

MULTI MONT ASTRA

Flexible Claw Coupling with and without
Taper Bushes

www.reich-kupplungen.com



SIMPLY **POWERFUL.**





D2C – Designed to Customer

The guiding principle of Designed to Customer is the recipe for success behind REICH. In addition to the catalogue products, we supply our customers with couplings developed to their specific requirements. The designs are mainly based on modular components to provide effective and efficient customer solutions. The special nature of our close cooperation with our partners ranges from; consulting, development, design, manufacture and integration to existing environments, to customer-specific production, logistics concepts and after-sales service - worldwide. This customer-oriented concept applies to both standard products and production in small batch sizes.

The company policy at REICH embraces, first and foremost, principles such as customer satisfaction, flexibility, quality, prompt delivery and adaptability to the requirements of our customers.

REICH provides you with not only a coupling, but a solution:
Designed to Customer – SIMPLY **POWERFUL**.

D2C
Designed to Customer



MULTI MONT ASTRA

Contents

Coupling Information

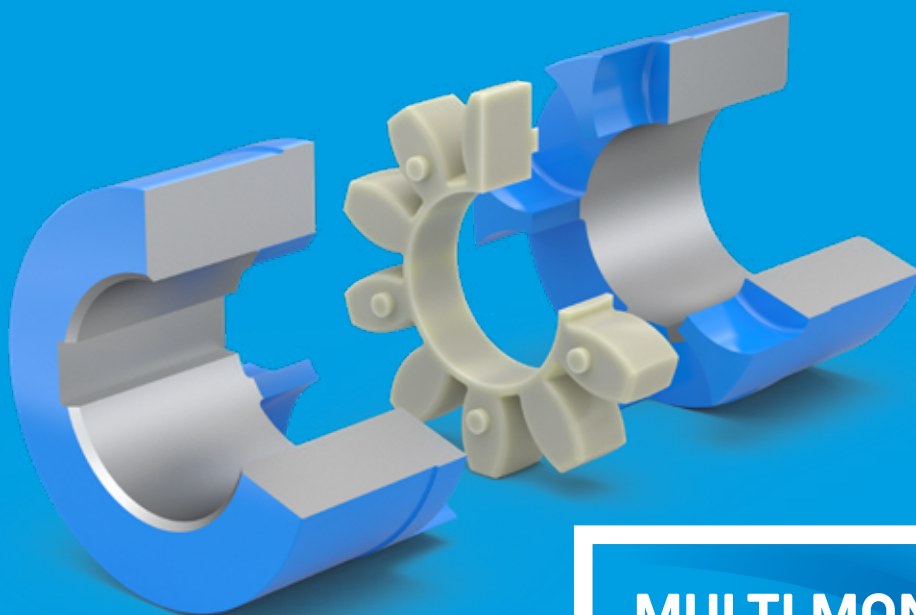
- 04** General Technical Description
- 05** Advantages
- 06** General Technical Data
- 07** Selection of the Coupling Size
- 08** Service Factors
- 09** Assignment of the Load Classification Factors to the Type of Driven Machine
- 12** Permissible Displacements
- 13** Weights and Moments of Inertia/Taper Bushes

Dimension Tables

- 10** Type MMA-W
- 11** Type MMA-T

MULTI MONT ASTRA

General Technical Description



MULTI MONT ASTRA-W

Nominal torques from 10 Nm to 3 600 Nm

MULTI MONT ASTRA Flexible Claw Coupling

The flexible MULTI MONT ASTRA coupling (short form: MMA) is a fail-safe claw coupling with flexible element for a torsionally flexible shaft connection. The advantage of the comprehensively machined MULTI MONT ASTRA coupling, and of the claw flanks in particular, is the precision of the running characteristic and the extended service life.

MULTI MONT ASTRA couplings are fail-safe up to the breaking torque of the claws and thus ensure maximum operational safety.

