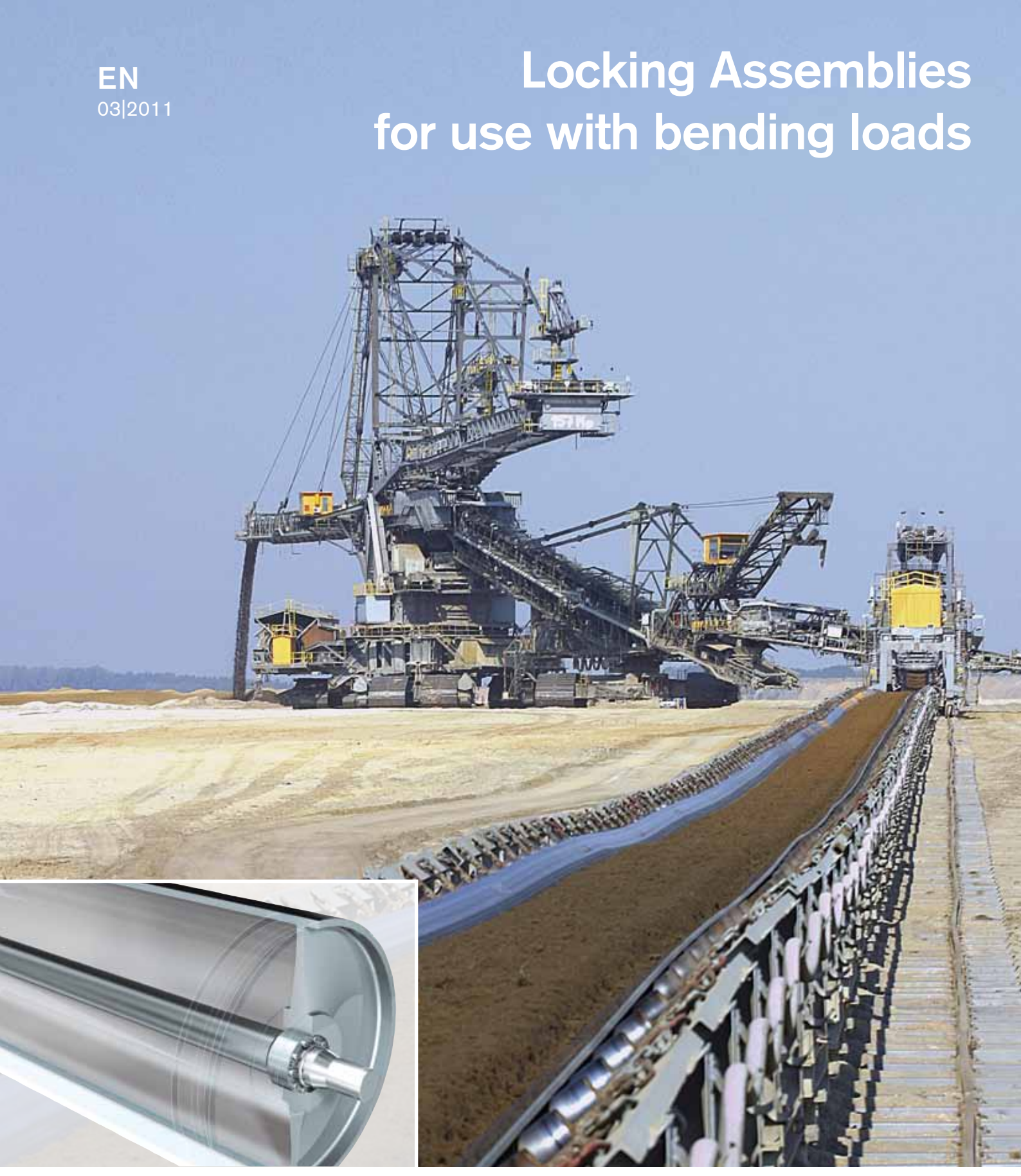
EN
03|2011

Locking Assemblies for use with bending loads



Partner for performance
www.ringfeder.com

RINGFEDER

A Global Presence For You

The RINGFEDER POWER TRANSMISSION GMBH was founded in 1922 in Krefeld, Germany to fabricate and promote Friction Spring technology. Today we have expanded our offerings to top power transmission and damping products. Innovative thinking sets us apart and allows us to develop progressive and economical solutions to support our customers.

Special applications require special solutions

Our extensive range of RINGFEDER POWER TRANSMISSION products can be applied to solve most applications. We don´t just sell, but by understanding the individual requirements of our customers (e.g. loads on the components, easy installation/removal capability and reduction of production costs) assist you in every step with innovative engineering to plan efficient and technically mature solutions.

Locking Assemblies for use with bending loads

One of the most demanding challenges on our promise of performance is the belt drum application field. The extreme loads which such components are subject to, especially the high bending moment, coupled with the simultaneous indispensable reliability and longest-possible service life require the highest in engineering know-how. Our international development team, which has already set benchmarks in quality Locking Assemblies for the RfN 7012, RfN 7012.2, RfN 7015.0 and RfN 7015.1 products, is now setting a further milestone.

The new development of the RfN 7515 Locking Assemblies has set a new benchmark in this segment with its quality, performance and price range.

Quality means: high-quality materials and material services, and the most precise workmanship, guarantee sustainable product usage.

Performance means: reliability, and long service life means: minimisation of machine standstill and maximisation of service life.

Price means: not just the newest, but also the cheapest RINGFEDER Locking Assemblies product at the high level of performance you are used to.

Belt drum with Locking Assemblies and a shrink disc on the drive side

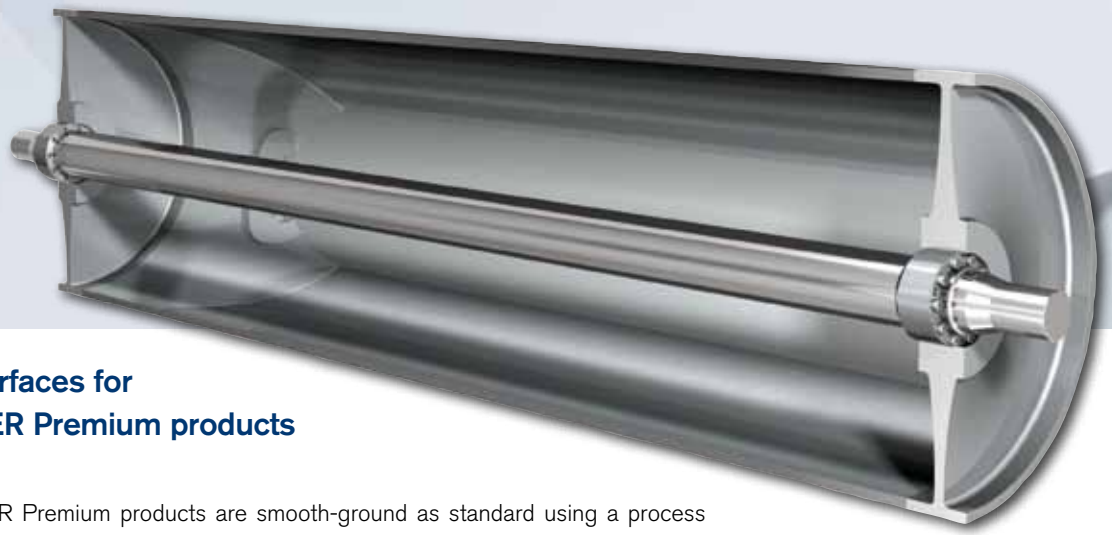
Ready-for-shipping belt drum with Locking Assemblies

