

SINULASTIC®

highly flexible flange couplings

Description of product and application

The SINULASTIC® is a highly flexible flange coupling based on a disk-shaped coupling body. Four basic versions cover a wide range of applications primarily for diesel engine drives.

The main task of the coupling is reducing torsional vibrations resulting from excitations of the I. C.-engine during standard operation and misfire operation as well as protecting the drive from overload. It can be used both for variable-speed and constant speed drives, while a supercritical selection of the drive train above resonance level is always made. It requires only very few (axial) installation space due to its compact shape.

Depending on the type the coupling is pluggable and compensates for displacements. It is a non-slip or shear type and radially mountable.

The elastomer element is available in various qualities for all types. It is composed of natural rubber compounds optimised over many years (SN, MN, HN, UN up to 100 °C) or upon request of synthetical EPDM material for higher temperatures (SE, ME, HE, UE up to 120 °C) as well as silicone rubber (SC, MC up to 120 °C). The various kinds of rubber hardness cover one application and torque range per size. The vibratory properties of the four types are compatible within one size.

A wide standard portfolio of hub connections covers a large variety of shaft configurations on the driven side while special connections can be implemented.



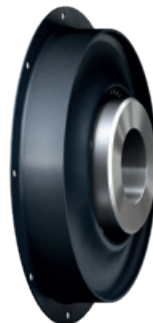
SINULASTIC® - The types



A



T



B



V

SINULASTIC® A was developed from the design of the renowned disk coupling with plug-in spline between elastomer and flange ring as well as a hub vulcanized on. The tooth shape that is subject to high loads particularly with alternating loads in the contact area between engine flange and rubber was extensively optimized, the sinusoidal tooth shape resulting from that is eponymous for the series. The engine flange was executed by a deep-drawn sheet metal section creating a smooth surface to the elastomer. Another benefit is the tight contact gap for easy mountability with simultaneously highly sound and defined form fit.

In contrast to type A, a Taperlock shaft connection as a standard version with feather key is used with SINULASTIC® T. The modular concept makes use of the plug-in ability of type A on the flange side.

Type B and V make use of a deep-drawn and inherently stable flange ring that the elastomer part is externally vulcanized on. This results in a low-cost solution for high speeds and overloads.

In combination with the renowned BoWex® inner hub the SINULASTIC® B as an all-rounder of the overall series is formed. The so-called BoWex® hub defines a pluggable connection resistant to high loads as well as favourable adaptations on the driven side up to long driving shaft systems owing to the potentials for particularly high displacements. The hub and connection variants of BoWex®-ELASTIC are fully compatible with the elastomers of this series.

SINULASTIC® V is favourably used where the ability for axial plug-in is not required. A resulting radial assembly is realised by a split ring on the hub side.

The slim shape of the elastomers allows for wear-free displacements in axial, radial and angular direction, while the coupling element is optimally suitable for not flange-mounted assembly, i. e. for system configurations set up freely.

SINULASTIC®

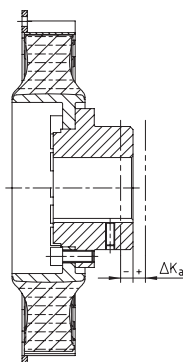
highly flexible flange couplings

Properties of types by comparison

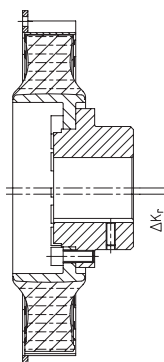
Features	Types		
	SINULASTIC® A SINULASTIC® T	SINULASTIC® V	SINULASTIC® B
Rated torque T_{KN}	Compatible within the series		
Maximum torque T_{Kmax}	$\geq 2x T_{KN}$	$3x T_{KN}$	$3x T_{KN}$
Vibratory properties, e. g. torsional stiffness	Compatible within the series		
Materials ¹⁾	Natural rubber (NR) in the hardness ranges WN, SN, MN, HN synthetical rubber (EPDM) in the hardness ranges WE, SE, ME, HE silicone rubber (Si) in the hardness ranges SC, MC		
Plug-in	Yes	No	Yes
Radial assembly	Partially possible	Yes	No
Mounting length	++	Ø	++
Axial displacement	++	+	++
Radial displacement	Ø	+	+
Angular displacement	Ø	++	++
Standard	For flywheel flange and shaft connection (SAE J620, DIN 5480 et seqq., DIN 6281, etc.)		
special solutions	Bearing-mounted connecting coupling, with failure protection, combination with shifting unit		Cardanic offset joint, failure protection, shaft systems
	Application-specific shaft connections of elastomer elements		