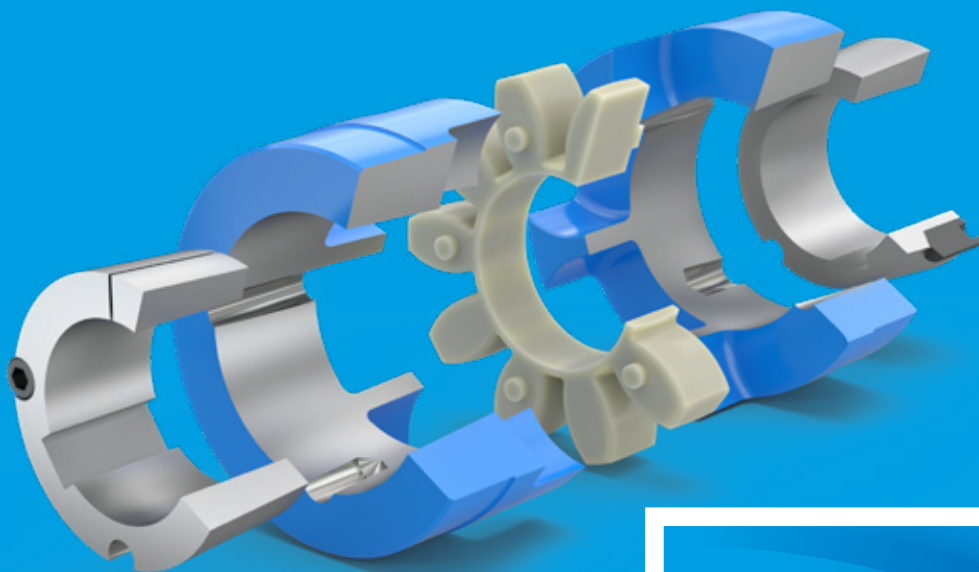
The N version of the flexible coupling element is available in a hardness of 92° Shore A (white) and the S version in a hardness of 98° Shore A (red). It is characterised by a resistance to wear and tear and also to oil, ozone and ageing. Shocks, torsional vibrations and noise are efficiently absorbed thanks to the flexibility of the coupling.

The flexible element of the coupling is dimensioned such that radial, axial and angular movements are compensated for between the two

coupling halves. The fixed position of the flexible element allows axial deformation so that no detrimental axial loads can act upon the machine bearings even if vibratory torques are encountered. The flexible element of the MULTI MONT ASTRA allows for a continuous load up to 80 °C. Application at low temperatures down to -20 °C permissible.

Minimum outside diameters combined with a maximum bore guarantee both, low weights and low moments of inertia. The flexible MULTI MONT ASTRA coupling is designed for plug-in mounting and for ease of alignment. The balancing quality complies with the DIN ISO 21940 quality range G16.

The MULTI MONT ASTRA coupling type MMA-T combines the advantages of the flexible coupling with the advantages of a taper bush system: quick and easy assembly for torsionally flexible connection of shafts and compensation of shaft misalignments. The MMA-T type with taper bushes offers the distinct advantage



MULTI MONT ASTRA-T

Nominal torques from 10 Nm to 3 600 Nm

that even in the event of major shaft tolerances, backlash-free and axial fixing on the shaft is ensured. In addition, the slide fit facilitates axial alignment of the coupling. The flexible element can be easily changed by axial movement of the coupling halves with

no need for removing connected machinery. MULTI MONT ASTRA coupling finds its applications in general engineering in all places where a reliable shaft connection is required between the motor and the driven machine.

MULTI MONT ASTRA

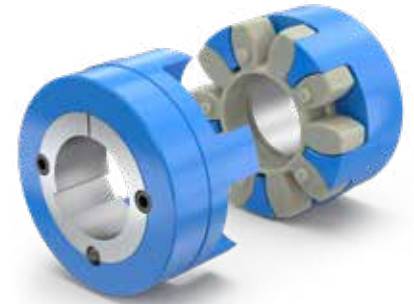
Advantages

Salient features and advantages of the MULTI MONT ASTRA claw coupling:

- Compensation of axial, radial and angular displacements
- Shock and vibration damping
- Fail safe and withstand high overloads
- Ease of assembly and alignment
- Maintenance-free