Locking Assemblies for use with bending loads

Surface roughness measurement

Hardness measurement

3-D measurement



Special surfaces for RINGFEDER Premium products

All RINGFEDER Premium products are smooth-ground as standard using a process specially developed for us. Account to this special quality feature, a consistent reproducible coefficient of friction is achieved for all Locking Assembly contact surfaces.

This exceptionally important reproducibility guarantees the consistent of defined pressure on which all Locking Assembly technical values are based.

Merely turned surfaces, even those which are precision-turned, have slip-stick effects if the cone is displaced. A type of indenting also takes place. The considerable coefficient of friction deviations which occur due to this affect the pressure, the torque transfer and the stresses in all components. Removal of the Locking Assembly is also made considerably more difficult.

RfN 7012

RfN 7012.2

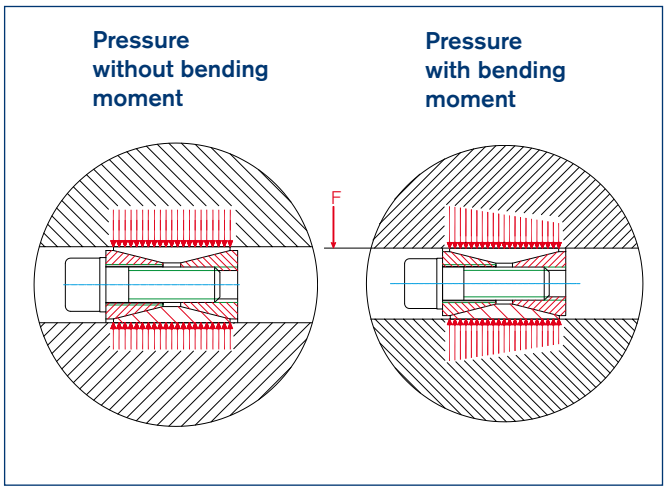
RfN 7015.0

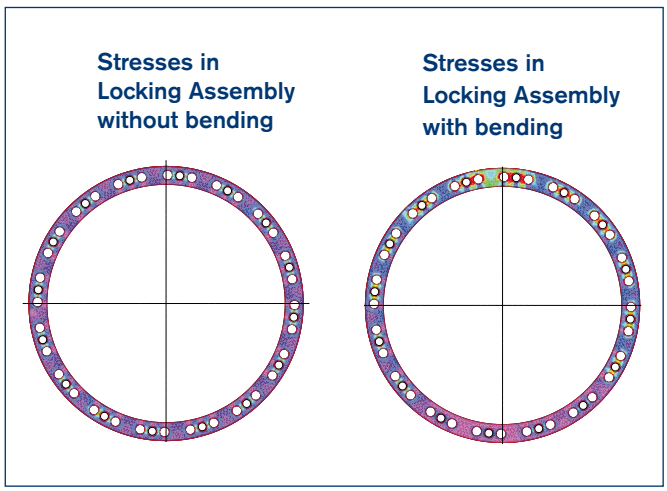
RfN 7015.1

RfN 7515

Pressures and stresses in Locking Assembly taking bending moment into consideration

Without bending moment loading, pressures on the contact areas of the Locking Assembly between the shaft and drum end disc is evenly distributed. Under bending moment, the pressure increases on one side and decreases rotary on the opposing side during each drum rotation. In this case, the stresses in the Locking Assembly between the bores on the side with higher pressure are subject to extreme increases, and these can destroy Locking Assemblies made of too soft or low-quality materials very quickly.

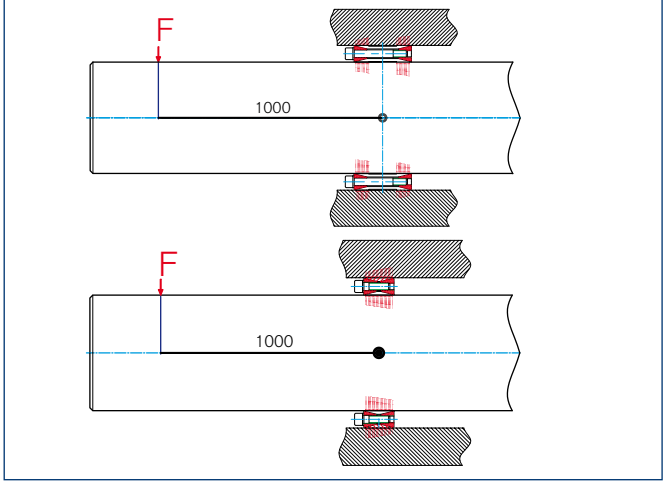




Influence of Locking Assembly width on pressure under bending moment loading

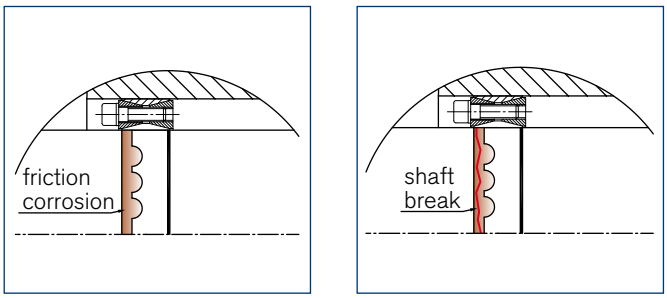
Ever wider the Locking Assembly, so much larger the leverage. In other words, larger Locking Assembly widths produce larger leverage. This means that pressure changes under bending loads are lower for wider Locking Assemblies, which in turn means that their behaviour under bending moment loads are more advantageous.

Influence of Locking Assembly width on pressures



Shaft breakage due to fretting corrosion

The Locking Assembly can be subject to localised lifting on the side with lower pressure. Micro-movements between the Locking Assembly and the adjacent components occur. The fretting corrosion which results from this causes surface damage, which can lead to cracks or even shaft breakage in worst cases.



