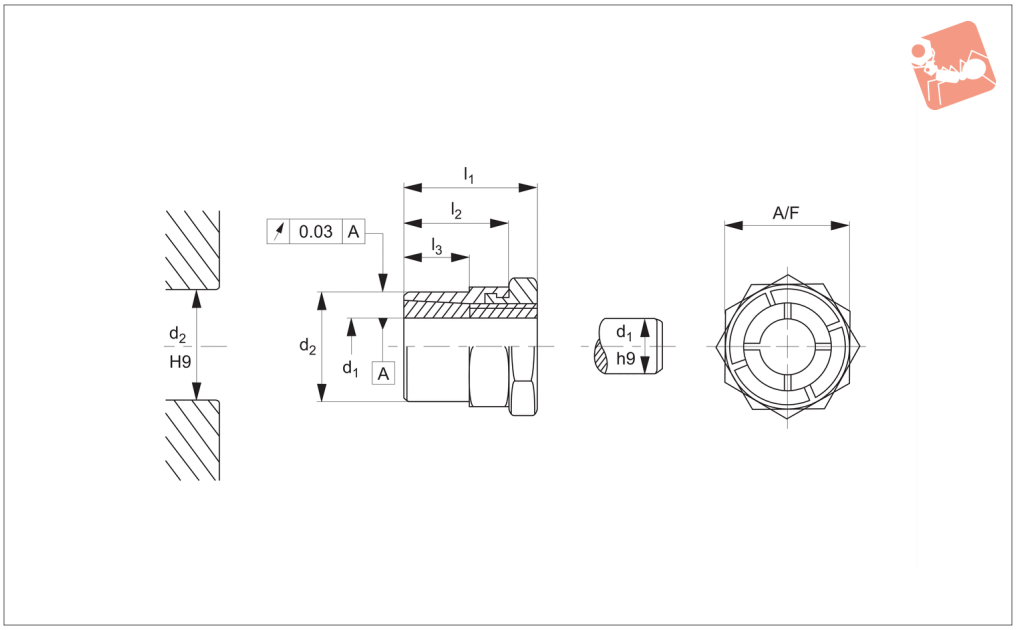
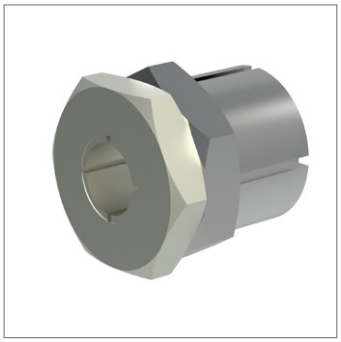




38420

Material
Inner part: steel, nickel plated.
Outer part: steel, galvanised.
Nut: steel, nickel-plated.

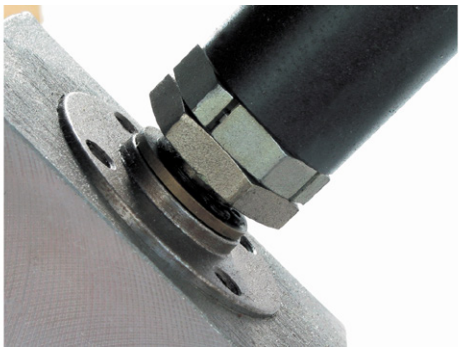
Technical Notes
Ta = tightening torque of nut.
M = transferable torque.
Fa = transferable thrust load.
pw = surface pressure of shaft.
pn = surface pressure of hub.
Rotational accuracy is 0,3mm.
Please note special fork wrench is required for mounting, wrench thickness is equal to l2 - l3.

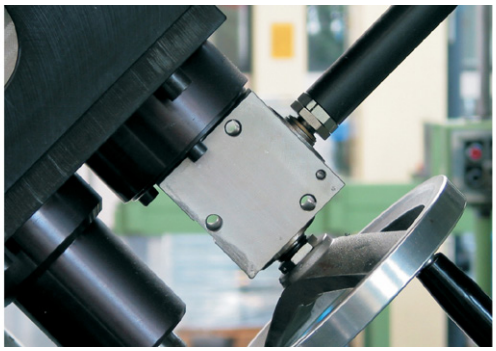
Tips
These self-centering and non-floating tapered shaft hubs are used to easily and effectively achieve shaft/hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. The lock nut enables locking of the shaft-hub joint, where free rotating shafts are used.