MULTI MONT ASTRA

General Technical Data



Standard Type

Torques for coupling fit with keyway

Coupling size	Max. speed at $V = 40 \text{ m/s}$ [min ⁻¹]	Element version N			Element version S			Permissible shaft displacement ²⁾		
		Nominal torque T_{KN} [Nm]	Maximum torque $T_{K \max}$ [Nm]	Alternating torque T_{KW} [Nm]	Nominal torque T_{KN} [Nm]	Maximum torque $T_{K \max}$ [Nm]	Alternating torque T_{KW} [Nm]	Axial ΔK_a [mm]	Radial ΔK_r [mm]	Angular ¹⁾ ΔK_w [°]
19	19000	10	20	2.6	17	34	4.4	1.2	0.20	1.2
24	14000	35	70	9	60	120	16	1.4	0.22	0.9
28	11800	95	190	25	160	320	42	1.5	0.25	0.9
38	9500	190	380	49	325	650	85	1.8	0.28	1.0
42	8000	265	530	69	450	900	117	2.0	0.32	1.0
48	7100	310	620	81	525	1050	137	2.1	0.36	1.1
55	6300	410	820	105	685	1370	178	2.2	0.38	1.1
65	5600	625	1250	163	940	1880	245	2.6	0.42	1.2
75	4750	1280	2560	333	1920	3480	499	3.0	0.48	1.2
90	3750	2400	4800	624	3600	7200	936	3.4	0.50	1.2

i 1) For speeds 1500 min⁻¹, alternative speeds see pages 10 - 11

2) For ambient temperature 30 °C

Technical Note

The technical data applies only to the complete coupling or the corresponding coupling elements. It is the customer's/user's responsibility to ensure there are no inadmissible loads acting on any of the components. In particular, existing connections, e.g. bolted connections, must be checked with regard to the torques to be transmitted. If necessary, further measures, such as additional reinforcement with pins, may be necessary. It is the customer's/user's responsibility to make sure the dimensioning of the shaft and keyed or other connection, e.g. shrinking or clamping connection,

is correct. All components that can rust are protected against corrosion as standard.

REICH have an extensive range of couplings and coupling systems to cover nearly every drive configuration. Customized solutions can be developed and manufactured even in small batches or as prototypes. In addition calculation programs are available for all necessary dimensioning.

MULTI MONT ASTRA

Selection of the Coupling Size

The coupling size should be selected to ensure that the permissible coupling load is not exceeded in any operating condition encountered. For drives which are not subject to periodically recurring fatigue torques the coupling design may be selected based on the driving torque with reference to the corresponding service factors. For drives with combustion engines or prime movers which are subject to periodically recurring vibratory torques, the final selection of the coupling should be verified by a full torsional vibration analysis which will be conducted by us on request.

In selecting the coupling size the following should be satisfied:

- The **nominal torque of the coupling** T_{KN} must be taken into account at every temperature and operating load of the coupling, whilst observing the service factors S (e.g: temperature factor S_t) shall be at least equal to the maximum nominal torque on the drive side T_{AN} ; the temperature in the immediate vicinity of the coupling must be taken into account.

$$T_{KN} \geq T_{AN} \cdot S_m \cdot S_t \cdot S_z$$

- The **nominal torque on the drive side** T_{AN} is calculated with the driving power P_{AN} and the coupling speed n_{AN} .

$$T_{AN} [Nm] = 9550 \frac{P_{AN} [kW]}{n_{AN} [min^{-1}]}$$

- The **maximum torque capacity of the coupling**, $T_{K \max}$ shall be at least equal to the highest torque T_{\max} encountered in operation while taking the temperature factor S_t into account.

$$T_{K \max} \geq T_{\max} \cdot S_t$$

- A continuous torsional vibration analysis to verify the coupling selection should confirm that the permissible **continuous fatigue torque** T_{KW} is at least equal to the highest fatigue torque T_W under reversing stresses encountered throughout the operating speed range while taking into account the temperature and frequency.

$$T_{KW} (10 \text{ Hz}) \geq T_W \cdot S_t \cdot S_f$$

- The **frequency factor** S_f allows for the frequency dependence of the permissible continuous fatigue torque under reversing stresses $T_{KW} (10 \text{ Hz})$ with an operating frequency f_x .