Hub loads due to pressure increases

The hub (drum end disc) is loaded over its whole circumference by the increased pressures. This means it is imperative that the drum end disc is designed to meet the maximum occurring pressure. Drum end disc which have been designed too weakly deform in a plastic manner and lead to connection failures. Drive pulleys slip if the drum end disc deforms in a plastic manner and tail pulleys start to „move“ axially.

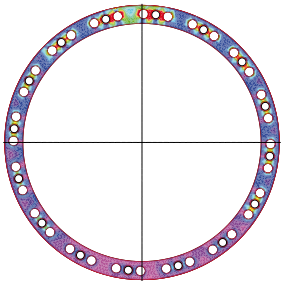
Influence of material strength on transmissible bending moment

The loading limits can be considerably increased for applications which fall below the stated web stresses for the standard RfN 7012 Locking Assembly through the use of Locking Assemblies made of high-quality materials, e.g.: RfN 7012.2 (here, the material yield strength is around 40% greater than that of the standard Locking Assembly). This results in a tripling of the transmissible bending moment.

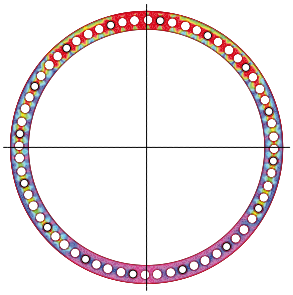
Influence of number of bores on stresses in Locking Assemblies

The number of bores made, which weaken the pressure ring, significantly influences the stresses in the Locking Assembly. Stresses can be considerably reduced through the use of lower number of bores, and the reserves made available by this can be used for additional bending moment loads.

Lower number of bores - lower stress at bending moment



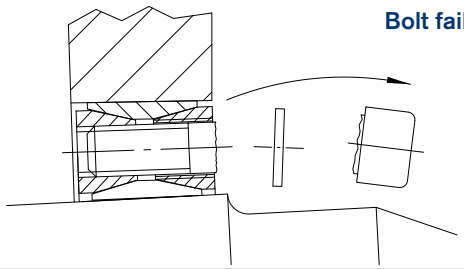
High number of bores - higher stress at bending moment



Bolt failure under excessive bending moment

The shaft deflection caused by the circumferential belt tension applies load to the clamping bolts every drum rotation. This additional axial loading leads to fatigue failures and bolt head breakage if the bolts are fully tightened. For this reason, the bolt tightening torques must be reduced depending on the series if Locking Assembly applications are subject to bending loads.

Bolt failure



Shaft torsion and therefore no torque division on both drum ends

The shaft is torsionally softer than the drum body. For this reason, the entire torque must be transferred to the drive side. Torque division on both Locking Assemblies results in the destruction of the Locking Assembly on the drive side. (See drawing)

Shaft torsion

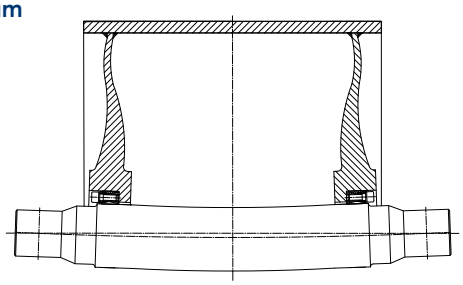
Start-up factor for belt drives

When belt equipment starts up, the electric motor briefly applies around 2.5 times the nominal torque. The drum fixing therefore needs to be designed to accept the start-up torque loading. If not, the connection slips or the Locking Assembly is destroyed after a short time.

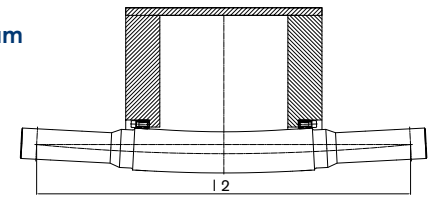
Bending moment division between shaft and drum end disc

The Locking Assembly must transfer the entire bending moment if the end disc is very stiff. If the drum end disc is flexible, the bending moment to be transferred is divided between the end disc and drum shaft - the stresses from the bending moment are reduced and the Locking Assembly is protected.

Soft drum



Stiff drum



Function between bending moment, torque, pressure and bolt tightening torque

Sample values from calculation for 400 x 495 RfN 7012				
T_a	M_b	pw	pn	$T_{res.}$
Nm	**Nm**	**N/mm²**	**N/mm²**	**Nm**
780	0	123	99	311700
780	73400	169	137	302900
468	0	74	60	187000
468	73400	120	97	172000
780	**146800**	**215**	**174**	**275000**
Sample values from calculation for 400 x 495 RfN 7012.2				
780	**146800**	**228**	**184**	**311200**
780	200000	261	211	280000

- *This Locking Assembly was destroyed by overloading*
- *This Locking Assembly is able to transfer the required loads*

Explanations to tables

d, D, L, l, L_1 = Basic dimensions, Locking Assemblies not tightened

d	=	**Locking Assembly internal diameter**
D	=	**Locking Assembly external diameter**
L	=	**length Locking Assembly**
l	=	**clamping length Locking Assembly**
L_1	=	**overall length Locking Assembly**
T_A red.	=	**maximum bolt tightening torque under bending moment load**
T without M_b	=	**transmissible torque without bending moment**
p_W without M_b	=	**shaft pressure without bending moment**
p_N without M_b	=	**hub pressure without bending moment**
M_b max.	=	**maximum transmissible bending moment at indicated bolt tightening torque**
$T_{res.}$	=	**remaining transmissible torque at indicated M_b and T_a**
p_W at M_b max.	=	**shaft pressure at indicated M_b max. and T_a**
p_N at M_b max.	=	**hub pressure at indicated M_b max. and T_a**