¹⁾ The standard materials and availabilities depend on the size and type, special compounds available on request

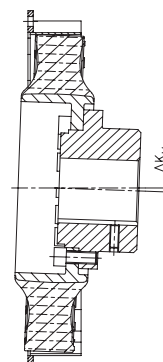
Displacements of type A/T



Axial displacement



Radial displacement



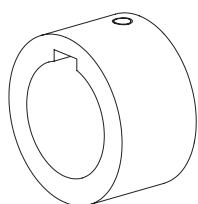
Angular displacement

SINULASTIC® size		20	28	38	53	96	114	140	180
Perm. axial displacement ΔK_A [mm] ²⁾		±2.0	±3.0	±3.0	±3.0	±3.0	±3.0	±3.0	±3.0
Perm. radial displacement ΔK_r [mm]	1500 rpm	0.8	1.1	1.1	1.1	1.25	1.25	1.5	1.5
	$n_{max.}$	0.6	0.8	0.8	0.8	0.9	0.9	1.1	1.1
	max. ¹⁾	1.6	2.2	2.2	2.2	2.5	2.5	3.0	3.0
Perm. angular displacement ΔK_w [degree]	1500 rpm	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4
	$n_{max.}$	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3
	max. ¹⁾	1.1	0.9	0.9	0.9	0.8	0.8	0.6	0.6

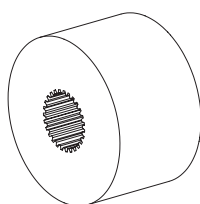
¹⁾ With assembly, for a short time resp. rarely with downtime or start-up operation as well as exceptional load conditions.

²⁾ Plug-in fit in the tooth contact allows for alternative mounting lengths

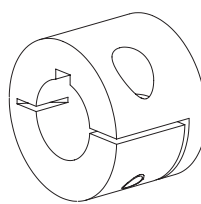
Types of hubs type AK / AL ¹⁾



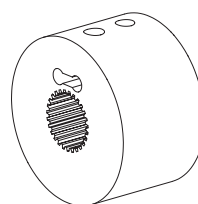
Type 1.0
with feather keyway
and setscrew
(acc. to standard AK, AL)



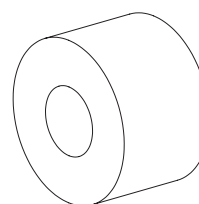
Type 1.3
spline toothing



Type 2.6
clamping hub double slot,
with feather keyway



Type 3.1
spline/clamping hub N



Type 8.0
taper interference fit

Type 8.1
cylindrical
interference fit

¹⁾ Dimensions and type may differ depending on size, other types of hubs on request

