

Operating instruction for the quick-change adapters type:

EM 00 - U
EM 01 - U
EM 03 - U
EM 04 - U
EM 05 - U



EM 01 - U / IKZ
EM 03 - U / IKZ
EM 04 - U / IKZ
EM 05 - U / IKZ



Date of edition: 01.02.2008
Stage of alteration: 2

Please keep this for future use!

Contents:

1	Application range, safety instructions and technical data	3
1.1	Application range, determined use	3
1.2	Safety instructions	5
1.3	Dimensions and technical data	6
1.3.1	Type EM-U	6
1.3.2	Type EM-U/IKZ	7
2	Putting the quick-change adapters into operation.....	8
2.1	Unpacking.....	8
2.2	Insert tool.....	8
2.3	Detach tool	9
2.4	Adjustment of the overload clutch	10
3	Maintenance	12
3.1	Maintenance schedule.....	12
3.2	External cleaning	12
4	Storage when not in use	12
5	Application and choice of other quick-change adapters.....	13
6	Torque reference values for thread cutting	14

Warning signs, symbols

This operating instruction uses the following symbols:

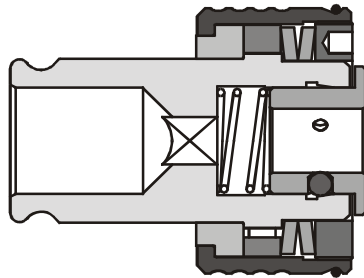


Important:

Marks special instructions, rules and prohibitions which are important in order to avoid any damage.
Please observe these instructions!



Marks application instructions and other useful information.



Sectional view: Quick-change adapter EM-U

1 Application range, safety instructions and technical data

1.1 Application range, determined use

Application of the quick-change adapters:

- These quick-change adapters are designed to be used in the following quick-change tap holders. EMUGE types:
KSN KSN/HD KSN/ICS
SFM-L-DZ
The quick-change adapter size is defined by the tap holder size used.



Important:

The quick-change tap holder must be equipped with a length compensation to make sure the running spindle feed is recognized when the overload clutch compresses without causing any damage.
Exception: The machine is equipped with an integrated length compensation in the machine spindle.

- Tool adaptation acc. to:
DIN dimensions
ISO dimensions
ASME dimensions
- **Type EM-U:**
Application of tools **with** internal coolant-lubricant supply. The max. coolant pressure is defined by the quick-change tap holder used.

Type EM-U/IKZ:

Application of tools **without** internal coolant-lubricant supply (oil channel). The coolant is guided through channels along the tool shank. The max. coolant pressure is defined by the quick-change tap holder used.

- Application range: Production of blind hole threads
- Producing of right- and left-hand threads
- All machining directions

The tool adaptation is executed via a quick-change ball clamping system; the tool is centered at the shank. The torque arising during the thread producing cycle is transferred via the square integrated in the quick-change adapter.

The required clamping diameter is defined by the tool used.

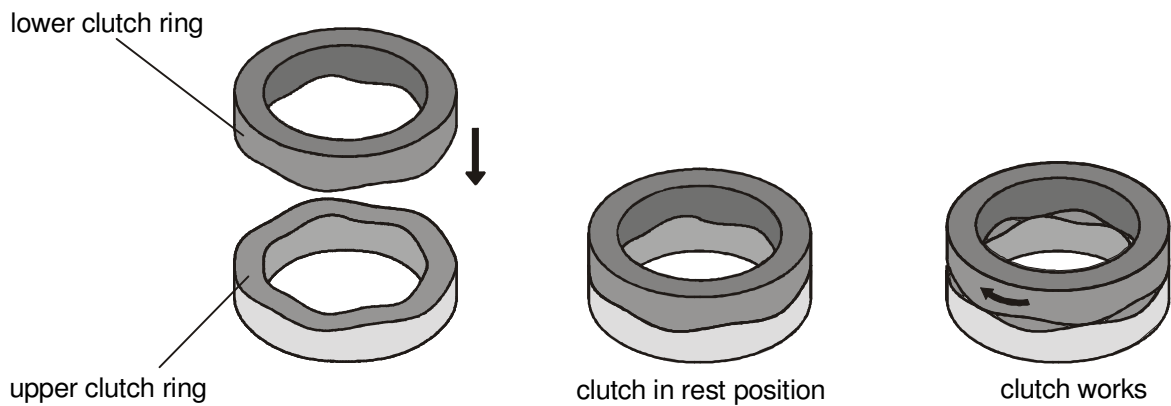
Owing to the quick-change principle, each shank diameter requires a separate quick-change adapter.

Overload clutch:

The integrated overload clutch is adjusted to an average torque value, reference values see chapter 6, page 14.

This torque adjustment can be adjusted to the appropriate machining conditions. Please refer to chapter 2.4, page 10, for adjustment instructions.

Owing to the wear-resistant wave-profile of the clutch disks, see Picture 1, the quick-change adapter can be used for producing right- and left-hand threads and the soft overloading is guaranteed.



Picture 1: Principle of the overload clutch in quick-change adapters EM-U and EM-U/IKZ

The non-determined use exempts the manufacturer from any liability!

1.2 Safety instructions

For all works, ie putting into operation, production, maintenance please observe the details given in the operating instructions.

All relevant safety regulations as well as local instructions are to be observed .