Locking Assemblies for bending moments **RfN 7012**

Locking Assembly dimensions													
d	x	D	L	l	L_1	T_A red.	T without M_b	p_W without M_b	p_N without M_b	M_b max.	$T_{res.}$	p_W at M_b max.	p_N at M_b max.
mm						Nm	kNm	N/mm²		kNm		N/mm²	
100	x	145	33	26	47	125	9,6	196	135	2,6	9,2	245	169
110	x	155	33	26	47	125	10,5	177	126	2,7	10,1	223	158
120	x	165	33	26	47	125	13,0	184	134	3,0	12,7	231	168
130	x	180	38	34	52	125	17,5	162	117	5,0	16,8	216	154
140	x	190	38	34	52	125	20,7	164	121	5,3	20,0	218	161
150	x	200	38	34	52	125	24,0	167	125	5,9	23,3	223	167
160	x	210	38	34	52	125	27,7	169	129	6,2	27,0	224	170
170	x	225	44	38	60	190	32,4	157	119	7,8	31,5	206	155
180	x	235	44	38	60	190	37,3	161	123	8,6	36,4	212	162
190	x	250	52	46	68	190	45,9	147	111	12,0	44,3	194	148
200	x	260	52	46	68	190	51,6	149	114	12,7	50,0	197	151
220	x	285	56	50	74	295	66,4	146	112	16,5	64,3	194	150
240	x	305	56	50	74	295	83,1	153	120	15,6	81,6	195	154
260	x	325	56	50	74	295	101,5	159	127	13,4	100,6	193	148
280	x	355	66	60	86,5	405	124,2	140	111	28,9	120,8	186	142
300	x	375	66	60	86,5	405	149,1	146	117	20,2	147,7	178	143
320	x	405	78	72	100,5	580	207,1	149	118	31,0	204,8	181	150
340	x	425	78	72	100,5	580	219,2	140	112	48,2	213,9	187	143
360	x	455	90	84	116	780	282,4	138	109	62,4	275,4	181	142
380	x	475	90	84	116	780	297,1	130	104	72,4	288,2	178	137
400	x	495	90	84	116	780	311,7	123	99	73,4	303,0	169	141
420	x	515	90	84	116	780	362,6	130	106	73,1	355,1	173	136
440	x	545	102	96	130	1000	442,8	126	102	94,6	432,6	168	135
460	x	565	102	96	130	1000	461,7	121	98	106,0	449,4	165	136
480	x	585	102	96	130	1000	504,5	121	99	111,0	492,1	166	135
500	x	605	102	96	130	1000	549,1	121	100	108,0	528,4	163	135
520	x	630	102	96	130	1000	582,7	119	98	120,0	570,2	164	131
540	x	650	102	96	130	1000	603,6	114	95	120,0	591,6	158	134
560	x	670	102	96	130	1000	666,2	117	99	124,0	654,6	160	135
580	x	690	102	96	130	1000	717,2	118	99	128,0	705,7	161	135
600	x	710	102	96	130	1000	740,3	114	96	133,0	728,3	157	132
620	x	730	102	96	130	1000	794,0	114	97	137,0	782,0	157	133
640	x	750	102	96	130	1000	849,4	115	98	136,0	838,5	156	133

Ordering example: RfN 7012

Series	d	D
RfN 7012	160	210

Remark! The values of the shaft- and hub pressures have been calculated with the screw tightening shown in the tables. Increase resp. reduction of the screw tightening torque results in different calculation values!

A special bolt for type **RfN 7012.2** has been developed by RINGFEDER for the increased requirements occurring when subject to loading by bending moment.

These special bolts guarantee loadings above strength class 12.9 at simultaneous higher expansion with regard to tensile strength and yield strength.

These bolts were manufactured specially for RINGFEDER with qualified steel analysis.

Every bolt is labelled with RPT-B and the batch number. This allows every bolt to be traced back to manufacture.

The benefit of this bolt is the considerably increased fracture resistance under additional bending stress.

Explanations to tables

d, D, L, l, L_1 = Basic dimensions, Locking Assemblies not tightened

d	=	**Locking Assembly internal diameter**
D	=	**Locking Assembly external diameter**
L	=	**length Locking Assembly**
l	=	**clamping length Locking Assembly**
L_1	=	**overall length Locking Assembly**
T_A red.	=	**maximum bolt tightening torque under bending moment load**
T without M_b	=	**transmissible torque without bending moment**
p_W without M_b	=	**shaft pressure without bending moment**
p_N without M_b	=	**hub pressure without bending moment**
M_b max.	=	**maximum transmissible bending moment at indicated bolt tightening torque**
$T_{res.}$	=	**remaining transmissible torque at indicated M_b and T_a**
p_W at M_b max.	=	**shaft pressure at indicated M_b max. and T_a**
p_N at M_b max.	=	**hub pressure at indicated M_b max. and T_a**

Locking Assemblies for bending moments **RfN 7012.2**

Locking Assembly dimensions													
d	x	D	L	l	L_1	T_A red.	T without M_b	p_W without M_b	p_N without M_b	M_b max.	$T_{res.}$	p_W at M_b max.	p_N at M_b max.
mm						Nm	kNm	N/mm²		kNm		N/mm²	
100	x	145	33	26	47	125	10,4	212	146	10,0	2,9	400	276
110	x	155	33	26	47	125	11,4	192	136	10,3	4,8	368	261
120	x	165	33	26	47	125	14,2	202	147	11,8	8,0	387	281
130	x	180	38	34	52	125	19,5	180	130	15,2	12,1	346	250
140	x	190	38	34	52	125	23,1	184	135	16,0	16,6	346	255
150	x	200	38	34	52	125	26,9	187	140	14,6	22,6	326	244
160	x	210	38	34	52	125	31,1	190	144	13,3	28,0	308	235
170	x	225	44	38	60	190	36,2	175	132	25,9	25,4	337	254
180	x	235	44	38	60	190	41,9	180	138	28,5	30,7	348	267
190	x	250	52	46	68	190	51,7	165	126	37,0	36,1	312	237
200	x	260	52	46	68	190	56,3	162	125	40,0	39,6	313	241
220	x	285	56	50	74	295	74,6	164	126	50,4	55,0	313	241
240	x	305	56	50	74	295	84,2	155	122	51,9	66,3	296	233
260	x	325	56	50	74	295	104,7	164	131	48,9	92,6	287	229
280	x	355	66	60	86,5	405	131,6	148	117	82,0	102,9	285	225
300	x	375	66	60	86,5	405	145,2	143	114	83,0	119,2	272	217
320	x	405	78	72	100,5	580	201,7	145	115	126,0	157,5	276	218
340	x	425	78	72	100,5	580	220,6	141	113	132,0	176,8	270	216
360	x	455	90	84	116	780	293,4	143	113	178,0	233,2	267	211
380	x	475	90	84	116	780	318,3	139	111	194,0	252,4	267	213
400	x	495	90	84	116	780	344,1	136	110	202,0	278,6	262	212
420	x	515	90	84	116	780	392,0	140	114	195,0	340,1	256	209
440	x	545	102	96	130	1000	478,8	137	110	251,0	407,7	247	200
460	x	565	102	96	130	1000	512,6	134	109	282,0	428,1	253	206
480	x	585	102	96	130	1000	547,5	131	108	295,0	461,3	251	206
500	x	605	102	96	130	1000	598,1	132	109	304,0	515,0	250	207
520	x	630	102	96	130	1000	635,6	130	107	315,0	552,0	247	204
540	x	650	102	96	130	1000	674,2	128	106	324,0	591,2	244	203
560	x	670	102	96	130	1000	730,0	129	108	339,0	646,5	246	206
580	x	690	102	96	130	1000	787,9	129	109	353,0	704,4	248	208
600	x	710	102	96	130	1000	830,7	128	108	366,0	745,7	246	208
620	x	730	102	96	130	1000	874,5	126	107	365,0	794,6	240	204
640	x	750	102	96	130	1000	956,0	129	110	364,0	884,0	239	204

Ordering example: RfN 7012.2

Series	d	D
RfN 7012.2	200	260

Remark! The values of the shaft- and hub pressures have been calculated with the screw tightening shown in the tables. Increase resp. reduction of the screw tightening torque results in different calculation values!