$$S_f = \sqrt{\frac{f_x}{10}}$$

MULTI MONT ASTRA

Service Factors

Load classification S_m

Prime mover	Load classification of the driven machine		
	G (uniform load)	M (medium load)	S (heavy load)
Electric motors, turbines, hydraulic motors	1.0	1.25	1.75

Start-up factor S_z

Starting frequency per hour	30	60	120	240	> 240
S_z	1.0	1.1	1.2	1.3	on request

Temperature factor S_t

Ambient temperature	-20 °C	+40 °C	+60 °C	+80 °C
S_t	1.0	1.2	1.5	1.8

MULTI MONT ASTRA

Assignment of the Load Classification Factors to the Type of Driven Machine

G =	uniform load
M =	medium load
S =	heavy load

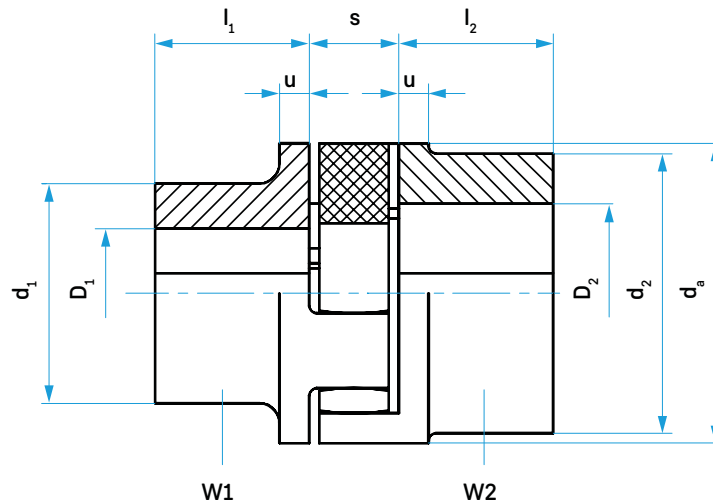
i For drives with periodic excitation of the machinery, the coupling selection shall be verified by means of a full torsional vibration analysis.

