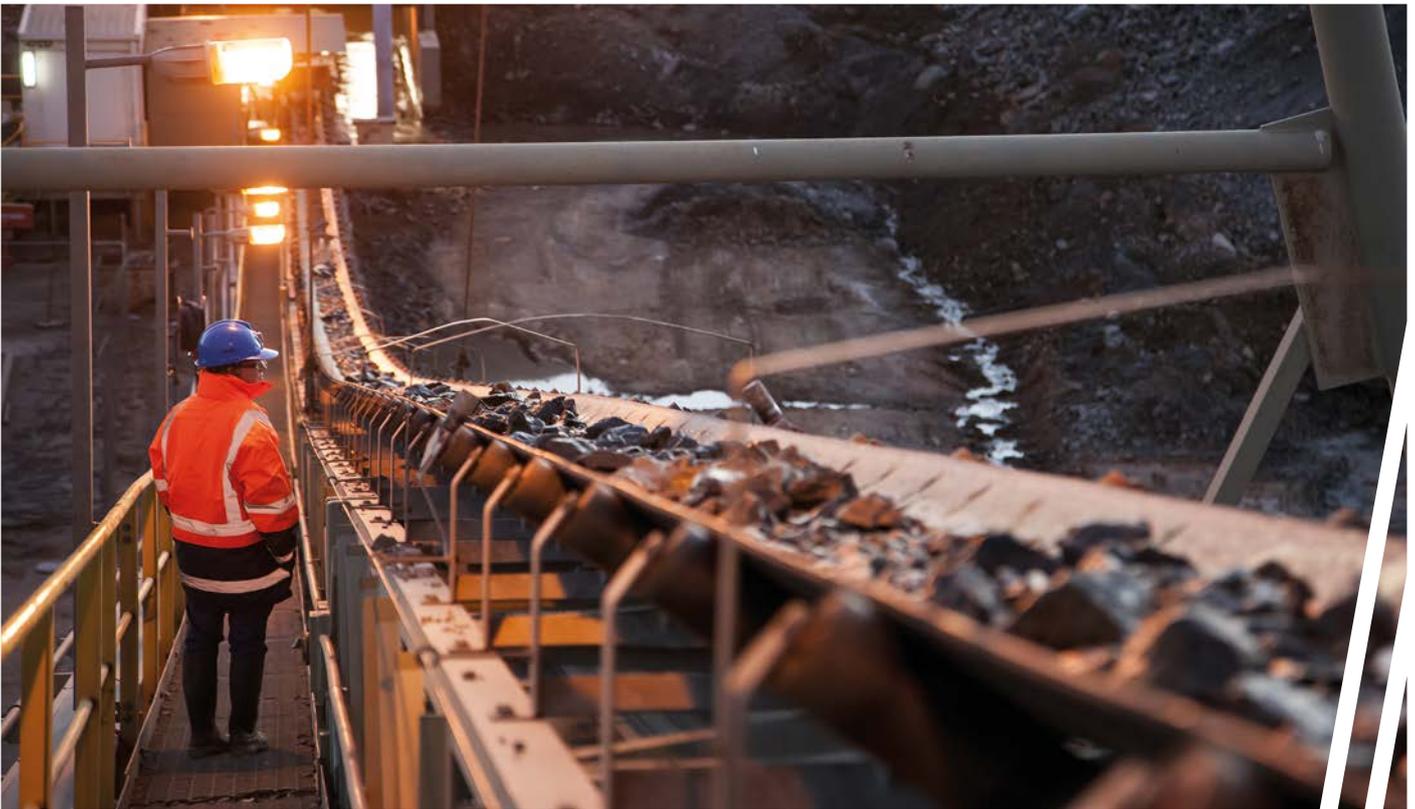


Cone Clamping Elements for Bending Moments



Version 2026/2027

Introduction						Page
Cone Clamping Elements for Bending Moments						3
Use of Cone Clamping Elements in Conveyor Pulleys						4
Cone Clamping Elements for Bending Moments	Shaft diameter	Axial width	Bending moment capacity	Max. transmissible torque up to [Nm]	Max. bending moment up to	Page
	[mm]					
RLK 133 TC	130 - 520	short	medium	567 500	185 000	6
RLK 136 TC	70 - 600	short	high	994 500	395 000	7
RLK 235 TC	70 - 600	long	very high	1 021 900	628 100	8
RLK 402 TC	130 - 600	long	highest	1 727 560	1 122 900	10
RLK 402	70 - 300	long	very high	417 260	417 260	11
RLK 404 TC	100 - 600	medium	very high	1 193 330	759 940	12
RLK 404	70 - 600	medium	high	1 193 330	441 530	13
Technology details						Page
Hub design						14
Torques and axial forces						15

Issue 03/2026 • Technical details subject to change without notice.



Cone Clamping Elements for Bending Moments

RINGSPANN Cone Clamping Elements

RINGSPANN Cone Clamping Elements are multi-part, ring-shaped Shaft-Hub-Connections. In the drive systems of machines and plants, they transmit torques between shafts and hubs without backlash, safely and permanently.

Torque is transmitted by pushing the rings of the Cone Clamping Elements over each other in the axial direction using clamping screws via conical sliding surfaces. This causes the outer ring to expand while the inner ring contracts. This creates a frictional connection between the shaft and hub. Torque is transmitted via static friction. Keyways are not required.

Further information on RINGSPANN Cone Clamping Elements, such as CAD models or a free calculation programme, can be found on our website at www.ringspann.com. We would also be happy to advise you personally on site, by telephone or by email.

Cone Clamping Elements for Bending Moments

Our series of Cone Clamping Elements for Bending Moments are self-centring, maintenance-free and also suitable for reversing drive systems. They have been specifically developed for applications in which, in addition to high axial and radial loads, additional bending moments must be reliably transmitted.

Our Cone Clamping Elements for Bending Moments have proven themselves worldwide, particularly in driven and deflecting conveyor pulleys, which are mainly used in conveyor systems in the mining, raw materials handling and coal industries. In addition to reliable and backlash-free torque transmission, they perform another key function: they are able to safely absorb the high bending moments that occur during operation.

Our series specially designed for conveyor pulleys are suitable for different pulley types and a wide range of installation situations. Depending on the series and size, they enable bending moments of up to 60% of the transmissible torque.

The design of the Cone Clamping Elements is based on the latest scientific findings and the results of joint research projects with leading universities.



Use of Cone Clamping Elements in Conveyor Pulleys

The use of Cone Clamping Elements in conveyor pulleys is one of the most technically demanding applications of Shaft-Hub-Connections. The Cone Clamping Elements mounted between the pulley shaft and the pulley end disks are exposed to exceptionally high loads here. In addition to simultaneous axial and transverse forces, considerable bending moments occur during operation, which must be absorbed safely and permanently.

In order to reliably withstand these complex stresses, our series of Cone Clamping Elements for bending moments have been specially developed for this application. This applies to the constructional design as well as the selection of the used materials and the surface treatment. Production takes place under strict quality management, which includes optimising concentricity and ensuring maximum precision.

The high-quality design of RINGSPANN Cone Clamping Elements minimises the risk of operational damage, costly repairs and expensive plant downtime. Typical problems such as deformation of the pulley hub, unwanted axial displacement or shaft failure can be effectively avoided. In addition, the Cone Clamping Elements enable easy installation and quick replacement. Their design complies with the current specifications and standards of conveyor pulley manufacturers.