Explanations to tables

d, D, L, l, L_1 = Basic dimensions, Locking Assemblies not tightened

d	=	**Locking Assembly internal diameter**
D	=	**Locking Assembly external diameter**
L	=	**length Locking Assembly**
l	=	**clamping length Locking Assembly**
L_1	=	**overall length Locking Assembly**
T_A red.	=	**maximum bolt tightening torque under bending moment load**
T without M_b	=	**transmissible torque without bending moment**
p_W without M_b	=	**shaft pressure without bending moment**
p_N without M_b	=	**hub pressure without bending moment**
M_b max.	=	**maximum transmissible bending moment at indicated bolt tightening torque**
$T_{res.}$	=	**remaining transmissible torque at indicated M_b and T_a**
p_W at M_b max.	=	**shaft pressure at indicated M_b max. and T_a**
p_N at M_b max.	=	**hub pressure at indicated M_b max. and T_a**

Locking Assemblies for bending moments **RfN 7015.0**

Locking Assembly dimensions													
d	x	D	L	l	L_1	T_A red.	T without M_b	p_W without M_b	p_N without M_b	M_b max.	$T_{res.}$	p_W at M_b max.	p_N at M_b max.
mm						Nm	kNm	N/mm²		kNm		N/mm²	
100	x	145	65	60	77	115	11,3	157	108	10,9	3,0	214	147
110	x	155	65	60	77	115	12,4	142	101	10,9	6,0	194	138
120	x	165	65	60	77	115	16,3	157	114	13,0	9,8	213	155
130	x	180	74	68	86	115	22,0	156	113	18,0	12,7	212	153
140	x	190	74	68	86	115	28,5	174	128	19,0	21,2	229	169
150	x	200	74	68	86	115	30,5	163	122	21,5	21,6	220	165
160	x	210	74	68	86	115	38,0	178	136	20,0	32,3	228	174
170	x	225	81	75	95	185	48,0	179	135	32,0	35,7	241	182
180	x	235	81	75	95	185	50,8	169	129	32,5	39,0	229	175
190	x	250	94	88	108	185	59,6	149	113	41,5	42,7	202	154
200	x	260	94	88	108	185	75,2	170	131	25,0	71,0	201	155
220	x	285	104	98	120	285	84,8	152	117	61,0	58,9	208	161
240	x	305	104	98	120	285	123,3	186	146	45,0	114,8	224	177
260	x	325	104	98	120	285	139,2	178	143	42,5	132,5	212	170
280	x	355	126	120	144	390	174,1	161	127	120,0	126,1	221	174
300	x	375	126	120	144	390	194,3	157	125	126,0	147,9	216	173
320	x	405	142	135	162	550	265,7	159	125	155,0	215,8	211	167
340	x	425	142	135	162	550	282,3	149	120	177,0	219,9	206	164
360	x	455	165	158	187	745	371,1	149	118	250,0	274,3	204	161
380	x	475	165	158	187	745	391,8	141	113	249,0	302,5	193	154
400	x	495	165	158	187	745	412,4	134	108	250,0	328,0	184	148
420	x	515	165	158	187	745	519,6	153	125	300,0	424,3	210	171
440	x	545	180	172	204	960	639,7	154	124	370,0	521,8	210	170
460	x	565	180	172	204	960	668,8	147	120	370,0	557,1	200	163
480	x	585	180	172	204	960	744,4	150	123	395,0	647,0	182	149
500	x	605	180	172	204	960	775,4	144	119	395,0	667,2	197	163
520	x	630	200	190	227	1440	1014,4	156	129	530,0	864,9	211	174
540	x	650	200	190	227	1440	1053,4	150	125	530,0	910,3	203	168
560	x	670	200	190	227	1440	1092,4	145	121	530,0	955,2	195	163
580	x	690	200	190	227	1440	1131,4	140	118	532,0	998,5	189	159
600	x	710	200	190	227	1440	1248,4	144	122	566,0	1.112,8	195	164
620	x	730	200	190	227	1440	1290,1	140	119	573,0	1.155,8	189	160
640	x	750	200	190	227	1440	1456,5	148	126	576,0	1.337,8	196	168

Ordering example: RfN 7015.0

Baureihe/*Series*	d	D
RfN 7015.0	240	305

Remark! The values of the shaft- and hub pressures have been calculated with the screw tightening shown in the tables. Increase resp. reduction of the screw tightening torque results in different calculation values!

Explanations to tables

d, D, L, l, L_1 = Basic dimensions, Locking Assemblies not tightened

d	=	**Locking Assembly internal diameter**
D	=	**Locking Assembly external diameter**
L	=	**length Locking Assembly**
l	=	**clamping length Locking Assembly**
L_1	=	**overall length Locking Assembly**
T_A	=	**maximum bolt tightening torque under bending moment load**
T without M_b	=	**transmissible torque without bending moment**
p_W without M_b	=	**shaft pressure without bending moment**
p_N without M_b	=	**hub pressure without bending moment**
M_b max.	=	**maximum transmissible bending moment at indicated bolt tightening torque**
$T_{res.}$	=	**remaining transmissible torque at indicated M_b and T_a**
p_W at M_b max.	=	**shaft pressure at indicated M_b max. and T_a**
p_N at M_b max.	=	**hub pressure at indicated M_b max. and T_a**