SINULASTIC®

highly flexible flange couplings

Technical data

Natural rubber (NR)														
Size	Elastomer type	Torque [Nm]				Dynamic torsion spring stiffness C_{dyn} [Nm/rad] ²⁾		Relative damping ψ [-]		Perm. damping power [W] ³⁾			Operating speed [rpm]	
		T_{KN} ¹⁾	T_{Kmax} 50.000 LA [Nm]	T_{Kmax} 1.000 LA [Nm]	T_{KW}	30 °C	60 °C	30 °C	60 °C to 80 °C	30 °C	60 °C	80 °C	n	n_{max}
20	SN	1800	2700	3600	720	7500	6150	1.00	0.70	210	130	80	2700	3000
	MN	2000	3000	4000	800	11500	9430	1.10	0.77	240	149	91	2700	3000
	HN	2500	3750	7500	1000	18500	15170	1.30	0.91	270	167	103	3240	3600
	UN	2850	4275	8550	1140	22000	18040	1.40	0.98	290	180	110	3240	3600
28	WN	2000	3000	4000	800	9800	8036	0.90	0.63	240	149	91	2340	2600
	SN	2200	3300	4400	880	12500	10250	1.00	0.70	260	161	99	2340	2600
	MN	2800	4200	5600	1120	17000	13940	1.10	0.77	270	167	103	2340	2600
	HN	3400	5100	10200	1360	24000	19680	1.30	0.91	290	180	110	2520	2800
38	UN	3750	5625	11250	1500	30000	24600	1.40	0.98	310	192	118	2520	2800
	SN	3100	4650	6200	1240	15000	12300	1.00	0.70	275	171	105	2520	2800
	MN	3800	5700	7600	1520	22000	18040	1.10	0.77	300	186	114	2520	2800
	HN	4600	6900	13800	1840	35000	28700	1.30	0.91	330	205	125	2880	3200
53	UN	5100	7650	15300	2040	41000	33620	1.40	0.98	350	217	133	2880	3200
	SN	4200	6300	8400	1680	17000	13940	1.00	0.70	285	177	108	2340	2600
	MN	5300	7950	10600	2120	28000	22960	1.10	0.77	325	202	124	2340	2600
	HN	6200	9300	18600	2480	45500	37310	1.30	0.91	370	229	141	2700	3000
96	UN	7000	10500	21000	2800	52000	42640	1.40	0.98	400	248	152	2700	3000
	SN	8100	12150	16200	3240	75000	61500	1.00	0.70	480	298	182	2070	2300
	MN	10000	15000	20000	4000	100000	82000	1.10	0.77	500	310	190	2070	2300
	HN	11200	16800	33600	4480	135000	110700	1.30	0.91	510	316	194	2250	2500
114	UN	13200	19800	39600	5280	175000	143500	1.40	0.98	520	322	198	2250	2500
	SN	10000	15000	20000	4000	90000	73800	1.00	0.70	500	310	190	2070	2300
	MN	11400	17100	22800	4560	125000	102500	1.10	0.77	530	329	201	2070	2300
	HN	13400	20100	40200	5360	160000	131200	1.30	0.91	550	341	209	2250	2500
140	UN	15600	23400	46800	6240	190000	155800	1.40	0.98	560	347	213	2250	2500
	SN	13000	19500	26000	5200	106000	86920	1.00	0.70	540	335	205	1890	2100
	MN	14000	21000	28000	5600	149000	122180	1.10	0.77	550	341	209	1890	2100
	HN	16200	24300	48600	6480	235000	192700	1.30	0.91	570	353	217	2070	2300
180	UN	19000	28500	57000	7600	330000	270600	1.40	0.98	590	366	224	2070	2300
	SN	16000	24000	32000	6400	132000	108240	1.00	0.70	620	384	236	1890	2100
	MN	18000	27000	36000	7200	185000	151700	1.10	0.77	630	391	239	1890	2100
	HN	22000	33000	66000	8800	295000	241900	1.30	0.91	650	403	247	2070	2300
	UN	25000	37500	75000	1000	380000	311600	1.40	0.98	670	415	255	2070	2300

Synthetical rubber (EPDM)						
Size	Elastomer type	Torque [Nm]				
		T_{KN} ¹⁾	T_{Kmax} 50,000 LW	T_{Kmax} 1,000 LW	T_{KW}	
20	SE	1800	2700	3600	720	
	ME	2000	3000	4000	800	
	HE	2500	3750	7500	1000	
	UE	2850	4275	8550	1140	
28	SE	2200	3300	4400	880	
	ME	2800	4200	5600	1120	
	HE	3400	5100	10200	1360	
	UE	3750	5625	11250	1500	
38	SE	3100	4650	6200	1240	
	ME	3800	5700	7600	1520	
	HE	4600	6900	13800	1840	
	UE	5100	7650	15300	2040	
53	SE	4200	6300	8400	1680	
	ME	5300	7950	10600	2120	
	HE	6200	9300	18600	2480	
	UE	7000	10500	21000	2800	
96	SE	8100	12150	16200	3240	
	ME	10000	15000	20000	4000	
	HE	11200	16800	33600	4480	
	UE	13200	19800	39600	5280	
114	SE	10000	15000	20000	4000	
	ME	11400	17100	22800	4560	
	HE	13400	20100	40200	5360	
	UE	15600	23400	46800	6240	
140	SE	13000	19500	26000	5200	
	ME	14000	21000	28000	5600	
	HE	16200	24300	48600	6480	
	UE	19000	28500	57000	7600	
180	SE	16000	24000	32000	6400	
	ME	18000	27000	36000	7200	
	HE	22000	33000	66000	8800	
	UE	25000	37500	75000	1000	