EXCAVATORS		GENERATORS, TRANSFORMERS		PUMPS	
S	Bucket conveyors	S	Frequency transformers	S	Reciprocating pumps
S	Travelling gears (caterpillar)	S	Generators	G	Centrifugal pumps (light liquids)
M	Travelling gears (rails)	S	Welding generators	M	Centrifugal pumps (viscous liquids)
M	Manoeuvring winches			S	Plunger pumps
M	Suction pumps			S	Pressure pumps
S	Bucket wheels	RUBBER MACHINERY		STONE AND CLAY WORKING MACHINES	
S	Cutter heads	S	Extruders	S	Breakers
M	Slewing gears	S	Calenders	S	Rotary kilns
		S	Pug mills	S	Hammer mills
		M	Mixers	S	Ball mills
		S	Rolling mills	S	Tube mills
BUILDING MACHINERY				S	Beater mills
M	Hoists	WOOD WORKING MACHINES		S	Brick presses
S	Concrete mixers	S	Barkers		
M	Road construction machinery	M	Planing machines	TEXTILE MACHINES	
		S	Wood working machines	M	Batchers
		S	Saw frames	M	Printing and dyeing machines
CHEMICAL INDUSTRY				M	Tanning vats
M	Cooling drums	CRANES		M	Willows
M	Mixers	S	Luffing gears	M	Looms
G	Agitators (light liquids)	S	Travelling gears	COMPRESSORS	
M	Agitators (viscous liquids)	S	Hoisting gears	S	Reciprocating compressors
M	Drying drums	M	Slewing gears	M	Centrifugal compressors
G	Centrifuges (light-weight)	M	Derricking jib gears	METAL ROLLING MILLS	
M	Centrifuges (heavy)			S	Plate shears
		PLASTIC INDUSTRY MACHINERY		M	Plate tilters
M	Pipeline pumps	S	Extruders	S	Ingots pushers
S	Rotary drilling equipment	S	Calenders	S	Block- and slab lines
		M	Mixers	S	Ingots handling machinery
CONVEYORS		M	Crushers	M	Wire drawing benches
M	Hauling winches			S	Descaling machines
S	Hoists	METAL WORKING MACHINES		S	Sheet mills
M	Link conveyors	M	Sheet metal bending machines	S	Heavy and medium plate mills
G	Belt conveyors (bulk material)	S	Plate straightening machines	M	Winding machines (strip and wire)
S	Belt conveyors (piece goods)	S	Hammers	S	Cold rolling mills
M	Belt bucket conveyors	S	Metal planing machines	M	Chain transfers
M	Chain conveyors	S	Presses	S	Billet shears
M	Circular conveyors	S	Shears	M	Cooling beds
M	Goods lifts	S	Forging presses	M	Cross transfers
G	Flour bucket conveyors	S	Punch presses	M	Roller tables (light)
M	Passenger lifts	G	Counter shafts, line shafts	S	Roller tables (heavy)
M	Apron conveyors	M	Machine tools, main drives	M	Roller straighteners
M	Screw conveyors	G	Machine tools, auxiliary drives	S	Tube welding machines
M	Ballast elevators			M	Trimming shears
S	Inclined hoists	FOOD INDUSTRY MACHINERY		S	Cropping shears
M	Steel belt conveyors	G	Filling machines	S	Continuous casting plants
M	Troughed chain conveyors	M	Kneading machines	M	Roller adjustment drives
		M	Mashing apparatus, crystallizers	S	Manipulators
BLOWERS, FANS¹⁾		G	Packaging machines	LAUNDRIES	
G	Lobe blowers P:n ≤ 0.007	M	Cane crushers	M	Tumblers
M	Lobe blowers P:n ≤ 0.07	M	Cane knives	M	Washing machines
S	Lobe blowers P:n > 0.07	S	Cane mills	WATER TREATMENT	
G	Blowers (axial/centrif.) P:n ≤ 0.007	M	Sugar beet cutters	M	Aerators
M	Blowers (axial/centrif.) P:n ≤ 0.07	M	Sugar beet washing machines	G	Screw pumps
S	Blowers (axial/centrif.) P:n > 0.07				
G	Cooling tower fans P:n ≤ 0.007	PAPER MACHINES			
M	Cooling tower fans P:n ≤ 0.07	S	Couches		
S	Cooling tower fans P:n > 0.07	S	Glazing cylinders		
G	Induced draught fans P:n ≤ 0.007	S	Pulpers		
M	Induced draught fans P:n ≤ 0.07	S	Pulp grinders		
S	Induced draught fans P:n > 0.07	S	Calenders		
G	Turbo blowers P:n ≤ 0.007	S	Wet presses		
M	Turbo blowers P:n ≤ 0.07	S	Willows		
S	Turbo blowers P:n > 0.07	S	Suction presses		