4-1

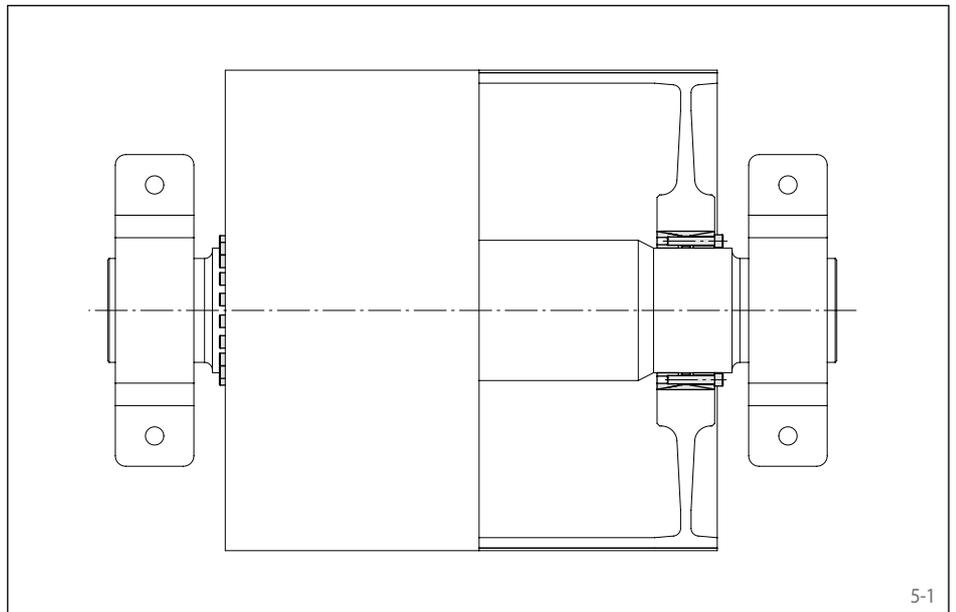


4-2

Use of Cone Clamping Elements in Conveyor Pulleys

Application example

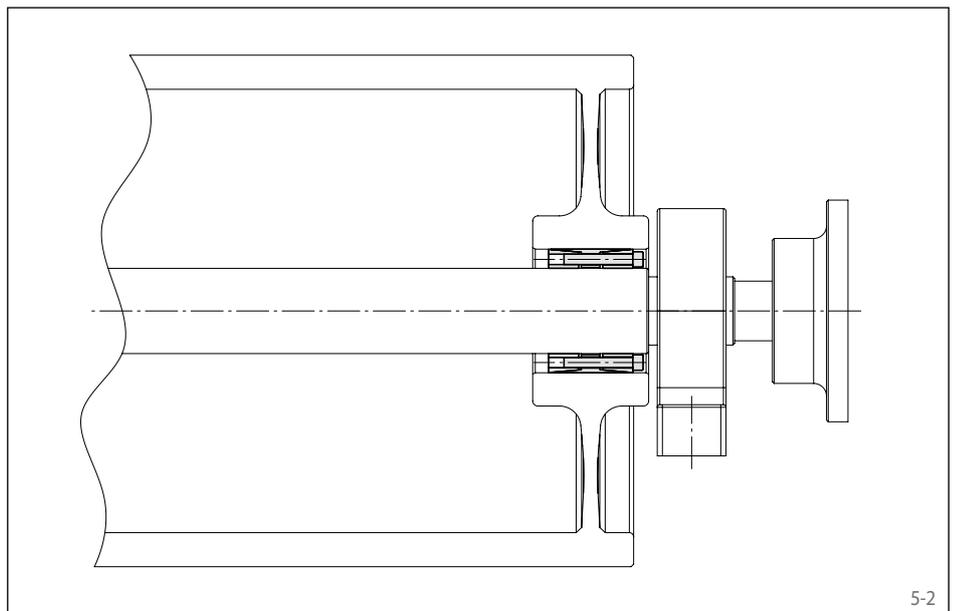
Backlash free attachment of a conveyor pulley to the shaft of a conveyor belt with an Cone Clamping Element RLK 404. The Cone Clamping Element centres the pulley drum on the drive shaft. As no axial shift occurs during the clamping process, the axial position of the pulley drum in relation to the drive shaft remains unchanged.



5-1

Application example

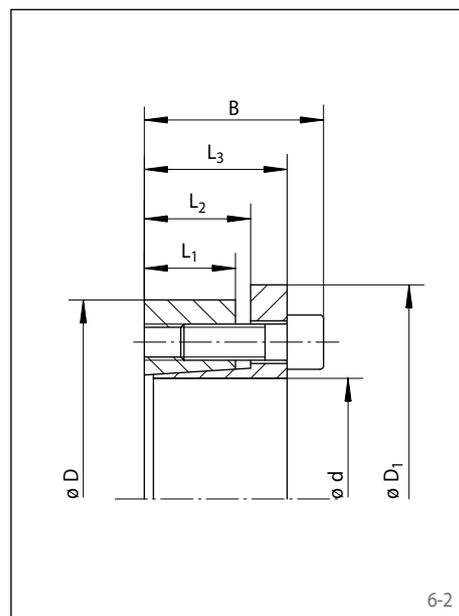
Backlash free attachment of a conveyor pulley to the drive shaft of a conveyor belt with a Cone Clamping Element RLK 402 TC. The Cone Clamping Element can be used to transmit all acting loads of a driven conveyor pulley. It centres the pulley drum on the drive shaft. As no axial shift occurs during the clamping process, the axial position of the pulley drum in relation to the drive shaft remains unchanged.



5-2

Cone Clamping Elements RLK 133 TC

for medium bending moments
premium quality for high centering accuracy



Dimensions							Technical Data										Weight		Article number	
Size		D ₁ mm	B mm	L ₁ mm	L ₂ mm	L ₃ mm	Transmissible torque or axial force		Bending moments		Contact pressure at		Pressure at M _b max		Tightening torque M _S Nm	Number	Size	Length mm	kg	
d mm	D mm						M Nm	F kN	M _b max	M _t res at M _b max	P _W N/mm ²	P _N N/mm ²	P _W N/mm ²	P _N N/mm ²						
130	180	189	64	34	40	52	19500	300	6800	18300	180	130	257	185	144	12	M12	30	5,1	4204-130301-TC0000
140	190	199	68	34	40	54	21700	311	7600	20400	173	128	252	186	229	9	M14	40	5,3	4204-140301-TC0000
150	200	209	68	34	40	54	25900	345	9100	24200	180	135	267	200	229	10	M14	40	5,6	4204-150301-TC0000
160	210	219	68	34	40	54	30400	380	10600	28500	185	141	282	215	229	11	M14	40	6,0	4204-160301-TC0000
170	225	234	78	44	50	64	35200	414	12300	33000	147	111	210	158	229	12	M14	40	8,2	4204-170301-TC0000
180	235	244	78	44	50	64	37300	414	13000	34900	139	106	202	154	229	12	M14	40	8,6	4204-180301-TC0000
190	250	259	78	44	50	64	49200	518	17200	46100	164	125	243	185	229	15	M14	40	10,0	4204-190301-TC0000
200	260	269	78	44	50	64	51800	518	18100	48500	156	120	235	181	229	15	M14	40	10,4	4204-200301-TC0000
220	285	294	88	50	56	72	62100	564	21700	58200	136	105	202	156	354	12	M16	40	13,9	4204-220301-TC0000
240	305	314	88	50	56	72	84700	706	29600	79300	156	123	239	188	354	15	M16	40	14,8	4204-240301-TC0000
260	325	334	88	50	56	72	110100	847	37800	103400	173	138	270	216	354	18	M16	40	16,1	4204-260301-TC0000
280	355	364	102	60	66	84	128900	920	45100	120700	145	115	220	174	492	16	M18	50	23,6	4204-280301-TC0000
300	375	384	102	60	66	84	155300	1035	54400	145500	153	122	237	190	492	18	M18	50	25,7	4204-300301-TC0000
320	405	414	121	74	81	101	210500	1316	73700	197200	147	116	218	172	692	18	M20	50	36,1	4204-320301-TC0000
340	425	434	121	74	81	101	260900	1535	91300	244400	162	129	244	195	692	21	M20	50	38,3	4204-340301-TC0000
360	455	464	138	86	94	116	297100	1651	104000	278300	141	112	207	164	945	18	M22	60	52,5	4204-360301-TC0000
380	475	484	138	86	94	116	365900	1926	128100	342700	156	125	233	186	945	21	M22	60	55,0	4204-380301-TC0000
400	495	504	138	86	94	116	385100	1926	134800	360800	148	120	225	182	945	21	M22	60	60,3	4204-400301-TC0000
420	515	524	138	86	94	116	423700	2017	148300	396800	148	121	228	186	945	22	M22	60	62,9	4204-420301-TC0000
440	535	544	138	86	94	116	443800	2017	155300	415800	141	116	222	182	945	22	M22	60	65,6	4204-440301-TC0000
460	555	564	138	86	94	116	464000	2017	152000	438400	135	112	210	174	945	22	M22	60	68,3	4204-460301-TC0000
480	575	584	138	86	94	116	528200	2201	174000	498700	141	118	224	187	945	24	M22	60	71,0	4204-480301-TC0000
500	595	604	138	86	94	116	550200	2201	181000	519600	136	114	218	183	945	24	M22	60	73,7	4204-500301-TC0000
520	615	624	138	86	94	116	572200	2201	185000	541500	131	110	211	179	945	24	M22	60	75,9	4204-520301-TC0000