Locking Assemblies for bending moments **RfN 7015.1**

Locking Assembly dimensions						T_A	T without M_b	p_W without M_b	p_N without M_b	M_b max.	T res.	p_W at M_b max.	p_N at M_b max.
d	x	D	L	l	L_1								
mm						Nm	kNm	N/mm²		kNm		N/mm²	
100	x	145	65	60	75	83	6,6	91	63	6,1	2,5	123	85
110	x	155	65	60	75	83	8,0	92	65	6,8	4,3	124	88
120	x	165	65	60	75	83	10,5	101	74	8,1	6,7	137	99
130	x	180	74	68	84	83	14,2	101	73	11,0	9,1	135	98
140	x	190	74	68	84	83	15,3	94	69	11,0	10,7	125	92
150	x	200	74	68	84	83	17,5	94	70	11,7	13,1	125	94
160	x	210	74	68	84	83	21,0	99	75	13,2	16,4	132	100
170	x	225	81	75	93	145	27,4	105	80	17,4	21,1	140	106
180	x	235	81	75	93	145	30,9	106	81	18,2	25,0	140	107
190	x	250	94	88	106	145	36,7	96	73	24,5	27,3	128	97
200	x	260	94	88	106	145	42,9	101	78	27,0	33,4	135	104
220	x	285	104	98	116	145	49,6	89	69	34,6	35,5	121	93
240	x	305	104	98	116	145	61,8	93	73	39,0	47,9	126	99
260	x	325	104	98	116	145	75,3	97	77	44,7	60,6	132	105
280	x	355	126	120	140	230	115,0	106	84	74,0	88,1	144	113
300	x	375	126	120	140	230	123,3	99	80	74,1	98,5	134	107
320	x	405	142	135	158	355	180,0	110	87	113,0	140,1	148	117
340	x	425	142	135	158	355	191,2	103	83	111,0	155,7	139	111
360	x	455	165	158	183	485	209,6	84	67	132,0	162,8	113	90
380	x	475	165	158	183	485	248,9	90	72	149,0	199,4	121	97
400	x	495	165	158	183	485	310,6	101	82	177,0	255,2	136	110
420	x	515	165	158	183	485	326,1	96	78	177,0	273,9	130	106
440	x	545	180	172	200	690	372,8	91	74	206,0	310,7	122	99
460	x	565	180	172	200	690	389,7	87	71	211,0	327,7	118	96
480	x	585	180	172	200	690	451,8	93	76	234,0	386,5	125	103
500	x	605	180	172	200	690	470,7	89	74	236,0	407,2	120	99
520	x	630	200	190	220	690	522,1	80	66	272,0	445,7	108	89
540	x	650	200	190	220	690	542,2	77	64	274,0	467,9	104	87
560	x	670	200	190	220	690	632,6	84	70	309,0	552,0	113	95
580	x	690	200	190	220	690	655,2	81	68	304,0	580,4	109	92
600	x	710	200	190	220	690	677,8	78	66	305,0	605,3	105	89
620	x	730	200	190	220	690	700,4	76	64	307,0	629,5	102	87
640	x	750	200	190	220	690	723,0	73	63	307,0	654,5	99	85

Ordering example: RfN 7015.1

Series	d	D
RfN 7015.1	620	730

Remark! The values of the shaft- and hub pressures have been calculated with the screw tightening shown in the tables. Increase resp. reduction of the screw tightening torque results in different calculation values!

Explanations to tables

d, D, L, l, L_1 = Basic dimensions, Locking Assemblies not tightened

d	=	**Locking Assembly internal diameter**
D	=	**Locking Assembly external diameter**
L	=	**length Locking Assembly**
l	=	**clamping length Locking Assembly**
L_1	=	**overall length Locking Assembly**
T_A	=	**maximum bolt tightening torque under bending moment load**
T without M_b	=	**transmissible torque without bending moment**
p_W without M_b	=	**shaft pressure without bending moment**
p_N without M_b	=	**hub pressure without bending moment**
M_b max.	=	**maximum transmissible bending moment at indicated bolt tightening torque**
$T_{res.}$	=	**remaining transmissible torque at indicated M_b and T_a**
p_W at M_b max.	=	**shaft pressure at indicated M_b max. and T_a**
p_N at M_b max.	=	**hub pressure at indicated M_b max. and T_a**

Locking Assemblies for bending moments **RfN 7515**

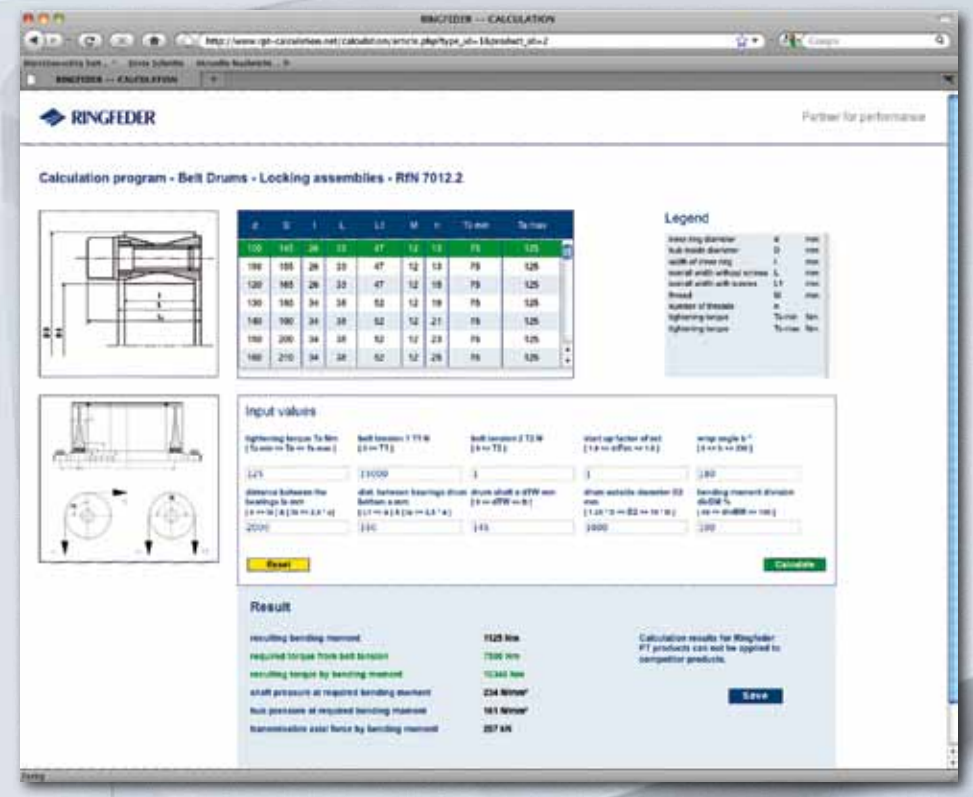
Locking Assembly dimensions						T_A	T without M_b	p_W without M_b	p_N without M_b	M_b max.	T res.	p_W at M_b max.	p_N at M_b max.
d	x	D	L	l	L_1								
mm						Nm	kNm	N/mm²		kNm		N/mm²	
100	x	145	70	60	82	145	18,9	209	144	8,1	17,1	245	169
110	x	155	70	60	82	145	20,8	190	135	9,0	18,7	227	161
120	x	165	70	60	82	145	24,9	191	139	11,0	22,4	233	169
130	x	180	79	65	91	145	34,4	207	150	12,5	32,0	242	175
140	x	190	79	65	91	145	39,7	206	152	16,4	36,1	249	183
150	x	200	79	65	91	145	42,5	193	144	18,0	38,5	236	177
160	x	210	79	65	91	145	48,3	193	147	19,0	44,5	236	180
170	x	225	92	78	106	230	65,8	195	147	25,0	60,9	234	177
180	x	235	92	78	106	230	69,7	184	141	27,6	64,0	225	172
190	x	250	102	88	116	230	78,4	165	125	33,5	70,9	202	154
200	x	260	102	88	116	230	92,9	176	135	39,5	84,1	218	168
220	x	285	110	96	124	355	116,5	173	133	52,0	104,2	216	167
240	x	305	110	96	124	355	169,4	211	166	43,0	163,8	244	192
260	x	325	110	96	124	355	192,7	184	148	77,2	176,5	237	190
280	x	355	110	96	130	690	230,2	205	162	105,0	204,9	273	216
300	x	375	110	96	130	690	263,1	204	163	109,5	239,2	271	217
320	x	405	136	124	156	690	350,8	189	150	141,6	320,9	242	191
340	x	425	136	124	156	690	372,7	178	143	154,0	339,4	232	185
360	x	455	155	140	177	930	487,6	174	137	219,0	435,6	228	180
380	x	475	155	140	177	930	514,6	164	132	228,0	461,4	218	174
400	x	495	155	140	177	930	595,9	172	139	240,8	545,1	226	182
420	x	515	155	140	177	930	682,6	179	146	277,6	623,6	237	194
440	x	535	155	140	177	930	715,1	170	138	306,0	646,3	232	188
460	x	555	155	140	177	930	747,6	163	133	320,0	675,6	225	183
480	x	575	155	140	177	930	812,6	163	133	341,0	737,6	226	185
500	x	595	155	140	177	930	846,5	156	129	352,0	769,8	219	181
520	x	615	155	140	177	930	985,9	168	139	418,0	893,0	240	198
540	x	635	155	140	177	930	1023,9	162	135	432,0	928,3	233	194
560	x	655	155	140	177	930	1137,6	167	140	471,0	1035,6	242	203
580	x	675	155	140	177	930	1178,3	162	136	479,6	1076,2	235	198
600	x	695	155	140	177	930	1218,9	156	132	505,0	1109,4	231	195
620	x	715	155	140	177	930	1259,5	151	128	515,0	1149,4	225	191
640	x	735	155	140	177	930	1300,2	146	125	522,0	1190,8	219	187

