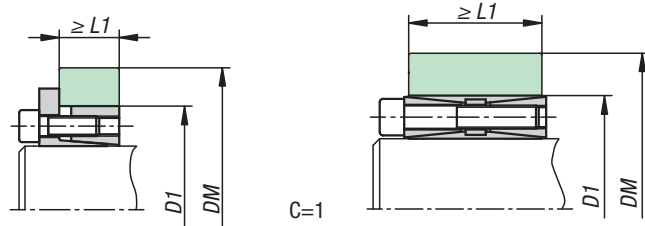


Calculating the minimum hub diameter

The required minimum hub diameter depends on the hub form, the hub cross section and the yield point of the hub material. The formulas and values listed here are used to roughly estimate the minimum hub diameter. If the hub is weakened by boreholes, then the required outer diameter of the hub should be increased by the respective diameter of the drill hole.



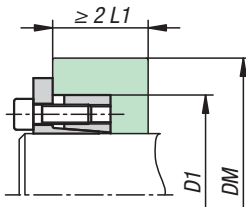
C=1

To calculate the minimum hub diameter, the following formula applies:

$$DM \geq D1 \cdot K$$

D1 = outer diameter keyless locking coupling (mm)

K = factor (see table)



C=0,8

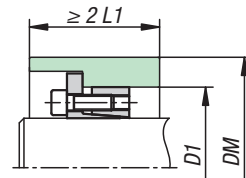
If plant K is not specified in the table, then the following formula applies:

$$K = \sqrt{\frac{\sigma_{0,2} + (C \cdot PN)}{\sigma_{0,2} - (C \cdot PN)}} \text{ (mm)}$$

$\sigma_{0,2}$ = yield point of the hub material (N/mm²)

c = factor for hub form

PN = surface pressure on hub (N/mm²)



C=0,6

Sample calculation:

shaft diameter D=40 mm

hub material GGG40

yield point $\sigma_{0,2}$ = 250 N/mm²

Selected keyless locking coupling:

23360-4090 keyless locking coupling form G

with D = 40 mm, D1 = 90 mm and PN = 139 N/mm²

hub width and form accordingly C = 1

factor K from table = 1.88 (approximate value from table PN = 140 n/mm² with C = 1)

DM = 90 mm • 1.88 = **169.2 mm**

For clamping connections with hollow shafts, the required internal diameter of the hollow shaft is calculated with the following formula:

$$DW_{\text{innen}} \leq D \cdot \sqrt{\frac{\sigma_{0,2 \text{ shaft}} - 2 \cdot PW \cdot 0,8}{\sigma_{0,2 \text{ shaft}}}} \text{ (mm)}$$

DW_{internal} = hollow shaft internal diameter (mm)

D = internal diameter of the clamping set (mm)

$\sigma_{0,2 \text{ shaft}}$ = yield point of the shaft material (N/mm²)

PW = surface pressure on shaft (N/mm²)