Silicone rubber (SI)						
Size	Elastomer type	T_{KN} RT ⁴⁾	Torque [Nm] with +80 °C Ambient temperature ¹⁾			
			T_{KN} ¹⁾	T_{Kmax} 50,000 LW	T_{Kmax} 1,000 LW	T_{KW}
20	SC	1800	1390	2080	2770	555
	MC	2000	1540	2310	3080	620
28	SC	2200	1695	2540	3390	680
	MC	2800	2155	3235	4310	865
38	SC	3100	2390	3580	4770	955
	MC	3800	2925	4390	5850	1170
53	SC	4200	3235	4850	6465	1295
	MC	5300	4080	6120	8155	1635
96	SC	8100	6235	9350	12465	2495
	MC	9600	7390	11080	14770	2955
114	SC	9200	7080	10620	14155	2835
	MC	11400	8770	13155	17540	3510
140	SC	12500	9620	14435	19235	3850
	MC	14000	10770	16155	21540	4310
180	SC	16000	12310	18465	24620	4925
	MC	18000	13850	20770	27695	4800

¹⁾ T_{KN} Torque that can be constantly transmitted over the entire speed range.
Observe with selection DIN 740 part II (operating factor, temperature factor), parameters for an ambient temperature of 20 °C
²⁾ referring to 0.5 T_{KW}
³⁾ Here permanent damping power. Twice the damping power figure is permissible for one hour.
⁴⁾ Reference value with an ambient temperature of +20 °C

SINULASTIC®

highly flexible flange couplings

Pluggable disk coupling with optimal tooth contact



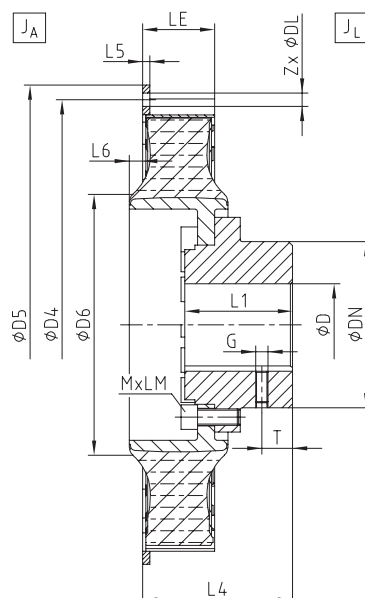
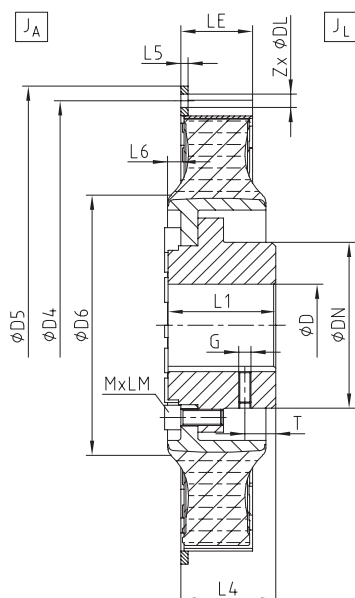
For legend of pictogram refer to flapper on the cover



Type AK

Type AL

Types AK and AL specify the standard with variable hub connections as a short or long version



Flange dimensions according to SAE J620 [mm]				
Nominal size	D5	D4	Z	DL
11 1/2"	352.42	333.37	8	11
14"	466.72	438.15	8	13
18"	571.50	542.90	6	17
21"	673.10	641.35	12	17
24"	733.42	692.15	12	21
Ø475	475	450	12	11