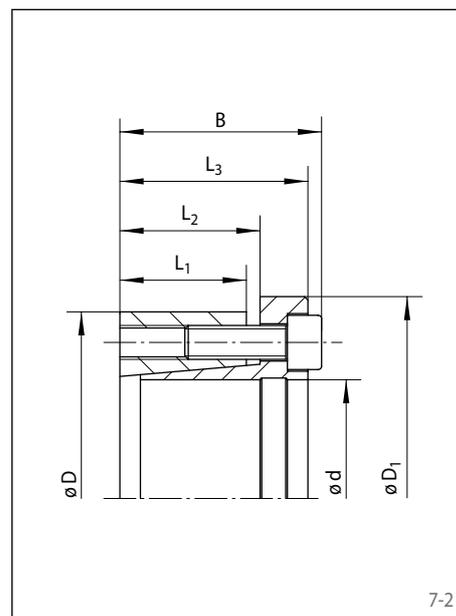
The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Cone Clamping Elements RLK 136 TC

for high bending moments
premium quality for high centering accuracy



7-1



7-2

Dimensions							Technical Data										Weight		Article number	
Size		D ₁ mm	B mm	L ₁ mm	L ₂ mm	L ₃ mm	Transmissible torque or axial force		Bending moments		Contact pressure at		Pressure at M _b max		Tightening torque M _S Nm	Number	Size	Length mm		kg
d mm	D mm						M Nm	F kN	M _b max	M _t res at M _b max	P _W N/mm ²	P _N N/mm ²	P _W N/mm ²	P _N N/mm ²						
70	110	119	61	37	43	57	6800	195	3100	6100	200	127	254	162	83	12	M10	30	2,5	4204-070601-TC0000
75	115	124	61	37	43	57	7300	195	3300	6500	187	122	241	157	83	12	M10	30	2,6	4204-075601-TC0000
90	130	139	61	37	43	57	10300	228	4600	9200	181	126	244	169	83	14	M10	30	3,0	4204-090601-TC0000
100	150	159	69	40	46	64	16500	331	7400	14700	219	146	297	198	144	14	M12	40	4,7	4204-100601-TC0000
110	160	169	69	40	46	64	18200	331	8200	16200	199	137	277	191	144	14	M12	40	5,1	4204-110601-TC0000
120	170	179	69	40	46	64	22700	378	10200	20300	209	147	298	210	144	16	M12	40	5,4	4204-120601-TC0000
130	185	194	82	48	55	75	33800	521	15200	30200	221	156	307	216	229	16	M14	40	7,5	4204-130601-TC0000
140	195	204	82	48	55	75	36400	521	16400	32500	206	148	291	209	229	16	M14	40	8,8	4204-140601-TC0000
150	205	214	82	48	55	75	43900	586	19500	39300	216	158	311	227	229	18	M14	40	8,6	4204-150601-TC0000
160	215	224	82	48	55	75	46900	586	21100	41900	202	151	298	222	229	18	M14	40	8,9	4204-160601-TC0000
170	230	239	99	64	71	93	67900	798	30500	60700	195	144	268	198	354	18	M16	50	12,7	4204-170601-TC0000
180	240	249	99	64	71	93	71800	798	32300	64100	184	138	257	193	354	18	M16	50	13,3	4204-180601-TC0000
190	250	259	99	64	71	93	84300	887	37900	75300	193	147	275	209	354	20	M16	50	13,9	4204-190601-TC0000
200	260	269	99	64	71	93	88700	887	39900	79200	184	141	266	204	354	20	M16	50	14,6	4204-200601-TC0000
220	285	294	102	66	74	96	97600	887	43900	87200	162	125	239	184	354	20	M16	50	17,8	4204-220601-TC0000
240	305	314	102	66	74	96	127700	1064	57500	114000	178	140	271	213	354	24	M16	50	19,2	4204-240601-TC0000
260	325	334	102	66	74	96	149900	1153	67500	133800	178	143	278	223	354	26	M16	50	19,5	4204-260601-TC0000
280	355	364	120	77	87	112	182200	1302	82000	162700	160	126	243	192	492	24	M18	60	19,7	4204-280601-TC0000
300	375	384	120	77	87	112	211500	1410	95200	188900	162	130	252	201	492	26	M18	60	30,6	4204-300601-TC0000
320	405	414	130	84	94	122	264600	1654	119100	236300	163	129	252	199	692	24	M20	60	42,7	4204-320601-TC0000
340	425	434	130	84	94	122	328000	1930	147600	292900	179	143	283	226	692	28	M20	60	44,9	4204-340601-TC0000
360	445	454	141	91	101	133	372100	2067	167500	332300	167	135	262	212	692	30	M20	60	52,4	4204-360601-TC0000
380	465	474	141	91	101	133	419000	2205	188600	374200	169	138	270	221	692	32	M20	60	54,0	4204-380601-TC0000
400	485	494	141	90	101	133	468600	2343	189800	428400	173	142	271	224	692	34	M20	60	56,2	4204-400601-TC0000
420	505	514	141	90	101	133	492100	2343	221400	439500	164	137	274	228	692	34	M20	60	59,2	4204-420601-TC0000
440	525	534	155	103	115	147	545800	2481	245600	487400	145	122	234	196	692	36	M20	60	70,6	4204-440601-TC0000
460	545	554	155	103	115	147	602300	2619	271000	537900	147	124	240	203	692	38	M20	60	71,2	4204-460601-TC0000
480	565	574	155	103	115	147	628500	2619	282800	561300	141	119	234	199	692	38	M20	60	75,1	4204-480601-TC0000
500	585	594	160	107	120	152	689200	2757	310100	615500	137	117	228	195	692	40	M20	60	79,9	4204-500601-TC0000
520	605	614	160	107	120	152	716700	2757	322500	640000	131	113	222	191	692	40	M20	60	80,5	4204-520601-TC0000
540	625	634	160	107	120	152	781500	2894	340000	703700	133	115	225	195	692	42	M20	60	82,8	4204-540601-TC0000
560	645	654	160	107	120	152	849000	3032	360000	768900	134	117	229	198	692	44	M20	60	85,7	4204-560601-TC0000
580	665	674	160	107	120	152	919300	3170	379000	837500	135	118	231	202	692	46	M20	60	89,0	4204-580601-TC0000
600	685	694	160	107	120	152	992400	3308	395000	910400	137	120	233	204	692	48	M20	60	91,3	4204-600601-TC0000