Calculating the minimum hub diameter

Table for factor K												
		σ 0.2 yield point N/mm ²										
		150	180	200	220	250	270	300	350	400	450	600
		hub materials										
PN N/mm ²	Hub form C	GG20	GG25 GS38	GG30 GTS35	GS45 St 37-2	GGG40 GS52	St 50-2 C35	GGG50 GS60 St 60-2	GGG60 GS62 St 70-2	GGG70 GS70 C60		
60	C = 0,6	128	125	120	118	115	114	112	110	109	108	106
	C = 0,8	139	130	124	123	122	120	118	115	112	111	108
	C = 1	152	142	136	132	128	125	122	118	116	114	110
65	C = 0,6	130	125	122	120	118	115	113	111	110	109	107
	C = 0,8	144	135	130	128	124	122	120	116	114	112	109
	C = 1	160	145	140	135	130	128	124	120	118	116	112
70	C = 0,6	134	126	124	122	118	116	115	112	111	110	107
	C = 0,8	148	138	134	130	125	123	120	118	115	113	110
	C = 1	165	150	145	140	134	130	126	122	120	117	113
75	C = 0,6	130	128	125	123	120	118	116	114	112	111	108
	C = 0,8	152	142	136	132	128	125	122	118	116	114	111
	C = 1	174	155	148	142	136	133	130	125	120	118	113
80	C = 0,6	139	131	128	125	121	120	118	115	113	111	108
	C = 0,8	158	145	139	135	130	127	124	120	118	115	111
	C = 1	181	161	153	146	139	136	131	126	122	120	114
85	C = 0,6	142	134	130	127	123	121	119	116	114	112	109
	C = 0,8	163	149	142	138	132	129	126	122	119	116	112
	C = 1	190	167	157	150	142	139	134	128	124	121	115
90	C = 0,6	146	136	132	128	125	122	120	117	115	113	109
	C = 0,8	169	153	146	140	134	131	128	123	120	118	113
	C = 1	200	173	162	154	146	141	136	130	126	122	116
95	C = 0,6	149	139	134	130	126	124	121	118	115	114	110
	C = 0,8	175	157	149	143	137	134	130	125	121	119	114
	C = 1	211	180	168	159	149	144	139	132	127	124	117
100	C = 0,6	153	141	136	132	128	125	122	119	116	114	111
	C = 0,8	181	161	153	146	139	136	131	126	122	120	114
	C = 1	224	187	173	163	153	148	141	134	129	125	118
105	C = 0,6	156	144	139	134	129	127	124	120	117	115	111
	C = 0,8	188	166	156	150	142	138	133	128	124	121	115
	C = 1	238	195	179	168	156	151	144	136	131	127	119
110	C = 0,6	160	147	141	136	131	128	125	121	118	116	112
	C = 0,8	196	171	160	153	144	141	135	129	125	122	116
	C = 1	255	204	186	173	160	154	147	138	133	128	120
115	C = 0,6	164	150	143	136	133	130	126	122	119	117	112
	C = 0,8	204	176	164	156	147	143	137	131	126	123	117
	C = 1	275	213	193	179	164	158	150	141	134	130	121
120	C = 0,6	169	153	146	140	134	131	128	123	120	118	113
	C = 0,8	213	181	169	160	150	145	139	133	128	124	118
	C = 1	300	224	200	184	169	161	153	143	136	131	122
125	C = 0,6	173	156	148	143	136	133	129	124	121	118	113
	C = 0,8	224	187	173	163	153	148	141	134	129	125	118
	C = 1	332	235	208	191	173	165	156	145	138	133	124
130	C = 0,6	178	159	151	145	138	135	130	125	122	119	114
	C = 0,8	235	193	178	167	156	150	144	136	130	127	119
	C = 1	374	249	217	197	178	169	159	148	140	135	125
135	C = 0,6	183	162	154	147	140	136	132	127	123	120	115
	C = 0,8	248	200	183	171	159	153	146	138	132	128	120
	C = 1	436	265	227	204	183	173	162	150	142	136	126
140	C = 0,6	188	166	156	150	142	138	133	128	124	121	115
	C = 0,8	263	207	188	175	162	155	148	139	133	129	121
	C = 1	539	283	238	212	188	178	166	153	144	138	127
145	C = 0,6	194	169	159	152	144	140	135	129	125	122	116
	C = 0,8	280	215	194	180	165	158	150	141	135	130	122
	C = 1	788	305	250	221	194	182	169	155	146	140	128
150	C = 0,6	200	173	162	154	146	141	136	130	126	123	116
	C = 0,8	300	224	200	184	169	161	153	143	136	131	123
	C = 1	-	332	265	230	200	187	173	158	148	141	129
155	C = 0,6	206	177	165	157	148	143	138	131	127	124	117
	C = 0,8	325	233	206	189	172	165	155	145	138	133	123
	C = 1	-	366	280	240	206	192	177	161	151	143	130
160	C = 0,6	213	181	169	160	150	145	139	133	128	124	118
	C = 0,8	355	243	213	194	176	167	158	147	139	134	124
	C = 1	-	412	300	252	213	198	181	164	153	145	131
165	C = 0,6	221	186	172	162	152	147	141	134	129	125	118
	C = 0,8	396	255	221	200	180	171	160	149	141	135	125
	C = 1	-	480	323	265	221	204	186	167	155	147	133