Ordering example: RfN 7515

Series	d	D
RfN 7515	300	375

Remark! The values of the shaft- and hub pressures have been calculated with the screw tightening shown in the tables. Increase resp. reduction of the screw tightening torque results in different calculation values!

Calculation program



In order to meet the complex requirements on the correct design and selection of RINGFEDER products under bending moment loading, RINGFEDER POWER TRANSMISSION GMBH has developed a calculation program.

This calculation program offers the engineer a valuable aid in the calculation of forces and loads occurring in materials subject to bending moment.

After the product has been selected, e.g. RfN 7012, RfN 7012.2, RfN 7015.0, RfN 7015.1 or RfN 7515, the engineer first selects the required diameter of the Locking Assembly. After this, the engineer can make his input and start the calculation.

The results field shows immediately whether the torque resulting from the belt tensions is above the required torque, in addition to the output of further calculation results, and whether the product complies with the loads under bending moment loading at the selected size.

Interested? Visit our website **www.ringfeder.com!**

Fax Inquiry

+49 (0) 6022 2204 - 11

For a design proposal using RINGFEDER® Locking Assemblies in belt drums

To: RINGFEDER POWER TRANSMISSION GMBH / sales.international@ringfeder.com

From:

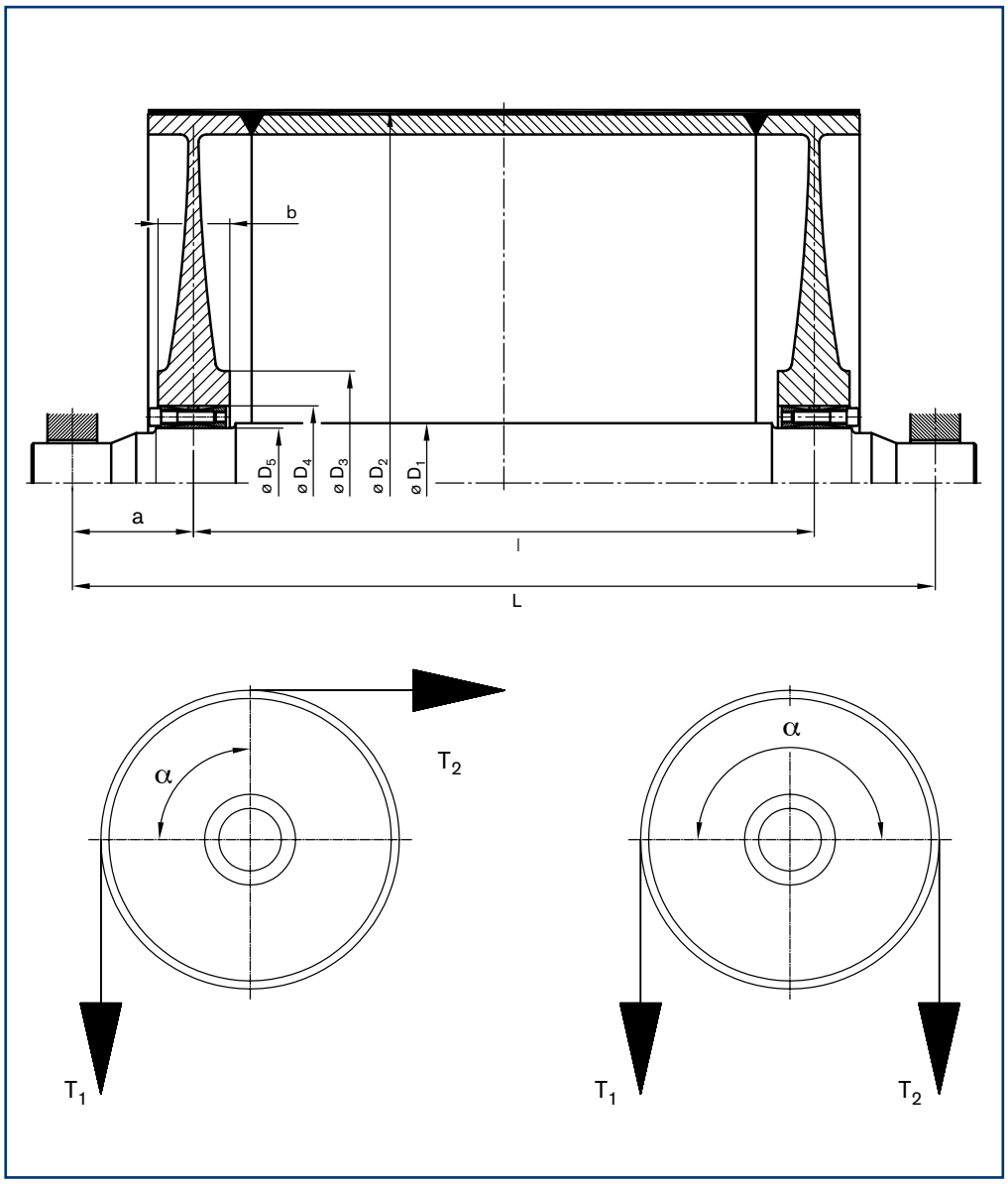
Company: .....

