

## Tightening torques

Here you will find an overview of tightening torques of clamping tools.

The tightening torque is the force with which the screw connection is tightened by means of a tool during the assembly of screws. This torque is transferred to the bolt or the corresponding nut with an adjustable torque spanner suitable for this purpose. Refer to the tightening torque table / torque table below for the corresponding values of the various bolt sizes and clamping nuts.

The tightening torque is measured in Newton metres (Nm). 1 Nm corresponds to pulling with a lever of 1 metre length, with a force of 1 Newton = 100 grams.

TIP: To tighten a screw connection with the correct torque, a torque spanner should be used. You will also find torque spanners and torque spanner inserts for tightening bolts and clamping nuts in our product range – check individual catalogues for details.

### Pull studs

Recommended tightening torque for mounting the pull studs / tightening bolts:

<i>Pullstud (Thread)</i>	<i>TQX (Torque)</i>
SK / BT / ISO 30 (M12)	20 Nm
SK / BT / ISO 40 (M16)	50 Nm
SK / BT / ISO 50 (M24)	100 Nm

Higher tightening torques can lead to deformation of the steep taper.

### Torque for clamping Weldon milling cutters in DIN 6359 milling cutter holders

<b>Diameter</b>	<b>Clamping screw</b>	<b>TQX (Torque)</b>
∅ 6 mm	M 6   SW 3	10 Nm
∅ 8 mm	M 8   SW 4	10 Nm
∅ 10 mm	M 10   SW 5	16 Nm
∅ 12 mm	M 12   SW 6	28 Nm
∅ 14 mm	M 12   SW 6	28 Nm
∅ 16 mm	M 14   SW 6	42 Nm
∅ 18 mm	M 14   SW 6	42 Nm
∅ 20 mm	M 16   SW 8	50 Nm

∅ 25 mm	M 18 × 2   SW 10	60 Nm
∅ 32 mm	M 20 × 2   SW 10	72 Nm
∅ 40 mm	M 20 × 2   SW 10	72 Nm
∅ 50 mm	M 24 × 2   SW 12	90 Nm
∅ 63 mm	M 24 × 2   SW 12	90 Nm

### ER-collet chuck

#### Chucks for collets ISO 15488 (DIN 6499) ER system

<i>Typ</i>	<i>Thread clamping nut</i>	<i>TQX (Torque)</i>
ER 16	M22 × 1,5	50 Nm
ER 20	M25 × 1,5	75 Nm
ER 25	M32 × 1,5	85 Nm
ER 32	M40 × 1,5	105 Nm
ER 40	M50 × 1,5	150 Nm

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### SCollet chuck ER type Mini

<i>Typ</i>	<i>Thread clamping nut</i>	<i>TQX (Torque)</i>
ER 11 Min	M13 × 0,75	18 Nm
ER 16 Mini	M19 × 1	28 Nm

### Clamping nuts ISO 15488 (DIN 6499) system ER, hexagon nut

<i>Typ</i>	<i>Thread clamping nut</i>	<i>DRVS</i>	<i>TQX (Torque)</i>
4008E   ER 11	M14 × 0,75	17	30 Nm
426E   ER 16	M22 × 1,5	25	40 Nm
428E   ER 20	M25 × 1,5	30	60 Nm
430E   ER 25	M32 × 1,5	38	60 Nm

### Collet chuck | Collet chuck for collets DIN 6388 (ISO 10897)

#### System OZ ( Ortlieb collet chuck )

<b>Typ</b>	<b>Thread clamping nut</b>	<b>TQX (Torque)</b>
415E   OZ 16	M33 × 1,5	85 Nm
462E   OZ 25	M48 × 2	140 Nm
467E   OZ 32	M60 × 2,5	170 Nm

### Collets

<b>Typ</b>	<b>Thread clamping nut</b>	<b>Clamping diameter</b>	<b>TQX (Torque)</b>
4004E   ER 8	M10 × 0,75	1,0 - 2,5	5 Nm
4004E   ER 8	M10 × 0,75	3,0 - 5,0	8 Nm
4008E   ER 11	M13 × 0,75	1,0 - 2,5	13 Nm
4008E   ER 11	M13 × 0,75	3,0 - 7,0	25 Nm
426E   ER 16	M22 × 1,5	1,0 - 4,5	30 Nm
426E   ER 16	M22 × 1,5	5,0 - 10,0	50 Nm
428E   ER 20	M25 × 1,5	1,0 - 5,5	45 Nm
428E   ER 20	M25 × 1,5	6,0 - 13,0	75 Nm
430E   ER 25	M32 × 1,5	1,0 - 6,5	55 Nm
430E   ER 25	M32 × 1,5	7,0 - 16,0	85 Nm
470E   ER 32	M40 × 1,5	2,0 - 6,5	70 Nm
470E   ER 32	M40 × 1,5	7,0 - 20,0	105 Nm
472E   ER 40	M50 × 1,5	3,0 - 7,5	100 Nm
472E   ER 40	M50 × 1,5	8,0 - 26,0	150 Nm

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**Precision collet chuck ER for collets ISO 15488 (DIN 6499) System ER**