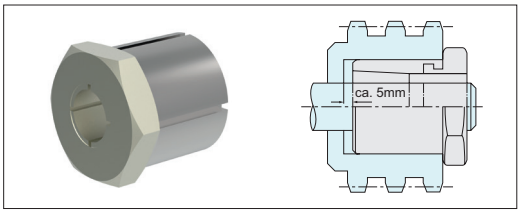
Order No.	Finish	d_1	d_2	l_1	l_2	l_3	A/F	M Nm max.	pn N/mm² max.	pw N/mm² max.	Ta Nm max.	F_a kN max.	Weight g
38420.W0105	With Lock Nut	5	12	19	15	9	14	10.1	119	264	9.9	4.0	18
38420.W0106	With Lock Nut	6	12	19	15	9	14	12.1	119	220	9.9	4.0	17
38420.W0108	With Lock Nut	8	14	22	17	11	16	23.4	121	179	16.9	5.8	23
38420.W0109	With Lock Nut	9	18	24	19	12	22	43.7	127	245	34.9	9.7	47
38420.W0110	With Lock Nut	10	18	24	19	12	22	48.6	127	221	34.9	9.7	46
38420.W0111	With Lock Nut	11	20	24	19	12	22	59.9	128	225	43.8	10.9	47
38420.W0112	With Lock Nut	12	20	24	19	12	22	65.3	128	206	43.8	10.9	45
38420.W0114	With Lock Nut	14	24	28	22	15	27	93.0	107	178	65.0	13.3	78
38420.W0115	With Lock Nut	15	24	28	22	15	27	99.0	107	166	65.0	13.3	75
38420.W0116	With Lock Nut	16	24	28	22	15	27	106.0	107	156	65.0	13.3	70
38420.W0118	With Lock Nut	18	30	36	27	17	36	223.0	145	224	161.0	24.8	179
38420.W0119	With Lock Nut	19	30	36	27	17	36	235.0	145	212	161.0	24.8	169
38420.W0120	With Lock Nut	20	30	36	27	17	36	248.0	145	201	161.0	24.8	213
38420.W0122	With Lock Nut	22	38	41	30	20	46	349.0	122	197	250.0	31.8	341
38420.W0124	With Lock Nut	24	38	41	30	20	46	381.0	122	180	250.0	31.8	320
38420.W0125	With Lock Nut	25	38	41	30	20	46	397.0	122	173	250.0	31.8	310
38420.W0128	With Lock Nut	28	42	44	33	23	50	565.0	123	174	355.0	40.4	370
38420.W0130	With Lock Nut	30	42	44	33	23	50	605.0	123	162	355.0	40.4	348
38420.W0132	With Lock Nut	32	50	51	38	28	55	764.0	112	166	490.0	47.8	555
38420.W0135	With Lock Nut	35	50	51	38	28	55	836.0	112	151	490.0	47.8	501
38420.W0814	Special Fork Wrench	-	-	-	-	-	14	-	-	-	-	-	45
38420.W0816	Special Fork Wrench	-	-	-	-	-	16	-	-	-	-	-	72
38420.W0822	Special Fork Wrench	-	-	-	-	-	22	-	-	-	-	-	195
38420.W0827	Special Fork Wrench	-	-	-	-	-	27	-	-	-	-	-	195
38420.W0836	Special Fork Wrench	-	-	-	-	-	36	-	-	-	-	-	428
38420.W0846	Special Fork Wrench	-	-	-	-	-	46	-	-	-	-	-	610
38420.W0850	Special Fork Wrench	-	-	-	-	-	50	-	-	-	-	-	870
38420.W0855	Special Fork Wrench	-	-	-	-	-	55	-	-	-	-	-	1125

Tapered Shaft Hubs
with lock nut

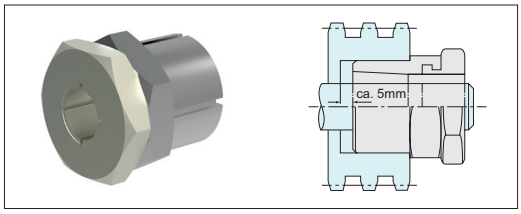
Order No.	Finish	d_1	d_2	l_1	l_2	l_3	A/F	M Nm max.	pn N/mm² max.	pw N/mm² max.	Ta Nm max.	F_a kN max.	Weight g
38420.W0865	Special Fork Wrench	-	-	-	-	-	65	-	-	-	-	-	1295