i 1) P = power of the driven machine in kW // n = speed in min⁻¹

MULTI MONT ASTRA

Type MMA-W



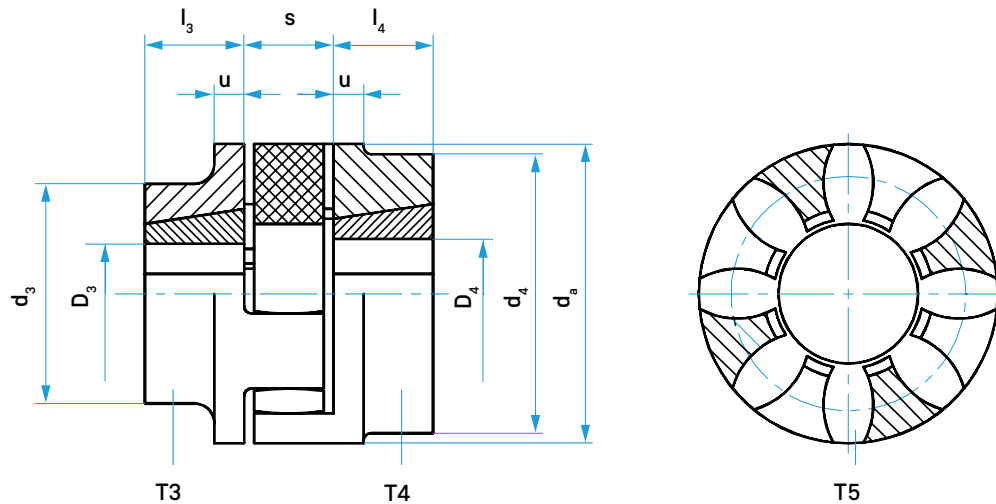
Coupling details

Coupling size	Part W1				Part W2				d _a	u	s
	D ₁		d ₁	l ₁	D ₂		d ₂	l ₂			
	min.	max.			min.	max.					
19	-	19	32	25	17	24	40	25	40	5	16
24	-	24	40	30	22	28	48	30	55	6	18
28	-	28	48	35	26	38	65	35	65	7	20
38	10	38	66	45	36	45	78	45	80	8	24
42	12	42	75	50	40	55	94	50	95	10	26
48	13	48	85	56	46	60	104	56	105	11	28
55	18	55	98	65	53	70	118	65	120	13	30
65	20	65	115	75	63	75	134	75	135	14	35
75	28	75	135	85	73	90	158	85	160	16	40
90	38	90	160	100	88	100	180	100	200	19	45

i Keyways acc. to DIN 6885/1, tolerance zone JS9

MULTI MONT ASTRA

Type MMA-T



Coupling details

Coupling size	Part T3					Part T4				
	min.	max.	Taper bush	d ₃	l ₃	min.	max.	Taper bush	d ₄	l ₄
19	-	-	-	-	-	-	-	-	-	-
24	10	22	1008	55	22	10	22	1008	55	22
28	10	25	1108	65	22	10	25	1108	65	22
38	10	25	1108	78	22	10	25	1108	78	22
42	14	40	1610	94	25	14	40	1610	94	25
48	14	40	1615	104	38	14	40	1615	104	38
55	14	50	2012	118	32	14	50	2012	118	32
65	14	50	2012	126	32	16	60	2517	134	45
75	16	60	2517	158	45	25	75	3020	158	51
90	25	75	3020	160	51	35	90	3535	180	89

i Parts W1, W2, T3 and T4 can be combined with each other as desired

Ordering example

Coupling size	Element version according to "General Technical Data"	Part	Bore diameter	Part	Bore diameter
MMA 42	N.	W1.	42.	T4.	38

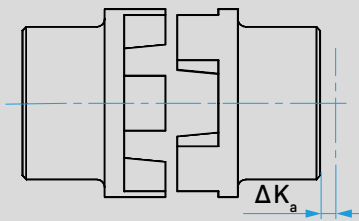
Coupling designation: MMA 42 N. W1. 42. T4. 38

MULTI MONT ASTRA

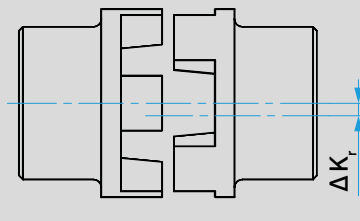
Permissible Displacement Values

The permissible displacement values as given in the “General Technical Data” table are dependent on the rotational speed and decrease when displacement occurs simultaneously.

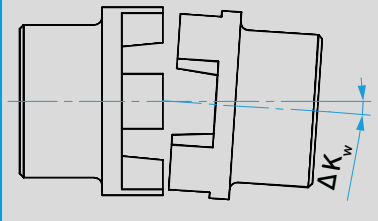
Axial displacement



Radial displacement



Angular displacement

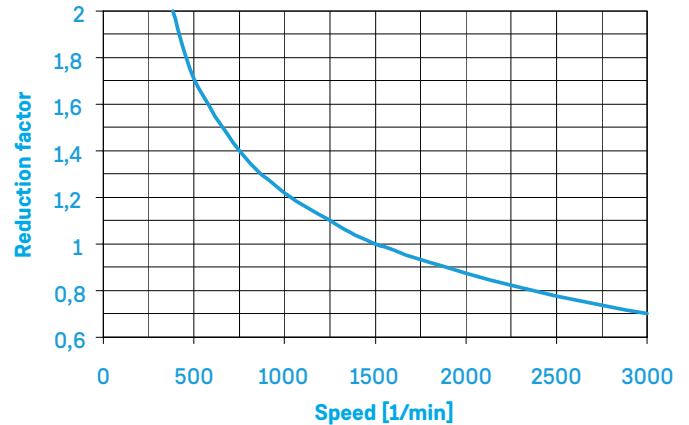


$$\text{Rule: } \frac{\Delta W_r}{\Delta K_r} + \frac{\Delta W_a}{\Delta K_a} + \frac{\Delta W_w}{\Delta K_w} \leq X$$

$\Delta K_{r/a/w}$ = permissible radial, axial or angular displacement of the shafts or coupling halves (see “General Technical Data” table).