The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Cone Clamping Elements RLK 235 TC

for very high bending moments
premium quality for high centering accuracy

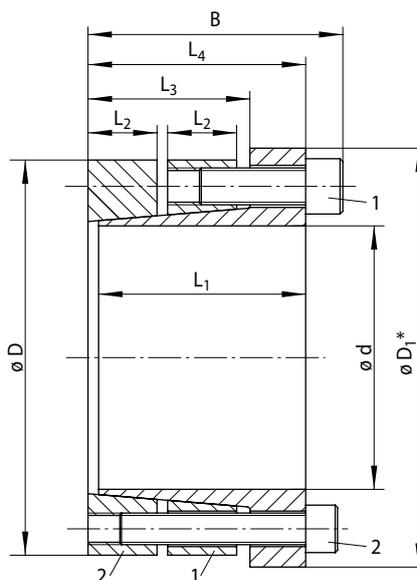


8-1

Dimensions							Technical Data						Bending moments	
Size		B mm	L ₁ mm	L ₂ mm	L ₃ mm	L ₄ mm	Transmissible torque or axial force						M _b max	M _t res at M _b max
d mm	D mm						M ₁ Nm	M ₂ Nm	ΣM Nm	F ₁ kN	F ₂ kN	ΣF Nm		
70	115	88	70	24	58	76	5000	3430	8430	145	98	243	5500	6390
80	125	88	70	24	58	76	6670	4580	11250	169	114	283	7300	8560
90	135	88	70	24	58	76	7500	5150	12650	169	114	283	8200	9630
100	150	96	78	26	61	82	11440	8340	19780	231	169	400	12900	14990
110	160	96	78	26	61	82	12580	9170	21750	231	169	400	14100	16560
120	170	96	78	26	61	82	13730	10010	23740	231	169	400	15400	18070
130	190	111	90	30	71	95	23270	17080	40350	361	264	625	26200	30690
140	200	111	90	30	71	95	25060	18390	43450	361	264	625	28200	33060
150	210	111	90	30	71	95	26850	19700	46550	361	264	625	30300	35340
160	220	111	90	30	71	95	28640	21020	49660	361	264	625	32300	37720
170	240	142	114	40	92	122	47290	30430	77720	561	361	922	50500	59080
180	250	142	114	40	92	122	50070	32220	82290	561	361	922	53500	62530
190	260	142	114	40	92	122	52850	34010	86860	561	361	922	56500	65970
200	270	142	114	40	92	122	69540	44750	114290	702	451	1153	74300	86840
220	290	142	114	40	92	122	76500	49230	125730	702	451	1153	81700	95570
240	310	142	114	40	92	122	100140	64440	164580	842	542	1384	107000	125050
260	330	142	114	40	92	122	108490	69810	178300	842	542	1384	115900	135490
280	365	168	135	45	108	144	141080	97360	238440	1022	702	1724	155000	181190
300	385	168	135	45	108	144	151160	104310	255470	1022	702	1724	166100	194100
320	405	168	135	45	108	144	193480	133520	327000	1226	842	2068	212600	248460
340	425	168	135	45	108	144	239840	165510	405350	1431	983	2414	263500	308020
360	445	168	135	45	108	144	253950	175250	429200	1431	983	2414	279000	326150
380	465	168	135	45	108	144	306350	211410	517760	1635	1123	2758	301900	420630
400	485	168	135	45	108	144	322470	222540	545010	1635	1123	2758	331400	432680
420	505	168	135	45	108	144	338600	233660	572260	1659	1140	2799	360200	444680
440	525	202	167	59	147	178	354720	244790	599510	1659	1140	2799	389700	455570
460	545	202	167	59	147	178	370840	255920	626760	1659	1140	2799	407400	476290
480	565	202	167	59	147	178	386970	267040	654010	1866	1140	2799	425100	497010
500	585	202	167	59	147	178	453480	312940	766420	1866	1282	3148	498200	582410
520	605	202	167	59	147	178	471620	325460	797080	1866	1282	3148	518100	605730
540	625	202	167	59	147	178	489750	337980	827730	1866	1282	3148	538000	629040
560	645	202	167	59	147	178	507890	350500	858390	1866	1282	3148	558000	652280
580	665	202	167	59	147	178	584480	403350	987830	2073	1425	3498	633200	758200
600	685	202	167	59	147	178	604640	417260	1021900	2073	1425	3498	628100	806080

The technical data provided are based on theoretical calculations and the specified screw tightening torques.

for very high bending moments
premium quality for high centering accuracy



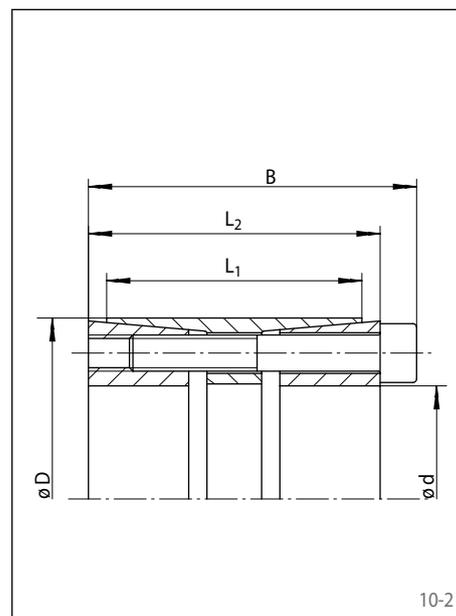
9-1

Dimensions		Contact pressure at				Max. pressure at M_b max		Technical Data Clamping screws 1			Clamping screws 2			Weight	Article number
Size		Shaft		Hub		Shaft	Hub	Tightening torque M_S Nm	Number	Size	Tightening torque M_S Nm	Number	Size	kg	
d mm	D mm	P_{W1} N/mm ²	P_{W2} N/mm ²	P_{N1} N/mm ²	P_{N2} N/mm ²	P_W N/mm ²	P_N N/mm ²								
70	115	226	155	137	94	265	161	145	6	M12	83	6	M10	3,62	4204-070501-TC0000
80	125	230	158	147	101	276	177	145	7	M12	83	7	M10	4,02	4204-080501-TC0000
90	135	205	141	137	94	250	167	145	7	M12	83	7	M10	4,44	4204-090501-TC0000
100	150	233	170	156	113	291	194	230	7	M14	145	7	M12	6,02	4204-100501-TC0000
110	160	212	155	146	106	270	186	230	7	M14	145	7	M12	6,46	4204-110501-TC0000
120	170	194	142	137	100	253	178	230	7	M14	145	7	M12	6,88	4204-120501-TC0000
130	190	244	179	167	122	311	213	355	8	M16	230	8	M14	10,56	4204-130501-TC0000
140	200	226	166	158	116	293	205	355	8	M16	230	8	M14	11,22	4204-140501-TC0000
150	210	211	155	151	111	278	199	355	8	M16	230	8	M14	11,92	4204-150501-TC0000
160	220	198	145	144	106	265	193	355	8	M16	230	8	M14	12,46	4204-160501-TC0000
170	240	217	140	154	99	276	196	690	8	M20	355	8	M16	20,58	4204-170501-TC0000
180	250	205	132	148	95	264	190	690	8	M20	355	8	M16	21,52	4204-180501-TC0000
190	260	194	125	142	91	253	185	690	8	M20	355	8	M16	22,58	4204-190501-TC0000
200	270	231	148	171	110	304	225	690	10	M20	355	10	M16	23,38	4204-200501-TC0000
220	290	210	135	159	102	283	215	690	10	M20	355	10	M16	25,64	4204-220501-TC0000
240	310	231	148	179	115	319	247	690	12	M20	355	12	M16	27,90	4204-240501-TC0000
260	330	213	137	168	108	301	237	690	12	M20	355	12	M16	29,85	4204-260501-TC0000
280	365	212	146	163	112	292	224	1200	10	M24	690	10	M20	45,80	4204-280501-TC0000
300	385	198	137	154	106	278	216	1200	10	M24	690	10	M20	48,40	4204-300501-TC0000
320	405	223	154	176	121	318	252	1200	12	M24	690	12	M20	51,40	4204-320501-TC0000
340	425	245	169	196	135	356	285	1200	14	M24	690	14	M20	54,25	4204-340501-TC0000
360	445	231	159	187	129	343	277	1200	14	M24	690	14	M20	57,25	4204-360501-TC0000
380	465	250	173	204	141	365	298	1200	16	M24	690	16	M20	59,00	4204-380501-TC0000
400	485	238	164	196	135	357	294	1200	16	M24	690	16	M20	62,90	4204-400501-TC0000
420	505	226	156	188	130	350	291	1200	16	M24	690	16	M20	65,35	4204-420501-TC0000
440	525	165	114	138	95	234	196	1200	16	M24	690	16	M20	82,70	4204-440501-TC0000
460	545	158	109	133	92	226	191	1200	16	M24	690	16	M20	85,70	4204-460501-TC0000
480	565	151	104	128	89	220	187	1200	16	M24	690	16	M20	91,00	4204-480501-TC0000
500	585	163	113	139	96	241	206	1200	18	M24	690	18	M20	94,00	4204-500501-TC0000
520	605	157	108	135	93	234	201	1200	18	M24	690	18	M20	98,00	4204-520501-TC0000
540	625	151	104	130	90	228	197	1200	18	M24	690	18	M20	101,00	4204-540501-TC0000
560	645	146	100	126	87	223	194	1200	18	M24	690	18	M20	104,00	4204-560501-TC0000
580	665	156	108	136	94	241	210	1200	20	M24	690	20	M20	108,00	4204-580501-TC0000
600	685	151	104	132	91	232	204	1200	20	M24	690	20	M20	111,00	4204-600501-TC0000

