transmittable torques TR (Nm) of the compact clamping hubs																											
Size	Ø3	Ø4	Ø5	Ø6	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45		
7	0,7	0,9	1,1	1,2																							
9		1,7	2,1	2,4	3,0	3,2	3,4	3,6																			
14			9,0	10,6	11,5	11,8	12,0	13,4	14,0	14,3	14,5	14,8															
19					25,0	25,7	26,3	27,0	28,4	29,0	29,7	31,1	31,7	32,4	25,0												
24						21	23	25	30	32	34	38	40	42	51	53	59	63	68								
28									54	58	62	70	74	78	93	97	109	116	124	136							
38										92	99	111	117	123	148	154	173	185	197	216	234	247	259	278			



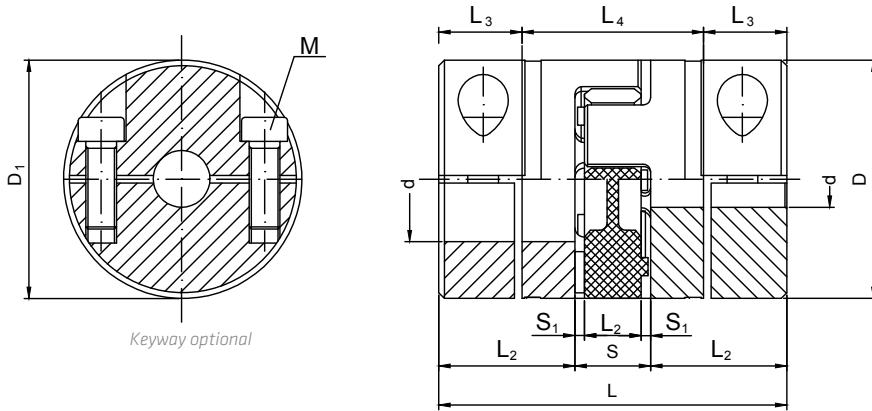
HES 6.0 aluminium hub, steel clamping ring																
Size	Max. finish bore d	Dimensions (mm)									Clamping screw			Mass moment of inertia hub* J (kgm <sup>2</sup> )	Weight hub* m (kg)	
		D	D <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	S	S <sub>1</sub>	M	Number	T <sub>A</sub> (Nm)			
14	14	30	10,5	50	18,5	30	10	2,0	13	1,5	M3	4	1,34	0,04 x 10 <sup>-4</sup>	0,026	
19	20	40	18	66	25	40	12	3,0	16	2,0	M4	6	3	0,19 x 10 <sup>-4</sup>	0,062	
24	28	55	27	78	30	55	14	3,0	18	2,0	M5	4	6	0,78 x 10 <sup>-4</sup>	0,132	
28	38	65	30	90	35	65	15	4,0	20	2,5	M5	8	6	1,70 x 10 <sup>-4</sup>	0,201	
38	48	80	38	114	45	80	18	4,0	24	3,0	M6	8	10	5,17 x 10 <sup>-4</sup>	0,411	
42	50	95	46	126	50	95	20	4,0	26	3,0	M8	4	25	11,17 x 10 <sup>-4</sup>	0,625	
48	55	105	51	140	56	105	21	4,0	28	3,5	M10	4	49	18,81 x 10 <sup>-4</sup>	0,831	

\* hub with max. bore diameter

Transmittable torques TR (Nm) of the 6.0 clamping ring hubs																									
Size	Ø6	Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	
14	9	14	15	23																					
19		41	45	62	68	67	83	90																	
24					72	90	97	112	120																
28						189	188	237	250	280	307	310	353	389											
38								337	356	398	436	424	501	533	572	585									
42										445	506	470	566	581	647	630	728	836	858						
48														955	999	1.092	1.091	1.230	1.381	1.334	1.540				



# BACKLASH-FREE JAW COUPLINGS



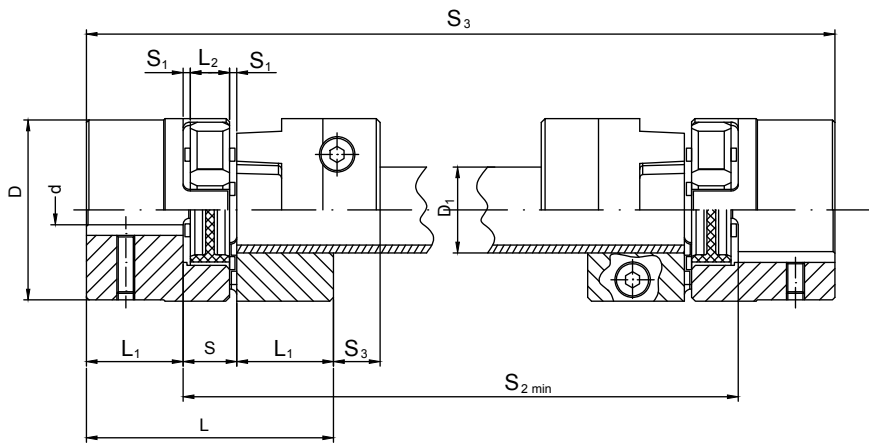
## HES A-H

Size	Max. finish bore d	Dimensions (mm)									Clamping screw		Mass moment of inertia hub*	Weight hub*
		D	D <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	S	S <sub>1</sub>	M	T <sub>A</sub> (Nm)		
19	20	40	46	66	25	12	17,5	31	16	2	M6	10	16,6 x 10 <sup>-6</sup>	77 x 10 <sup>-3</sup>
24	28	55	57,5	78	30	14	22	34	18	2	M6	10	77,3 x 10 <sup>-6</sup>	161 x 10 <sup>-3</sup>
28	38	65	73	90	35	15	25	40	20	2,5	M8	25	173 x 10 <sup>-6</sup>	240 x 10 <sup>-3</sup>
38	45	80	83,5	114	45	18	33	48	24	3	M8	25	496 x 10 <sup>-6</sup>	470 x 10 <sup>-3</sup>
42	50	95	93,5	126	50	20	39	48	26	3	M10	49	2409 x 10 <sup>-6</sup>	1770 x 10 <sup>-3</sup>

\* hub with max. bore diameter

## Transmittable torques TR (Nm) of the A-H hubs without keyway

Size	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø46	Ø48	Ø50
19	17	21	23	30	32	34	38	40	42														
24		21	23	30	32	34	38	40	42	47	51	53	59										
28				54	58	62	70	74	78	86	93	97	109	117	124	136	148						
38							70	74	78	86	93	97	109	117	124	136	148	156	163	175			
42										136	149	155	174	186	198	217	235	248	260	279	285	297	310



## HES ZR

Size	Max. finish bore d	Dimensions (mm)										Clamping screw		Friction torque	
		D	D <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	S <sub>2.min</sub>	S <sub>3</sub>	M	T <sub>A</sub> (Nm)	T <sub>R</sub> (Nm)	
14	16	30	14x2,5	35	11	10	13	1,5	please specify for orders and inquiries	71	S <sub>2</sub> + 22	M3	1,34	6,1	
19	24	40	20x3,0	66	25	12	16	2		110	S <sub>2</sub> + 50	M6	10,5	34	
24	28	55	25x2,5	78	30	14	18	2		128	S <sub>2</sub> + 60	M6	105	45	
28	38	65	35x4,0	90	35	15	20	2,5		145	S <sub>2</sub> + 70	M8	25	105	
38	45	80	40x4,0	114	45	18	24	3		180	S <sub>2</sub> + 90	M8	25	123	