Contact: .....

Phone: .....

Fax: .....

E-Mail: .....



Dimensions:

D_1 = _____ mm

D_2 = _____ mm

D_3 = _____ mm

D_4 = _____ mm

D_5 = _____ mm

L = _____ mm

l = _____ mm

a = _____ mm

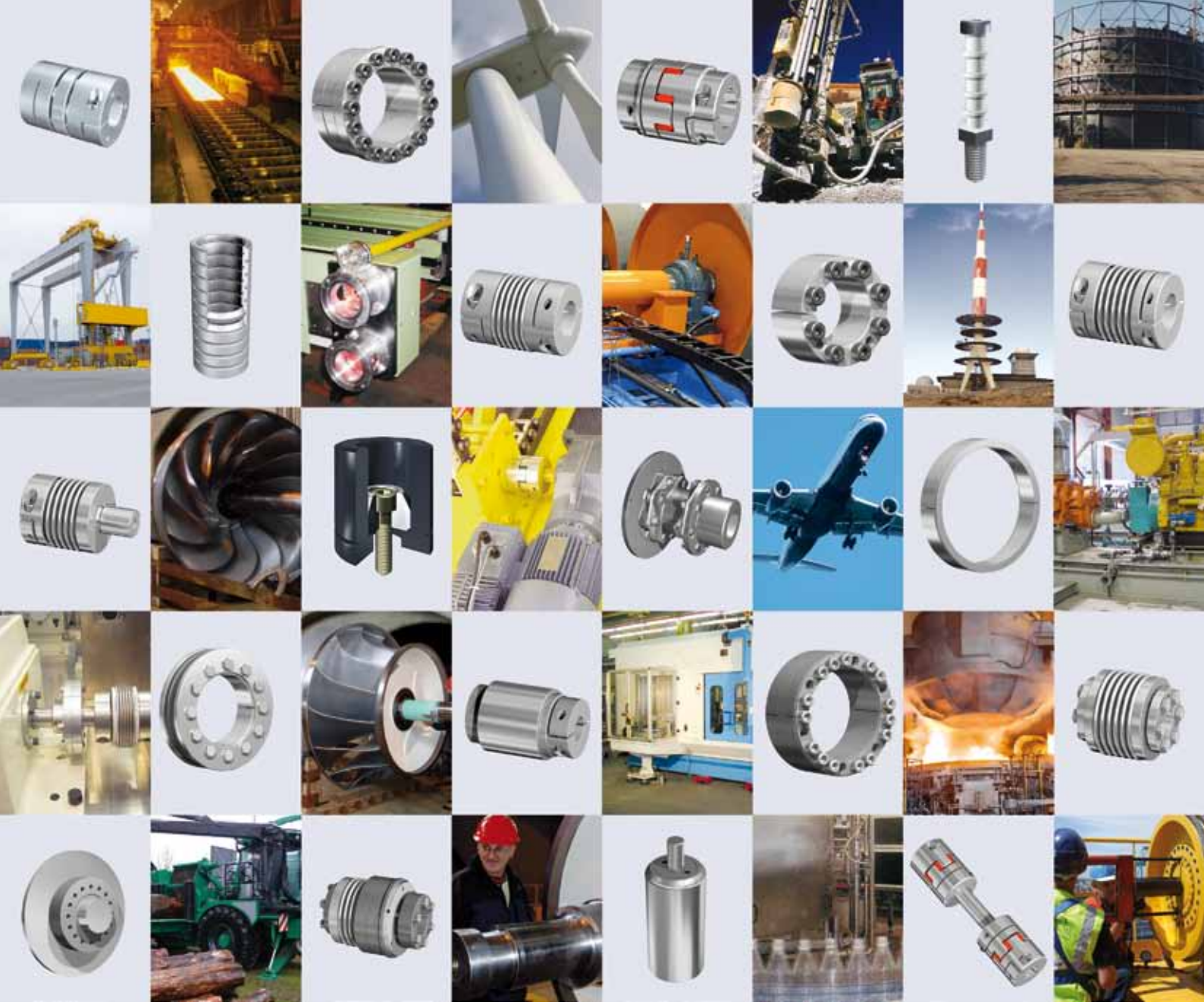
b = _____ mm

Loads:

T_1 = _____ N

α = _____ °

T_2 = _____ N



RINGFEDER POWER TRANSMISSION GMBH
Werner-Heisenberg-Straße 18, D-64823 Groß-Umstadt, Germany · Phone: +49 (0) 6078 9385-0 · Fax: +49 (0) 6078 9385-100
E-mail: sales.international@ringfeder.com · E-mail: sales.international@gerwah.com

RINGFEDER POWER TRANSMISSION USA CORPORATION
165 Carver Avenue, P.O. Box 691 Westwood, NJ 07675, USA · Toll Free: +1 888 746-4333 · Phone: +1 201 666 3320
Fax: +1 201 664 6053 · E-mail: sales.usa@ringfeder.com · E-mail: sales.usa@gerwah.com

RINGFEDER POWER TRANSMISSION INDIA PRIVATE LIMITED
Plot No. 4, Door No. 220, Mount - Poonamallee Road, Kattupakkam, Chennai – 600 056, India
Phone: +91 (0) 44-2679-1411 · Fax: +91 (0) 44-2679-1422 · E-mail: sales.india@ringfeder.com · E-mail: sales.india@gerwah.com

KUNSHAN RINGFEDER POWER TRANSMISSION COMPANY LIMITED
German Industry Park, No. 508 Hengguanjing Road, Zhangpu Town 215321, Kunshan City, P.R. China
Phone: +86 (0) 512-5745-3960 · Fax: +86 (0) 512-5745-3961 · E-mail sales.china@ringfeder.com