The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Cone Clamping Elements RLK 402 TC

for highest bending moments
premium quality for high centering accuracy

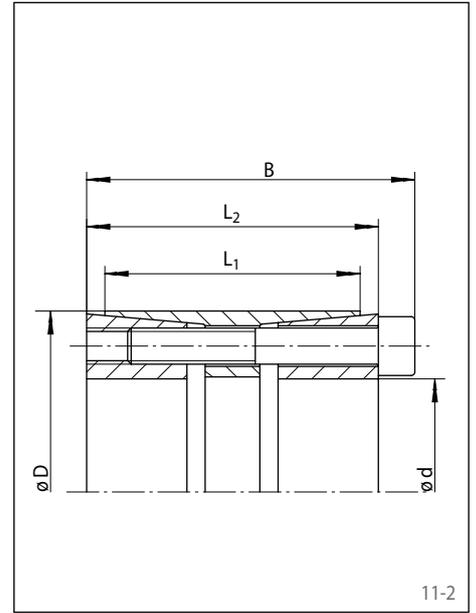
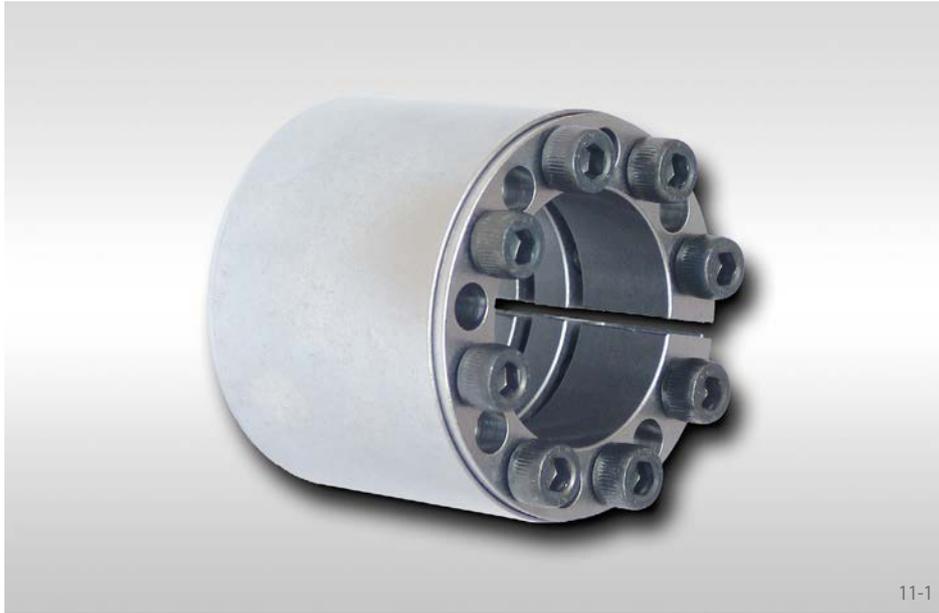


Dimensions					Technical Data										Article number			
Size					Transmissible torque or axial force		Bending moments		Contact pressure at		Pressure at M_b max		Clamping screws				Weight	Article number
d	D	B	L1	L2	M	F	M_b max	M_{res} at M_b max	Shaft	Hub	Shaft	Hub	Tightening torque	Number	Size	Length	kg	
mm	mm	mm	mm	mm	Nm	kN	Nmm	Nmm	P_W N/mm ²	P_N N/mm ²	P_W N/mm ²	P_N N/mm ²	M_5 Nm		mm	mm		
130	180	130	104	116	50980	784	33140	38740	170	123	206	149	229	12	M14	90	9,7	4205-130201-TC0000
140	190	130	104	116	64050	915	41630	48670	184	136	226	167	229	14	M14	90	10,2	4205-140201-TC0000
150	200	130	104	116	78430	1046	50980	59600	197	148	245	183	229	15	M14	90	10,2	4205-150201-TC0000
160	210	130	104	116	83660	1046	54380	63570	184	141	232	177	229	16	M14	90	11,4	4205-160201-TC0000
170	225	162	134	146	106510	1253	69230	80940	166	125	202	152	354	14	M16	110	17,1	4205-170201-TC0000
180	235	162	134	146	128890	1432	83780	97940	179	137	220	169	354	15	M16	110	18,0	4205-180201-TC0000
190	250	162	134	146	136050	1432	88430	103390	167	127	208	158	354	16	M16	110	20,8	4205-190201-TC0000
200	260	162	134	146	143210	1432	93080	108830	158	122	200	153	354	16	M16	110	21,9	4205-200201-TC0000
220	285	162	134	146	196910	1790	127990	149640	180	139	231	179	354	18	M16	110	25,5	4205-220201-TC0000
240	305	162	134	146	236290	1969	153600	179570	181	143	238	187	354	20	M16	110	27,9	4205-240201-TC0000
260	325	162	134	146	255980	1969	166400	194530	167	134	224	179	354	20	M16	110	30,3	4205-260201-TC0000
280	355	197	165	177	350500	2504	227800	266350	164	129	213	168	692	18	M20	140	45,6	4205-280201-TC0000
300	375	197	165	177	417260	2782	271200	317090	170	136	224	179	692	20	M20	140	50,7	4205-300201-TC0000
320	405	197	165	177	467330	2921	256800	390430	167	132	215	170	692	21	M20	140	66,5	4205-320201-TC0000
340	425	197	165	177	520180	3060	320700	409580	165	132	221	177	692	22	M20	140	63,8	4205-340201-TC0000
360	455	224	190	202	659610	3665	428700	501260	161	128	216	171	945	21	M22	160	79,8	4205-360201-TC0000
380	475	224	190	202	729410	3839	474100	554310	160	128	217	174	945	22	M22	160	79,8	4205-380201-TC0000
400	495	224	190	202	837600	4188	412300	729110	166	134	213	172	945	24	M22	160	91,0	4205-400201-TC0000
420	515	224	190	202	879480	4188	571700	668350	158	129	220	179	945	24	M22	160	92,1	4205-420201-TC0000
440	535	224	190	202	921360	4188	598900	700180	151	124	213	175	945	24	M22	160	96,6	4205-440201-TC0000
460	555	224	190	202	963240	4188	626100	732000	144	120	206	171	945	24	M22	160	103,2	4205-460201-TC0000
480	575	224	190	202	1172650	4886	612400	1000040	161	135	219	183	945	28	M22	160	108,4	4205-480201-TC0000
500	595	224	190	202	1221510	4886	794000	928260	155	130	227	191	945	28	M22	160	112,5	4205-500201-TC0000
520	615	224	190	202	1361110	5235	708100	1162440	160	135	222	187	945	30	M22	160	117,3	4205-520201-TC0000
540	635	224	190	202	1413460	5235	918700	1074130	154	131	231	197	945	30	M22	160	121,1	4205-540201-TC0000
560	655	224	190	202	1563530	5584	802200	1342020	158	135	223	191	945	32	M22	160	125,6	4205-560201-TC0000
580	675	224	190	202	1669970	5759	848900	1438090	158	135	224	192	945	33	M22	160	134,1	4205-580201-TC0000
600	695	224	190	202	1727560	5759	1122900	1312830	152	131	237	205	945	33	M22	160	132,9	4205-600201-TC0000

