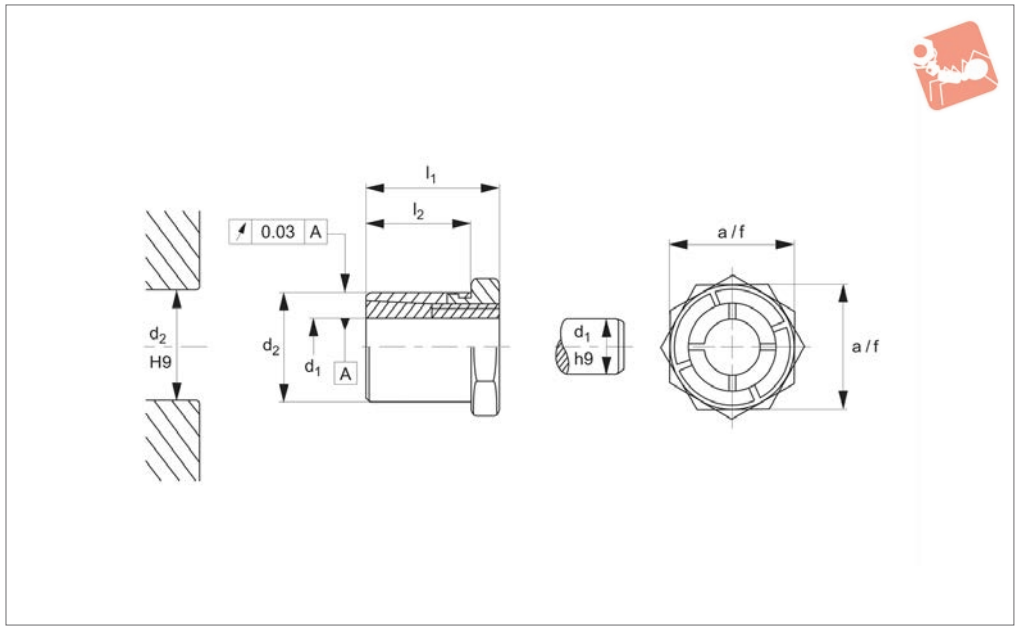
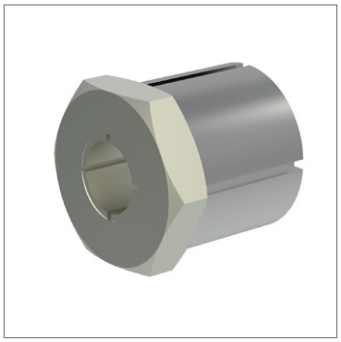




38400

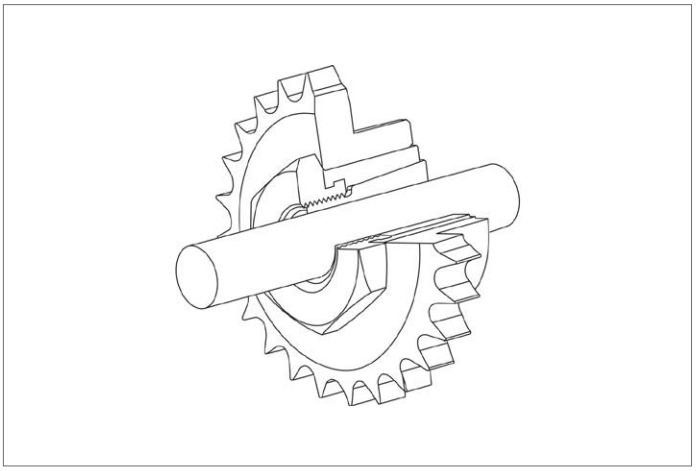
Material
Inner part: steel, blackened. Outer part: steel, galvanised. Nut: steel, nickel-plated.