$\Delta W_{r/a/w}$ = permissible radial, axial or angular displacement of the shaft or coupling halves.

Diagram



MULTI MONT ASTRA

Claw Coupling

Weights and moments of inertia

Coupling size	Weight [kg]				Moments of inertia [kgm ²]			
	Part W1	Part W2	Part T3	Part T4	Part W1	Part W2	Part T3	Part T4
19	0.16	0.21	-	-	0.00003	0.00005	-	-
24	0.32	0.40	0.39	0.39	0.00011	0.00015	0.00017	0.00017
28	0.52	0.76	0.55	0.55	0.00024	0.00049	0.00032	0.00032
38	1.10	1.40	0.86	0.86	0.00087	0.0013	0.00074	0.00074
42	1.70	2.30	1.40	1.40	0.0018	0.0031	0.0017	0.0017
48	2.80	3.10	2.50	2.50	0.0031	0.0052	0.0037	0.0037
55	3.70	4.60	2.70	2.70	0.0062	0.010	0.0054	0.0054
65	5.70	7.00	3.40	4.80	0.013	0.019	0.0082	0.012
75	8.80	11.00	6.80	7.30	0.027	0.041	0.023	0.026
90	15.00	18.00	9.50	16.00	0.068	0.090	0.044	0.081

i Weights and moments of inertia apply to medium bore diameters including taper bushes

Materials Overview

Part No.	Designation	Materials
W1, W2, T3, T4, taper bushes	-	Grey cast iron GG25
T5	Flexible element	Hytrel