The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Cone Clamping Elements RLK 402

for very high bending moments



Dimensions					Technical Data										Article number			
Size					Transmissible torque or axial force		Bending moments		Contact pressure at		Pressure at M_b max		Clamping screws			Weight		
d mm	D mm	B mm	L1 mm	L2 mm	M Nm	F kN	M_b max	M_t res at M_b max	Shaft P_W N/mm ²	Hub P_N N/mm ²	Shaft P_W N/mm ²	Hub P_N N/mm ²	Tightening torque M_S Nm	Number			Size	Length mm
70	110	86	70	76	11450	327	5150	10220	207	131	227	145	83	10	M10	60	2,9	4205-070201-000000
75	115	86	70	76	12270	327	5520	10950	193	126	214	139	83	10	M10	60	3,1	4205-075201-000000
80	120	86	70	76	15700	393	7070	14020	217	145	246	164	83	12	M10	60	3,3	4205-080201-000000
85	125	86	70	76	16680	393	7510	14900	204	139	234	159	83	12	M10	60	3,4	4205-085201-000000
90	130	86	70	76	17660	393	7950	15770	193	133	222	154	83	12	M10	60	3,5	4205-090201-000000
95	135	86	70	76	18650	393	8390	16650	183	129	212	149	83	12	M10	60	3,7	4205-095201-000000
100	145	110	92	98	28590	572	10290	26670	190	131	210	145	144	12	M12	80	5,6	4205-100201-000000
110	155	110	92	98	31450	572	11320	29340	172	122	192	136	144	12	M12	80	6,1	4205-110201-000000
120	165	110	92	98	40030	667	14410	37340	184	134	208	151	144	14	M12	80	6,6	4205-120201-000000
130	180	128	108	114	50980	784	18350	47560	170	123	190	137	229	12	M14	90	9,5	4205-130201-000000
140	190	128	108	114	64050	915	23060	59760	184	136	208	153	229	14	M14	90	10,0	4205-140201-000000
150	200	128	108	114	78430	1046	28230	73170	197	148	223	167	229	16	M14	90	10,6	4205-150201-000000
160	210	128	108	114	83660	1046	30120	78050	184	141	211	161	229	16	M14	90	11,2	4205-160201-000000
170	225	162	136	146	106510	1253	38340	99370	166	125	186	140	354	14	M16	110	16,8	4205-170201-000000
180	235	162	136	146	128890	1432	46400	120240	179	137	202	154	354	16	M16	110	17,6	4205-180201-000000
190	250	162	136	146	136050	1432	48980	126920	167	127	189	144	354	16	M16	110	20,3	4205-190201-000000
200	260	162	136	146	143210	1432	51550	133600	158	122	181	139	354	16	M16	110	21,3	4205-200201-000000
220	285	162	136	146	196910	1790	70890	183710	180	139	208	161	354	20	M16	110	24,9	4205-220201-000000
240	305	162	136	146	236290	1969	85100	220450	181	143	213	167	354	22	M16	110	26,9	4205-240201-000000
260	325	162	136	146	255980	1969	92200	238820	167	134	199	159	354	22	M16	110	28,7	4205-260201-000000
280	355	197	165	177	350500	2504	126200	327000	164	129	191	150	692	18	M20	130	43,4	4205-280201-000000
300	375	197	165	177	417260	2782	150200	389280	170	136	200	160	692	20	M20	130	46,0	4205-300201-000000

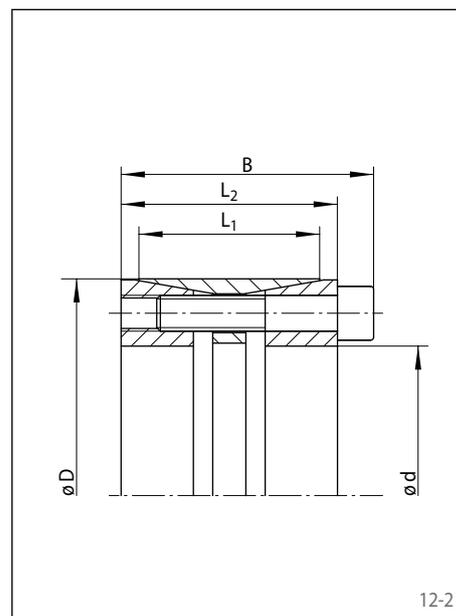
The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Cone Clamping Elements RLK 404 TC