SINULASTIC® type AK / AL																			
Size	Flange connection acc. to SAE - J620						Dimensions [mm]												Weight [kg] ¹⁾
	11 1/2"	14"	18"	21"	24"	Ø475	Max. finish bore D	DN	D6	LE	L1	L4		L6	L7	MxLM	G	T	
												AK	AL						
20	●						80	112	164	65	75	90.5 +3.5/-4.5	127.5 +3.5/-4.5	5.5	41.0 13.6	M12x30	M10	30	0.0947 0.0533 13.70
		●																	0.1353 0.0533 14.79
			●																0.1873 0.1667 21.89
28				●			115	162	244	44	90	93.5 ±3	109 ±3	7.0	7.0	M16x40	M12	35	0.4968 0.1667 26.54
					●														0.2013 0.1667 22.15
						●													0.2444 0.1994 25.53
38							115	162	244	58	100	93.5 ±3	123 ±3	7.0	7.0	M16x40	M12	35	0.5539 0.1994 30.18
																			0.2584 0.1994 25.79
																			0.2906 0.2378 29.44
53							115	162	247	70	105	92.5 ±3	146 ±3	13.0	7.0	M16x40	M12	40	0.6000 0.2378 34.09
																			0.3046 0.2378 29.70
																			0.7310 1.0321 63.86
96							175	248	352	84	150	129 ±4	192 ±4	1.0	11.0	M20x50	-	-	1.5407 1.0321 72.34
																			2.2186 1.0321 77.90
																			0.8367 1.1212 68.00
114							175	248	352	98	150	129 ±4	206 ±4	1.0	11.0	M20x50	-	-	1.6464 1.1212 76.48
																			2.3243 1.1212 82.05
140							175	248	431	94	200	200 ±3.5	280 ±3.5	3.0	14.0	M20x60	-	-	1.6664 2.1577 101.52
																			2.5280 2.1577 108.59
180							175	248	431	114	200	200 ±3.5	300 ±3.5	3.0	14.0	M20x60	-	-	1.9539 2.4188 109.82
																			2.8167 2.4188 116.90

¹⁾ With max. bore

Ordering example:

SINULASTIC® 96	AK	MN	18	1.0	Ø150
Coupling size	Type	Elastomer type	Flange ØDA acc. to SAE or special	Hub type	Finish bore

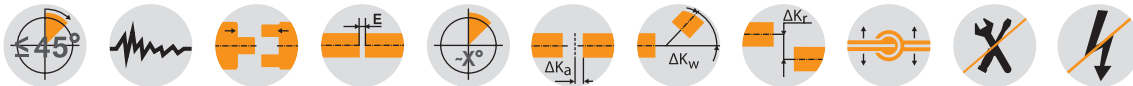
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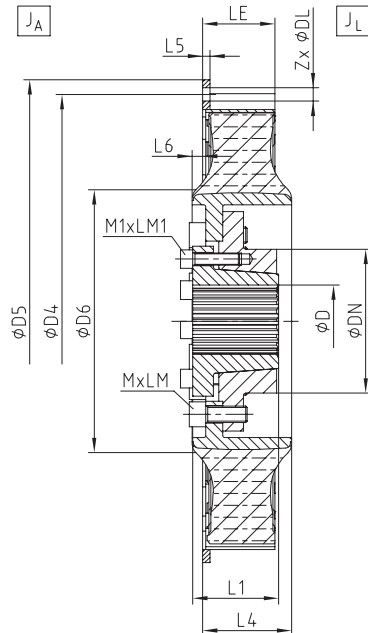
Pluggable disk coupling with optimal tooth contact



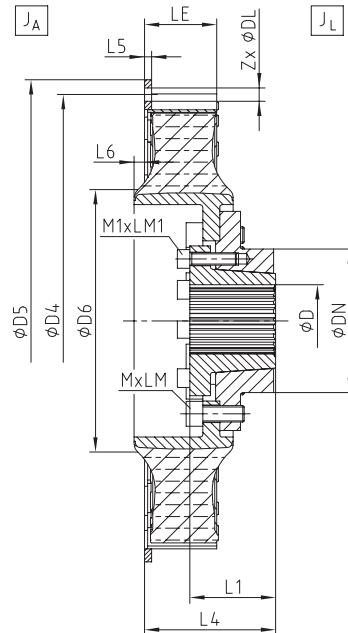
For legend of pictogram refer to flapper on the cover



Type AKC



Type ALC



Types AKC and ALC
identify the hub type
as a spline clamping ring hub

Flange dimensions according to SAE J620 [mm]				
Nominal size	D5	D4	Z	DL
11 1/2"	352.42	333.37	8	11
14"	466.72	438.15	8	13
18"	571.50	542.90	6	17
21"	673.10	641.35	12	17
24"	733.42	692.15	12	21
Ø475	475	450	12	11