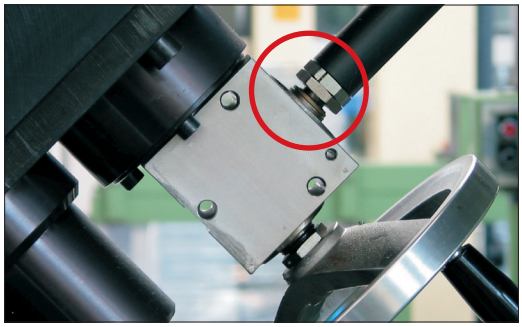


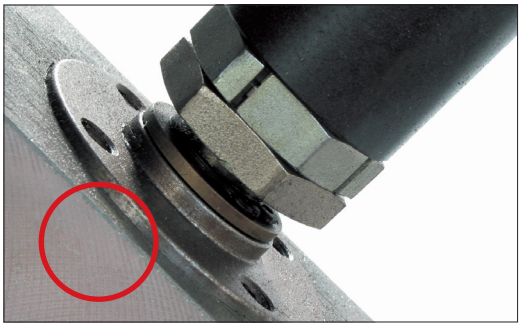


Tapered shaft hub with hexagon nut



Tapered shaft hub with hexagon nut and lock nut





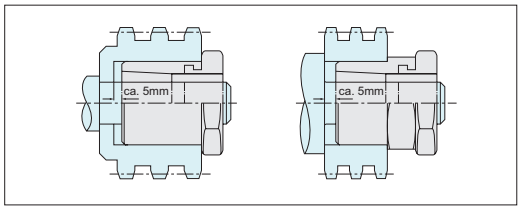
Applications

By using tapered shaft hubs, sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently installed.

Tapered shaft hubs are available with or without lock nuts.

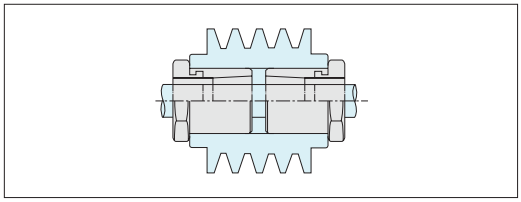
No Axial Shift

If, on mounting, the hub sits close to a collar, an axial offset is not possible. In this case, only 60% of the forces mentioned in the charts can be transmitted.



Two Tapered Shaft Hubs in One Hub

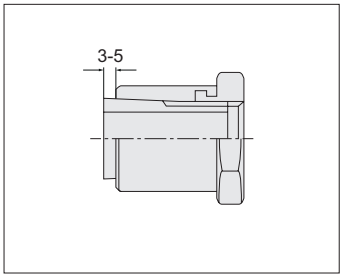
When using this method, the tapered shaft hub which is tightened first transmits 100% of the forces mentioned in the charts. When tightening the second tapered shaft hub, an axial offset of the hub is not possible. Therefore, this tapered shaft hub is able to transmit only 60% of the forces.



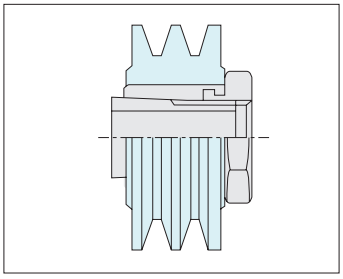
Assembly and Disassembly

Assembly

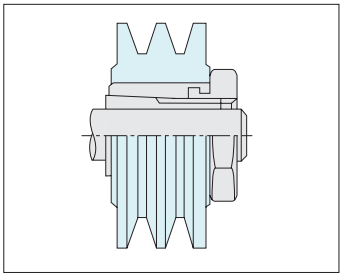
The contact surface of the shaft and the hub must be free from oil and dirt.



1. Rotate nut to the left until the inner part protrudes approx. 3-5mm over the outer.



2. Install tapered shaft hub in the hub hole.



3. Slightly tighten the nut when located in the desired position. Compensate the axial offset thus produced with a soft-face mallet. Tighten the tapered shaft hub.

Disassembly

1. Release tapered shaft hub by turning the nut to the left until the inner part protrudes approx. 3-5mm over the outer part.