for very high bending moments
premium quality for high centering accuracy



12-1



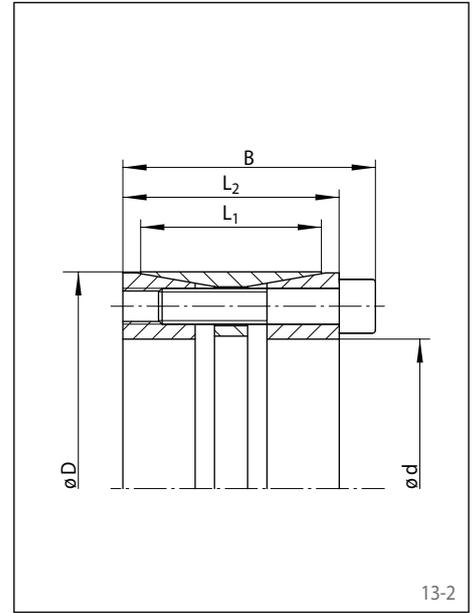
12-2

Dimensions					Technical Data										Article number			
Size		B mm	L1 mm	L2 mm	Transmissible torque or axial force		Bending moments		Contact pressure at		Pressure at M_b max		Clamping screws		Weight kg			
d mm	D mm				M Nm	F kN	M_b max	$M_{b, res}$ at M_b max	Shaft P_W N/mm ²	Hub P_N N/mm ²	Shaft P_W N/mm ²	Hub P_N N/mm ²	Tightening torque M_S Nm	Number			Size	Length mm
100	145	82	60	70	18370	367	11940	13960	199	137	253	175	144	10	M12	60	4,1	4205-100401-TC0000
110	155	82	60	70	20210	367	13140	15360	181	128	235	167	144	10	M12	60	4,5	4205-110401-TC0000
120	165	82	60	70	24250	404	15770	18430	182	133	242	176	144	11	M12	60	5,0	4205-120401-TC0000
130	180	91	65	79	33440	514	21740	25410	198	143	263	190	144	14	M12	65	6,6	4205-130401-TC0000
140	190	91	65	79	38590	551	25080	29320	197	145	267	196	144	15	M12	65	7,1	4205-140401-TC0000
150	200	91	65	79	41340	551	26870	31420	184	138	253	190	144	15	M12	65	7,5	4205-150401-TC0000
160	210	91	65	79	47040	588	30570	35750	184	140	258	197	144	16	M12	65	7,8	4205-160401-TC0000
170	225	106	78	92	64270	756	41770	48840	187	141	253	192	229	15	M14	75	10,8	4205-170401-TC0000
180	235	106	78	92	68050	756	44230	51710	177	135	243	186	229	15	M14	75	11,3	4205-180401-TC0000
190	250	116	88	102	76620	806	49800	58220	154	117	210	159	229	16	M14	80	14,8	4205-190401-TC0000
200	260	116	88	102	90730	907	58970	68950	165	127	227	175	229	18	M14	80	15,7	4205-200401-TC0000
220	285	124	96	108	113900	1035	74030	86550	154	119	214	165	354	15	M16	90	19,9	4205-220401-TC0000
240	305	124	96	108	165670	1381	51340	157510	188	148	226	178	354	20	M16	90	21,5	4205-240401-TC0000
260	325	124	96	108	188450	1450	88820	166200	183	146	243	195	354	21	M16	90	22,8	4205-260401-TC0000
280	355	130	96	110	225260	1609	114000	194280	198	156	270	213	692	15	M20	90	29,0	4205-280401-TC0000
300	375	130	96	110	257440	1716	126000	224500	197	158	272	217	692	15	M20	90	31,2	4205-300401-TC0000
320	405	156	124	136	343250	2145	195160	282370	173	136	238	188	692	20	M20	110	45,9	4205-320401-TC0000
340	425	156	124	136	364700	2145	237060	277150	162	130	237	189	692	20	M20	110	48,3	4205-340401-TC0000
360	455	177	140	155	477330	2652	310270	362740	164	130	236	187	945	20	M22	130	67,9	4205-360401-TC0000
380	475	177	140	155	503850	2652	327500	382890	156	124	228	182	945	20	M22	130	71,4	4205-380401-TC0000
400	495	177	140	155	583410	2917	379220	443350	163	131	242	195	945	22	M22	130	74,5	4205-400401-TC0000
420	515	177	140	155	668270	3182	283650	605080	169	138	225	184	945	24	M22	130	77,8	4205-420401-TC0000
440	535	177	140	155	700090	3182	416560	562680	161	133	240	198	945	24	M22	130	81,4	4205-440401-TC0000
460	555	177	140	155	731910	3182	475740	556200	154	128	241	200	945	24	M22	130	84,1	4205-460401-TC0000
480	575	177	140	155	795560	3315	517110	604570	154	129	244	204	945	25	M22	130	88,0	4205-480401-TC0000
500	595	177	140	155	828700	3315	538660	629760	148	124	238	200	945	25	M22	130	91,6	4205-500401-TC0000
520	615	177	140	155	965270	3713	488260	832680	159	135	238	201	945	28	M22	130	94,1	4205-520401-TC0000
540	635	177	140	155	1002400	3713	589000	811100	153	130	245	208	945	28	M22	130	97,5	4205-540401-TC0000
560	655	177	140	155	1113780	3978	558130	963850	158	135	242	207	945	30	M22	130	100,7	4205-560401-TC0000
580	675	177	140	155	1153560	3978	668750	939930	153	131	249	214	945	30	M22	130	104,2	4205-580401-TC0000
600	695	177	140	155	1193330	3978	759940	920080	148	128	254	219	945	30	M22	130	107,6	4205-600401-TC0000

The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Cone Clamping Elements RLK 404

for high bending moments



13-1

13-2

Dimensions					Technical Data										Article number			
Size					Transmissible torque or axial force		Bending moments		Contact pressure at		Pressure at M_b max		Clamping screws		Weight	Article number		
d	D	B	L1	L2	M	F	M_b max	M_t res at M_b max	Shaft	Hub	Shaft	Hub	Tightening torque	Number	Size		Length	kg
mm	mm	mm	mm	mm	Nm	kN			P_W	P_N	P_W	P_N	M_5		mm		mm	
70	110	70	50	60	7060	202	2830	6470	187	119	204	130	83	8	M10	50	2,5	4205-070401-000000
80	120	70	50	60	10090	252	4040	9250	204	136	237	158	83	10	M10	50	2,6	4205-080401-000000
90	130	70	50	60	12490	278	5000	11450	199	138	236	163	83	11	M10	50	2,9	4205-090401-000000
100	145	82	60	70	18370	367	7350	16840	199	137	232	160	144	10	M12	60	4,1	4205-100401-000000
110	155	82	60	70	20210	367	8080	18520	181	128	214	152	144	10	M12	60	4,5	4205-110401-000000
120	165	82	60	70	24250	404	9700	22230	182	133	219	159	144	11	M12	60	5,0	4205-120401-000000
130	180	91	65	79	33440	514	13380	30650	198	143	238	172	144	14	M12	65	6,6	4205-130401-000000
140	190	91	65	79	38590	551	15430	35360	197	145	240	177	144	15	M12	65	7,1	4205-140401-000000
150	200	91	65	79	41340	551	16540	37890	184	138	227	170	144	15	M12	65	7,5	4205-150401-000000
160	210	91	65	79	47040	588	18820	43110	184	140	230	175	144	16	M12	65	7,8	4205-160401-000000
170	225	106	78	92	64270	756	25710	58900	187	141	228	172	229	15	M14	75	10,8	4205-170401-000000
180	235	106	78	92	68050	756	27220	62370	177	135	218	167	229	15	M14	75	11,3	4205-180401-000000
190	250	116	88	102	76620	806	30650	70220	154	117	188	143	229	16	M14	80	14,8	4205-190401-000000
200	260	116	88	102	90730	907	36290	83150	165	127	203	156	229	18	M14	80	15,7	4205-200401-000000
220	285	124	96	108	113900	1035	45560	104390	154	119	191	147	354	15	M16	90	19,9	4205-220401-000000
240	305	124	96	108	165670	1381	51340	157510	188	148	226	178	354	20	M16	90	21,5	4205-240401-000000
260	325	124	96	108	188450	1450	69720	175070	183	146	230	184	354	21	M16	90	22,8	4205-260401-000000
280	355	130	96	110	225260	1609	83350	209270	198	156	251	198	692	15	M20	90	29,0	4205-280401-000000
300	375	130	96	110	257440	1716	95250	239170	197	158	254	203	692	15	M20	90	31,2	4205-300401-000000
320	405	156	124	136	343250	2145	137300	314590	173	136	218	173	692	20	M20	110	45,9	4205-320401-000000
340	425	156	124	136	364700	2145	145880	334260	162	130	208	167	692	20	M20	110	48,3	4205-340401-000000
360	455	177	140	155	477330	2652	190930	437480	164	130	209	165	945	20	M22	130	67,9	4205-360401-000000
380	475	177	140	155	503850	2652	201540	461790	156	124	200	160	945	20	M22	130	71,4	4205-380401-000000
400	495	177	140	155	583410	2917	233360	534700	163	131	211	171	945	22	M22	130	74,5	4205-400401-000000
420	515	177	140	155	668270	3182	267310	612480	169	138	222	181	945	24	M22	130	77,8	4205-420401-000000
440	535	177	140	155	700090	3182	259030	650410	161	133	210	173	945	24	M22	130	81,4	4205-440401-000000
460	555	177	140	155	731910	3182	270810	679970	154	128	203	169	945	24	M22	130	84,1	4205-460401-000000
480	575	177	140	155	795560	3315	294360	739100	154	129	205	171	945	25	M22	130	88,0	4205-480401-000000
500	595	177	140	155	828700	3315	306620	769890	148	124	199	167	945	25	M22	130	91,6	4205-500401-000000
520	615	177	140	155	965270	3713	357150	896770	159	135	217	183	945	28	M22	130	94,1	4205-520401-000000
540	635	177	140	155	1002400	3713	370890	931260	153	130	211	179	945	28	M22	130	97,5	4205-540401-000000
560	655	177	140	155	1113780	3978	412100	1034740	158	135	220	188	945	30	M22	130	100,7	4205-560401-000000
580	675	177	140	155	1153560	3978	426820	1071690	153	131	214	184	945	30	M22	130	104,2	4205-580401-000000
600	695	177	140	155	1193330	3978	441530	1108650	148	128	209	181	945	30	M22	130	107,6	4205-600401-000000

The technical data provided are based on theoretical calculations and the specified screw tightening torques.

Hub arrangement

For Cone Clamping Elements with a fixed backstop point, the hub must be positioned as shown in figure 14-1.