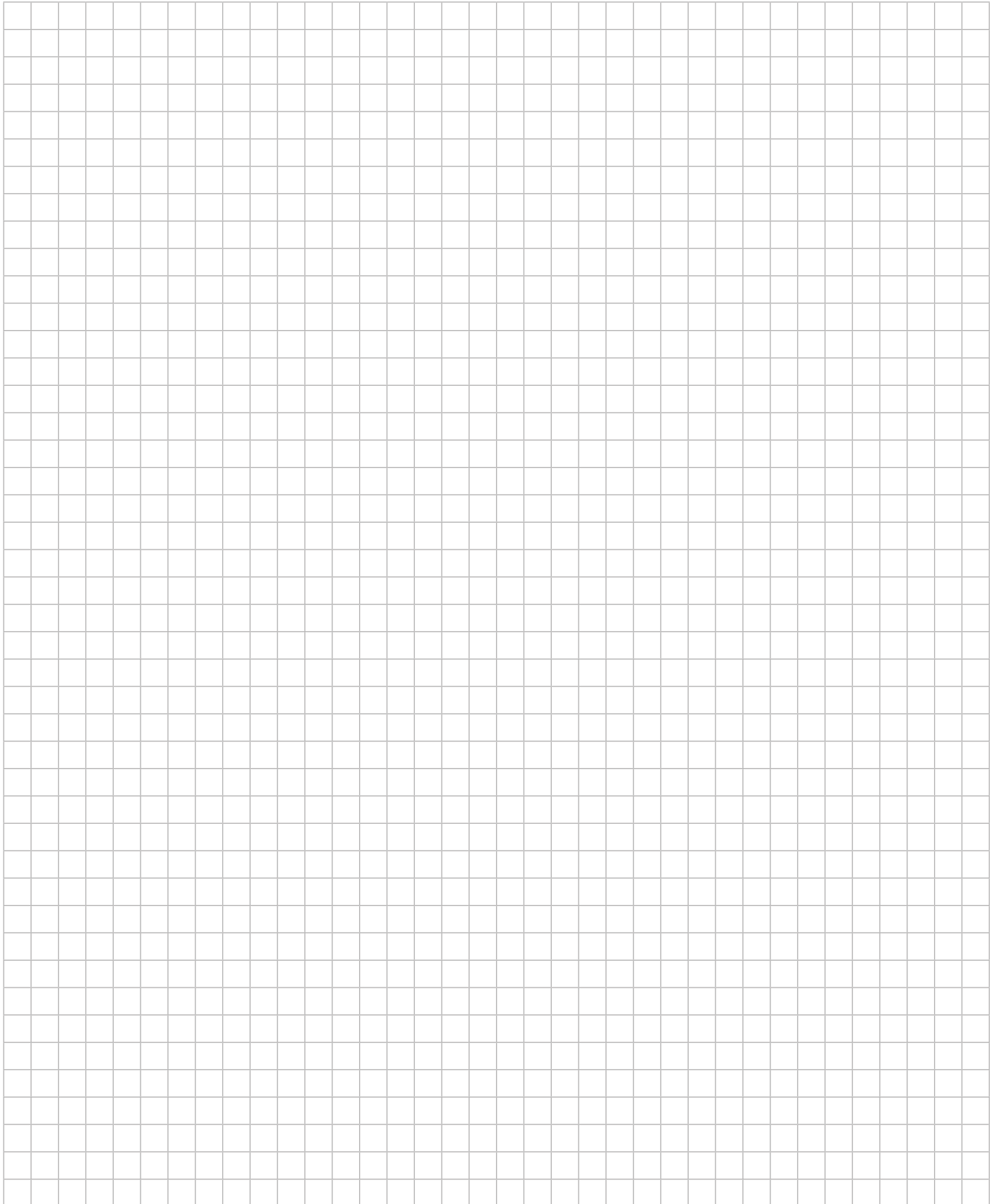
Available taper bushes

metric bores with keyway acc. to DIN 6885/1 - Tolerance zone JS9.

Taper bush	Length	Width across flats	Bolt tightening torque	Bore diameters of available tapered bushes																
				[mm]																
TB-No.	[mm]	[mm]	[Nm]	10	11	12	14	16	18	19	20	22	24	25	28	30	32	35	38	40
1008	22	3	5.6	10	11	12	14	16	18	19	20	22	-	-	-	-	-	-	-	-
1108	22	3	5.6	10	11	12	14	16	18	19	20	22	24	25	-	-	-	-	-	-
1610	25	5	20.0	14	16	18	19	20	22	24	25	28	30	32	35	38	40	-	-	-
1615	38	5	20.0	14	16	18	19	20	22	24	25	28	30	32	35	38	40	-	-	-
2012	32	5	31.0	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48
2517	45	6	48.0	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50
3020	51	8	90.0	25	28	30	32	35	38	40	42	45	48	50	55	60	65	70	75	-
3535	89	10	90.0	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90	-	-

MULTI MONT ASTRA

Notes





MULTI MONT ASTRA

SIMPLY **POWERFUL.**



Industrial solutions:

- ⚡ Power generation
- 🚚 Mobile applications
- 🧠 Test benches
- ⚙️ Pumps & compressors
- ⚙️ Industry
- ⚓ Ship & port engineering

Headquarter:

Dipl.-Ing. Herwarth Reich GmbH
Vierhausstrasse 53 · 44807 Bochum

- ☎ +49 234 95916-0
- ✉ mail@reich-kupplungen.com
- 🌐 www.reich-kupplungen.com

Copyright ISO 16016 to be observed:

The reproduction, distribution and utilisation of this document as well as the communication of its contents to others without explicit authorisation is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design. © REICH - Dipl.- Ing. Herwarth Reich GmbH

March 2020 edition

The present MULTI MONT ASTRA catalogue edition renders parts of the previous MULTI MONT ASTRA catalogues obsolete. All dimensions in millimetres. We reserve the right to change dimensions and/or design without prior notice. Texts and illustrations, dimensional and performance data have been compiled with the utmost care. There is no guarantee, however, that the information is accurate; in particular, there is no guarantee that products will match the illustrations in terms of technology, colour, shape and configuration or that the products will correspond to the proportions of the illustrations. We also reserve the right to make changes due to printing errors or mistakes.