<i>Article Number</i>	<i>Abmessung / Typ</i>	<i>THSZMS (Thread)</i>	<i>TQX (Torque)</i>
110.P2.20	470 E   ER 32	M40 × 1,5	170 Nm

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**Collet chuck System KPS**

<i>Typ</i>	<i>THSZMS (Thread)</i>	<i>TQX (Torque)</i>
KPS 10	M21,5 × 1,0	40 Nm
KPS 16	M32,0 × 1,5	70 Nm

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**Cutter tightening screws for cutter arbors (combination arbors and cross groove arbors) DIN 6367**

**Socket head cap screws DIN 6367**

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<i>Article Number</i>	<i>Dimension / Type</i>	<i>THOD (Thread)</i>	<i>TQX (Torque)</i>
102.10.16	16	M8	35
102.10.22	22	M10	75
102.10.27	27	M12	130
102.10.32	32	M16	320
102.10.40	40	M20	620
102.10.50	50	M24	1000
102.10.60	60	M30	2000

**Socket head screws for push-on mandrels DIN 912 / Hexagon socket head screw**

<i>Article Number</i>	<i>Dimension / Type</i>	<i>THOD (Thread)</i>	<i>TQX (Torque)</i>
102.10.161	16	M8	35 Nm
102.10.221	22	M10	70 Nm
102.10.271	27	M12	120 Nm

102.10.321	32	M16	300 Nm
102.10.401	40	M20	500 Nm

### Cap screw for driver blocks for milling arbour holders DIN 2079

<i>Article Number</i>	<i>Dimension / Type</i>	<i>THOD (Thread)</i>	<i>TQX (Torque)</i>
101.11.16	16	M3	4,4 Nm
101.11.22	22	M4	4,4 Nm
101.11.27	27	M4	4,4 Nm
101.11.32	32	M5	8,7 Nm
101.11.40	40	M5	36 Nm
101.11.60	60	M12	120 Nm

### CNC drill chuck

<b>Size</b>	<b>0,5 - 8 mm</b>	<b>1 - 13 mm</b>	<b>2,5 - 16 mm</b>
Torque	10 Nm	15 Nm	15 Nm
Clamping force	30 Nm	40 Nm	40 Nm

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To use the CNC drill chuck, a tightening torque of 10 Nm or 15 Nm is sufficient on the hexagonal cross-handle spanner. This results in a holding torque of 30 Nm or 40 Nm on the clamped tool [values measured on a cleaned carbide pin]. The higher holding torques that can be achieved with the CNC drill chucks should be seen as additional safety and are not necessary for normal use.

#### Note:

Do not use an extension or tightening aid. If the tightening torque exceeds 15 Nm (at 0.5-8 = 10 Nm), the bevel gear can be destroyed. In this case, the pinion is the predetermined breaking point to prevent major damage to the drill chuck.

### Milling chucks

<b>Size</b>	<b>20mm</b>	<b>25mm</b>	<b>32mm</b>
Torque	50-70 Nm	70-90 Nm	80-100 Nm
Clamping force	780 Nm	1150 Nm	2000 Nm

### Milling cutter holders for screw-in milling cutters

<b>THOD (Thread)</b>	<b>TQX (Torque)</b>
M6	10 Nm
M8	25 Nm
M10	40 Nm
M12	50 Nm
M16	60 Nm

### Hydraulic expansion chuck

<b>SpannØ</b>	<b>Torque</b>	<b>Mindest Einspanntiefe</b>	<b>Zul. Übertragbares Drehmoment bei Schaft Kleinmaß h6</b>	<b>Toleranz des Schaftwerkzeuge</b>	<b>Max. Drehzahl [min-1]</b>	
					LPR = 125 mm	LPR > 125 mm
[mm]	[Nm]	[mm]	[Nm]			
6	10	27	12	h6	40.000	20.000
8	10	27	30	h6	40.000	20.000
10	10	31	40	h6	40.000	20.000
12	10	36	70	h6	40.000	20.000
14	10	36	100	h6	40.000	20.000
16	10	39	135	h6	40.000	20.000
18	10	39	180	h6	40.000	20.000
20	10	41	220	h6	40.000	20.000
25	10	47	500	h6	20.000	10.000
32	10	51	700	h6	20.000	10.000

## Cooling lubricant pipe with threaded bushing for hollow taper shanks

Tightening torques according to ISO 22402 (DIN 69895)

<i>Dimension / Type</i>	<i>TQX (Torque)</i>
HSK 32	7 Nm
HSK 40	11 Nm
HSK 50	15 Nm
HSK 63	20 Nm
HSK 80	25 Nm
HSK 100	30 Nm

## WES - Quick-change insert with safety coupling

<b>Thread</b>	<b>Torque[Nm]</b>
M3	1,0
M4	2,3
M5	3,7
M6	6,0
M7	7,5
M8	12,0
M9	14,0
M10	22,0
M11	26,0
M12	32,0
M14	47,0
M16	52,0
M18	82,0
M20	90,0
M22	100,0
M24	135,0



M27	160,0
M30	230,0
M33	250,0
M36	310,0

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