For Cone Clamping Elements without a fixed backstop point, the hub must be positioned as shown in figure 14-2. In this case, it is assumed for practical purposes that the screw heads of the Cone Clamping Element are flush with the hub on one side

Required hub width

The hub width N_A used in the application must not be smaller than the load-bearing hub width L_1 .

Required hub outer diameter

The hub outer diameter K_A used in the application must not be smaller than the required hub outer diameter K_{min} . The required hub outer diameter K_{min} can be calculated approximately using the hub width N_A used in the application and the corresponding yield strength R_e of the hub material as follows:

$$K_{min} = 1,2 \cdot D \cdot \frac{H - 1,25}{H - 3}$$

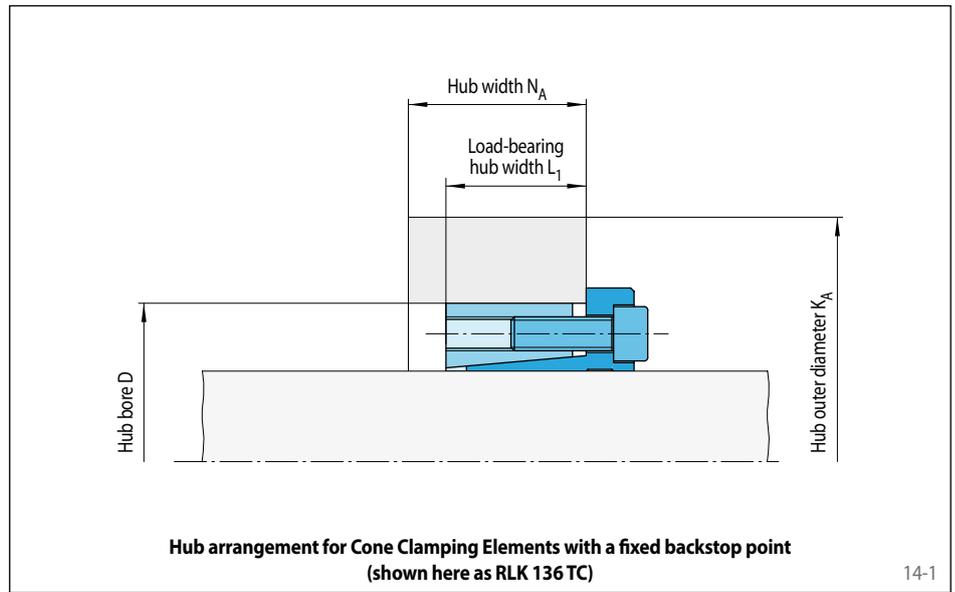
$$\text{with } H = \left(\frac{R_e}{1,27 \cdot P_N} \cdot \frac{N_A}{L_T} \right)^2$$

Required yield strength of the hub material

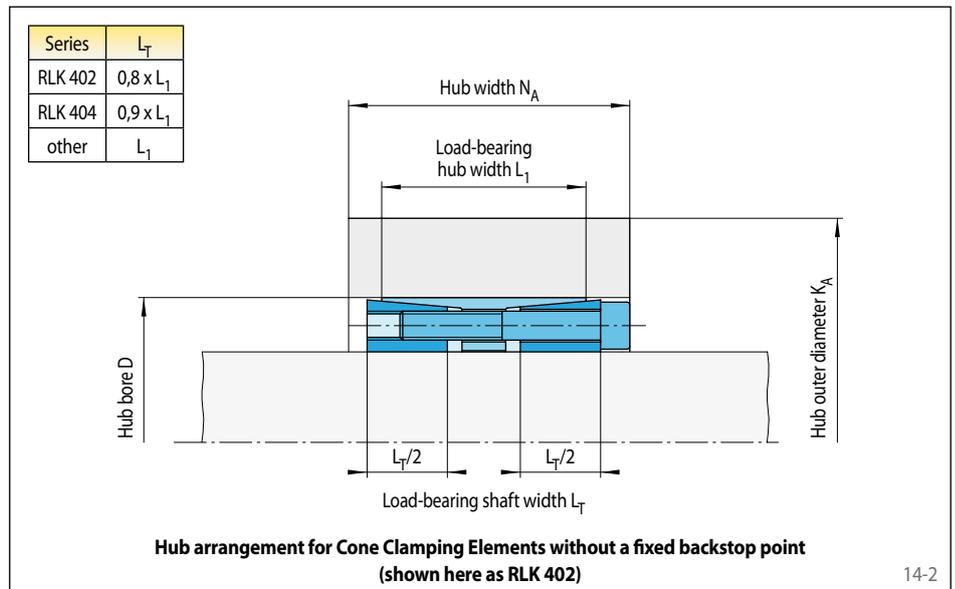
For a given hub width N_A and a given hub outside diameter K_A , the yield strength R_e of the hub material must be greater than the equivalent stress σ_v in the hub.

$$\sigma_v = 1,27 \cdot P_N \cdot \frac{L_T}{N_A} \cdot \frac{\sqrt{3 + C_N^4}}{1 - C_N^2}$$

$$\text{with } C_N = \frac{D}{K_A}$$



14-1



14-2

Formula symbols

C_N = Auxiliary value without unit

D = Hub bore according to table [mm]

H = Auxiliary value without unit

K_A = Hub outer diameter used in the application [mm]

K_{min} = Required hub outer diameter according to calculation [mm]

L_1 = Load-bearing axial hub width according to table [mm]

L_T = Load-bearing shaft width [mm]

N_A = Hub width used in the application [mm]

P_N = Contact pressure at the hub according to table [N/mm²]

R_e = Hub material yield strength [N/mm²]

σ_v = Equivalent stress in the hub [N/mm²]

Clamping screw tightening torque

The tightening torque M_S listed in the tables must be achieved during assembly and must not be exceeded by more than 10%. If the indicated tightening torque M_S is not achieved,

the transmissible torque or axial force, as well as the contact pressures at the shaft and at the hub will be proportionally reduced compared to the values listed in the tables for M or F as

well as for P_W and P_N . When the indicated tightening torque M_S is undercut by more than 30%, please contact us.

Simultaneous transmission of torque and axial force

The transmissible torques M which are shown in the tables apply for axial forces $F = 0$ kN and conversely, the indicated axial forces F apply to torques $M = 0$ Nm. If torque and axial force are to be transmitted simultaneously, the transmissible torque and the transmissible axial force are reduced compared to the values listed in the tables for M and F.

For a given axial force F_A , the reduced torque M_{red} is calculated as:

$$M_{red} = \sqrt{M^2 - (F_A \cdot \frac{d}{2})^2}$$

For a given torque M_A , the reduced axial force F_{red} is calculated as:

$$F_{red} = \frac{2}{d} \sqrt{M^2 - M_A^2}$$

Design of shaft and hub

The transmissible torques or axial forces listed are subject to the following tolerances, surface characteristics and material requirements. Please contact us in the case of deviations.

Tolerances

- h8 for shaft diameter d
- H8 for hub bore D

Surfaces

Average surface roughness at the contact surfaces between the shaft and the hub bore:
 $R_z = 10 \dots 25 \mu\text{m}$.

Materials

The following apply to the shaft and the hub:

- E-module $\geq 170 \text{ kN/mm}^2$

Installation

Please request our installation and operating instructions Cone Clamping Elements.

Formula symbols

d = Shaft diameter according to table [mm]

F = Transmissible axial force according to table [kN]

F_A = Maximum actual application axial force [kN]

F_{red} = Reduced axial force [kN]

M = Transmissible torque according to table [Nm]

M_A = Maximum actual application torque [Nm]

M_{red} = Reduced torque [Nm]

M_S = Screw tightening torque according to table [Nm]

P_N = Contact pressure at the hub according to table [N/mm²]

P_W = Contact pressure at the shaft according to table [N/mm²]

RINGSPANN®

Your benefit is our motivation

↪ Scan me for more information



www. **RINGSPANN®**.com