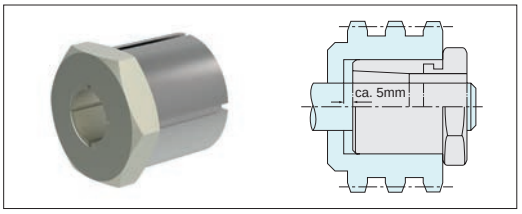
Technical Notes
Ta = tightening torque of nut.
M = transferable torque.
Fa = transferable thrust load.
pw = surface pressure of shaft.
pn = surface pressure of hub.
The rotational accuracy is 0,03mm.
Please refer to technical pages for mounting instructions.

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. For special fork wrench see part 38420. W0814- .W0865.

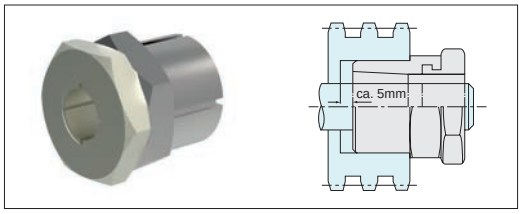
Order No.	Finish	d_1	d_2	l_1	l_2	A/F	M Nm max.	pn N/mm² max.	pw N/mm² max.	Ta Nm max.	F_a kN max.	Weight g
38400.W0005	Without Lock Nut	5	14	19	15	14	10.1	96	264	9.9	4.0	20
38400.W0006	Without Lock Nut	6	14	19	15	14	12.1	96	220	9.9	4.0	19
38400.W0008	Without Lock Nut	8	16	22	17	16	23.4	91	179	16.9	5.8	26
38400.W0009	Without Lock Nut	9	20	24	19	22	43.7	115	245	34.9	9.7	47
38400.W0010	Without Lock Nut	10	20	24	19	22	48.6	115	221	34.9	9.7	46
38400.W0011	Without Lock Nut	11	22	24	19	22	59.9	117	225	43.8	10.9	51
38400.W0012	Without Lock Nut	12	22	24	19	22	65.3	117	206	43.8	10.9	49
38400.W0014	Without Lock Nut	14	26	28	22	27	93.0	99	178	65.0	13.3	83
38400.W0015	Without Lock Nut	15	26	28	22	27	99.0	99	166	65.0	13.3	78
38400.W0016	Without Lock Nut	16	26	28	22	27	106.0	99	156	65.0	13.3	73
38400.W0018	Without Lock Nut	18	35	36	27	36	223.0	125	224	161.0	24.8	201
38400.W0019	Without Lock Nut	19	35	36	27	36	235.0	125	212	161.0	24.8	189
38400.W0020	Without Lock Nut	20	35	36	27	36	248.0	125	201	161.0	24.8	186
38400.W0022	Without Lock Nut	22	42	41	30	46	349.0	110	197	250.0	31.8	346
38400.W0024	Without Lock Nut	24	42	41	30	46	381.0	110	180	250.0	31.8	326
38400.W0025	Without Lock Nut	25	42	41	30	46	397.0	110	173	250.0	31.8	315
38400.W0028	Without Lock Nut	28	47	44	33	50	565.0	110	174	355.0	40.4	403
38400.W0030	Without Lock Nut	30	47	44	33	50	605.0	110	162	355.0	40.4	378
38400.W0032	Without Lock Nut	32	55	51	38	55	764.0	102	166	490.0	47.8	632
38400.W0035	Without Lock Nut	35	55	51	38	55	836.0	102	151	490.0	47.8	571
38400.W0038	Without Lock Nut	38	62	58	43	65	1179.0	111	159	720.0	62.1	897
38400.W0040	Without Lock Nut	40	62	58	43	65	1241.0	111	151	720.0	62.1	842