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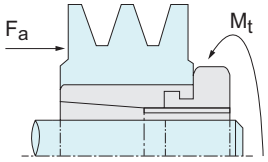
Simultaneous Exposure to Different Forces



If torque (M_t) and axial forces (F_a) are transmitted simultaneously, a resultant total torque (M_r) is obtained which must be less than or equal to the maximum torque (M_{max}) indicated in the charts. ($M_r \leq M_{max}$).

$$M_r = \sqrt{M_t^2 + \left(F_a \times 2 \times \frac{d_1}{1000}\right)^2 \times \nu}$$

M_r = Resultant total torque
M_t = Torque
F_a = Axial force
d_1 = Shaft diameter
ν = Safety factor

Example:

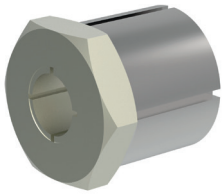
Shaft hub 38420.W0125

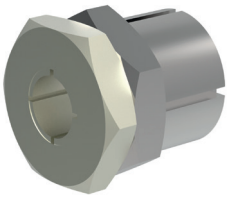
M_t = 150Nm
F_a = 5kN
d_1 = 25mm
ν = 2

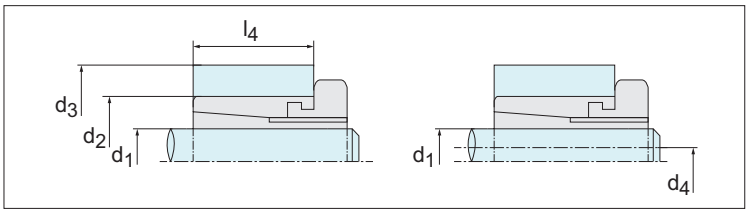
$$M_r = \sqrt{150^2 Nm^2 + \left(5000N \times 2 \times \frac{25mm}{1000mm/m}\right)^2 \times 2} = 325Nm$$

A maximum torque (M_{max}) of 520 Nm is transmitted by the tapered shaft hub 38420.W0125. The forces can be transmitted because M_r (325 Nm) is less than M_{max}.

Outside Diameter of Hub and Inside Diameter to Hollow Shaft







When fitting tapered shaft hubs, the outside diameter of the hub and the inside diameter of the hollow shaft have to be considered.

Smallest possible outside diameter of hub

$$d_3 \geq d_2 \times \sqrt{\frac{R_e + P_N \times C_N}{R_e - P_N \times C_N}} \quad [mm]$$

Largest possible inside diameter of hollow shaft

$$d_4 \leq d_1 \times \sqrt{\frac{R_e - 2P_W}{R_e\ (R_p)}} \quad [mm]$$

d_1 = Shaft diameter
d_2 = Hub hole
d_3 = Outside diameter of hub
d_4 = Inside diameter of hollow shaft
R_e = Apparent yielding point
$R_{p0,2}$ $R_{p0,1}$ = Permanent elongation limit

P_N = Surface pressure hub
P_W = Surface pressure shaft
C_N = Factor [is "1", if the hub length is ≥ the fitting length of the tapered shaft hub ($L_N \geq L_2$)]

Example:

Tapered shaft hub 38400.W0025, hub material GG25;

$R_{p0,1}$ = 165Nmm²
C_N = 1

$$d_3 \geq = 42mm \times \sqrt{\frac{165Nmm^2 + 103Nmm^2 \times 1}{165Nmm^2 - 103Nmm^2 \times 1}} \geq 87{,}4mm$$

Tapered shaft hub 38400.W0025, hub material CK45;

R_e = 380Nmm²
C_N = 1

$$d_4 \leq 25mm \times \sqrt{\frac{380Nmm^2 - 2 \times 174Nmm^2}{380Nmm^2}} \leq 7{,}2mm$$

Material Chart

	Material									
	St 37-2 Ust 37-2	St 50-2	Ck 35	Ck 45	11 SMn 30 11SMn Pb 30	GG 15	GG 20	GG 25	GGG-40	AlMg 3 F 25
	Minimum strength values in N/mm²									
Diameter	**Re**	**Re**	**Re**	**Re**	**Re**	**Rp 0,1**	**Rp 0,1**	**Rp 0,1**	**Rp 0,2**	**Re**
$16 < d_1 \leq 40$	225	285	320	380	375	90	130	165	250	180
$40 < d_1 \leq 100$	205	265	260	300	245	90	130	165	250	180

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