SINULASTIC® type AKC / ALC																					
Size	Flange connection acc. to SAE - J620						Dimensions [mm]										Mass moment of inertia [kgm ²] ¹⁾		Weight [kg] ¹⁾		
							Finish bore D		DN	D6	LE	L1	L4		L6	L7				MxLM	M1xLM1
	11½"	14"	18"	21"	24"	Ø475	Pilot bored	max.					AK	AL							
	20	●						30	50	109	164	65	57	70.5 +3.5/-4.5	95.5 +3.5/-4.5	5.5	41.0 13.6	M12x30		M10x30	0.0947
		●																	0.1353	0.0520	15.02
28		●					46	65	139	244	44	63	56.5 ±3	72 ±3	7.0	7.0	M16x40	M10x40	0.1873	0.1525	21.15
			●																0.4968	0.1525	25.79
38			●				46	80	139	244	58	69	65 ±3	92 ±3	7.0	7.0	M16x40	M10x40	0.2013	0.1525	21.40
		●																	0.2444	0.1837	24.05
53			●				46	80	139	247	70	83	83 ±3	124 ±3	13.0	7.0	M16x40	M12x45	0.5539	0.1837	28.70
				●															0.2584	0.1837	24.31
		●																	0.2906	0.2240	28.72
			●																0.6000	0.2240	33.37
			●																0.3046	0.2240	28.98

¹⁾ With max. bore

Ordering example:	SINULASTIC® 53	AKC	MN	18	6.0	DIN 5480 - 60x2x28
	Coupling size	Type	Elastomer type	Flange ØDA acc. to SAE or special	Hub type	Finish bore

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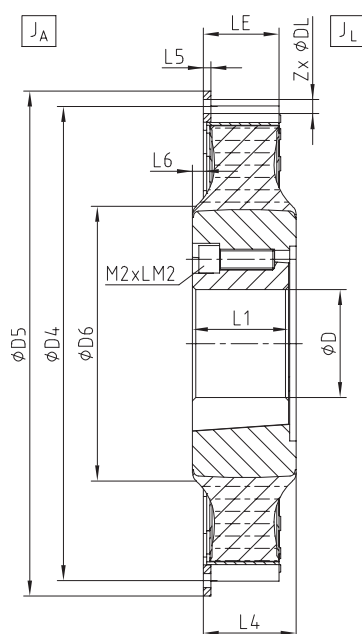
Pluggable disk coupling with optimal tooth contact



For legend of pictogram refer to flapper on the cover



Type T



Type T specifies the hub type as Taperlock shaft connection

Flange dimensions according to SAE J620 [mm]				
Nominal size	D5	D4	Z	DL
11 1/2"	352.42	333.37	8	11
14"	466.72	438.15	8	13
18"	571.50	542.90	6	17
21"	673.10	641.35	12	17
24"	733.42	692.15	12	21
Ø475	475	450	12	11

SINULASTIC® type T																			
Size	Flange connection acc. to SAE - J620						Dimensions [mm]								Taper clamping sleeve		Mass moment of inertia [kgm²] ¹⁾		Weight [kg] ¹⁾
							Finish bore D		D6	LE	L1	L4	L6	L7					
	11 1/2"	14"	18"	21"	24"	Ø475	Pilot bored	max.							J _A	J _L			
20	●						35	90	164	60	63.5	70.5 +3.5/-4.5	5.5	41.0	1/2"x38	3525	0.0947	0.0568	13.75
		●												13.6			0.1353	0.0568	14.83
28		●					35	90	244	44	63.5	57.0 ± 3	7.0	7.0	1/2"x38	3525	0.1873	0.1919	24.37
			●														0.4968	0.1919	29.02
						●												0.2013	0.1919
38		●					40	110	244	58	76.2	70.0 ± 3	7.0	7.0	5/8"x44	4030	0.2444	0.2404	28.68
			●														0.5539	0.2404	33.33
						●												0.2584	0.2404
53		●					55	125	247	70	89.0	83.0 ± 3	13.0	7.0	3/4"x50	4535	0.2906	0.2993	33.72
			●														0.6000	0.2993	38.36
						●												0.3046	0.2993

¹⁾ With max. bore

Ordering example:	SINULASTIC® 38	T	MN	14	TL	Ø100
	Coupling size	Type	Elastomer type	Flange ØDA acc. to SAE or special	Hub type	Finish bore