Tapered Shaft Hubs
non-locking

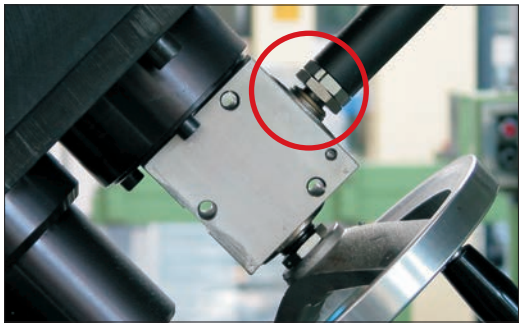


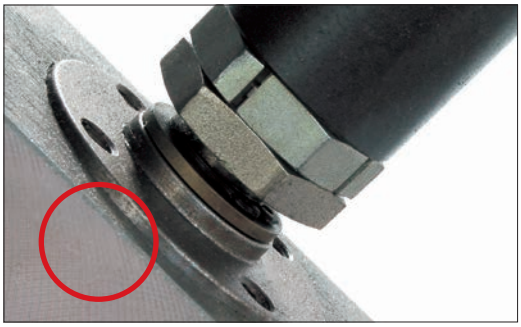


Tapered shaft hub with hexagon nut



Tapered shaft hub with hexagon nut and lock nut





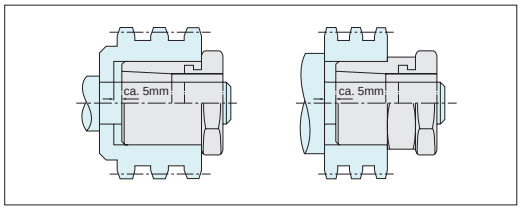
Applications

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.

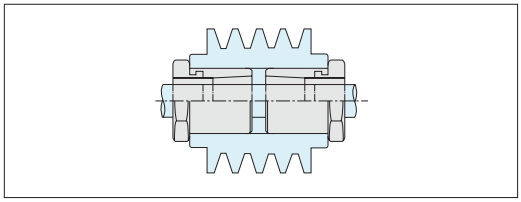
No Axial Shift

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.

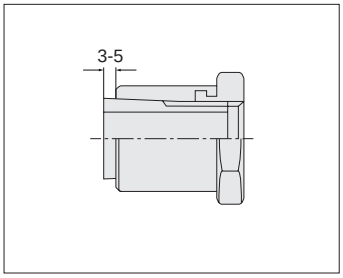


Two Tapered Shaft Hubs in One Hub

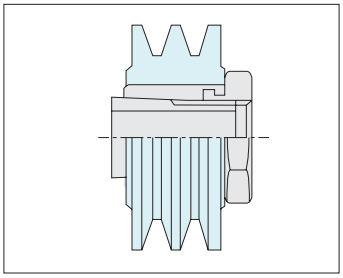
When using this method, the tapered shaft hub which is tightened first transmits 100% of the forces mentioned in the charts. When tightening the second tapered shaft hub, an axial offset of the hub is not possible. Therefore, this tapered shaft hub is able to transmit only 60% of the forces.



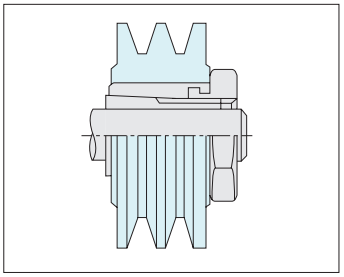
Assembly and Disassembly



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.

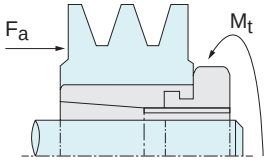
Assembly

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

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.

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. ($M_r \leq M_{max}$).

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

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

Example:

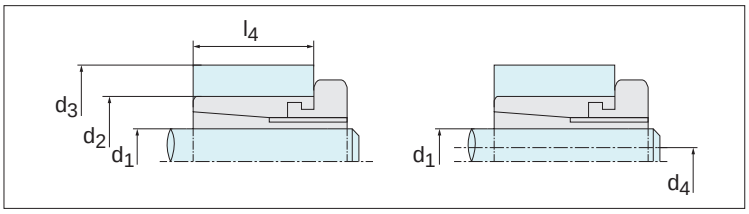
Shaft hub 38420.W0125

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

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

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 / largest possible inside diameter of hollow shaft

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

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

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 ≤ 40	225	285	320	380	375	90	130	165	250	180
40 < d_1 ≤ 100	205	265	260	300	245	90	130	165	250	180