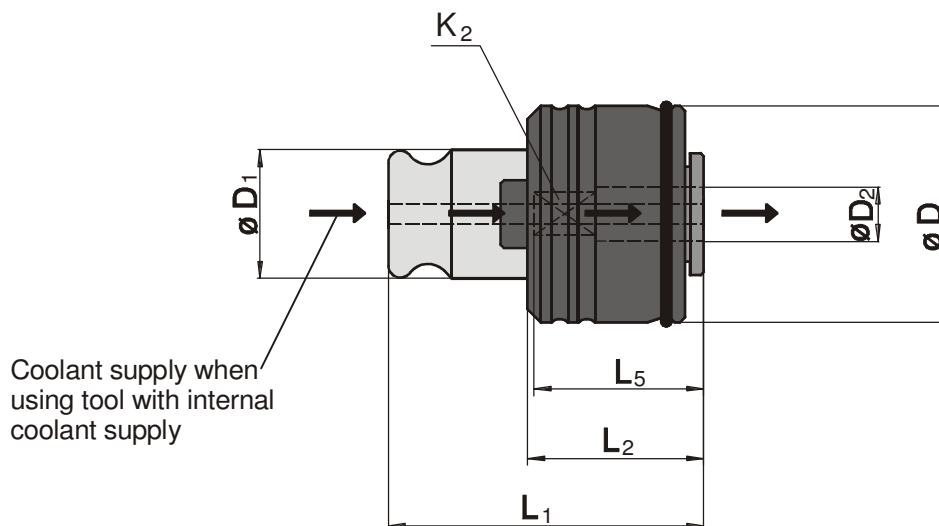
Below please find some basic rules:



- Please wear gloves during tool change to avoid injury.
- Basically change the tool yourself to avoid the sudden start of the spindle caused by mis-operating.
- Hold the tool when loosening the tool clamping to avoid it falling down and damaging the tool and the workpiece.
- There are maximum values for cutting speeds and feeds for every kind of machining. Please observe such data.
- Please observe the maximum tool dimensions.
- Furthermore, the instructions of the tool manufacturers are valid!

1.3 Dimensions and technical data

1.3.1 Type EM-U



Picture 2: Dimensions of the quick-change adapters EM-U

Table 1: Technical data of the quick-change adapters EM-U

Type	Cutting range	Adapter size ¹	$\varnothing D$ [mm]	$\varnothing D_1$ [mm]	$\varnothing D_2$ ² [mm] [inch]	L_1 [mm]	L_2 [mm]	L_5 ³ [mm]	Tool type
EM00-U	M1-M10 M2,2-M9 0- ¹ / ₄	00	24	13	2,5-7 2,8-7,1 0,141-0,255	41,5	22	21-24 21-24 20,8-23,8	DIN ISO ASME
EM01-U	M3-M14 M3,5-M14 0- ⁹ / ₁₆	01	33	19	3,5-11 3,55-11,2 0,141-0,437	47	25	23-29 22-29 22,1-30	DIN ISO ASME
EM03-U	M4,5-M24 M6-M26 ¹ / ₄ - ⁷ / ₈	03	50	31	6-18 6,3-18 0,255-0,700	69	34	38-47 38-48 26,8-43,7	DIN ISO ASME
EM04-U	M14-M36 M14-M36 ⁵ / ₈ -1 ³ / ₈	04	72	48	11-28 11,2-28 0,480-1,125	101	45	56-69 56-70 28,2-64,5	DIN ISO ASME
EM05-U	M22-M48 M24-M48 ⁷ / ₈ -1 ⁷ / ₈	05	95	60	18-36 18-31,5 0,697-1,519	138	75	94-109 95-105 30,8-71,6	DIN ISO ASME

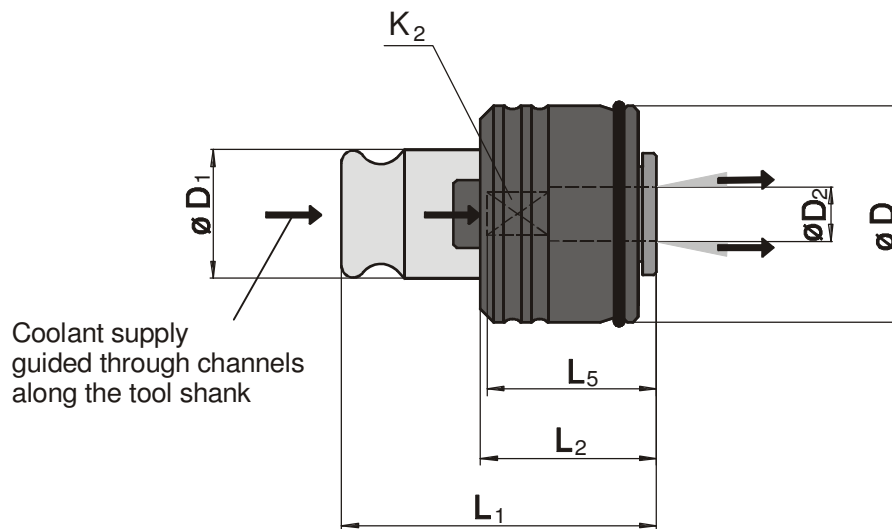
For further dimensions please refer to the EMUGE main catalogue.

¹ Size is defined by the quick-change tap holder size used.

² Clamping diameter is defined by the required tool.

³ Plug-in depth is defined by the tool used.

1.3.2 Type EM-U/IKZ



Picture 3: Dimensions of the quick-change adapters EM-U/IKZ

Table 2: Technical data of the quick-change adapters EM-U/IKZ

Type	Cutting range	Adapter size ⁴	$\varnothing D$ [mm]	$\varnothing D_1$ [mm]	$\varnothing D_2$ ⁵ [mm] [inch]	L_1 [mm]	L_2 [mm]	L_5 ⁶ [mm]	Tool type
EM01-U/IKZ	M3-M14 0- ⁹ / ₁₆	01	33	19	3,5-11 0,141-0,429	47	25	23-29 22,1-30	DIN ASME
EM03-U/IKZ	M4,5-M24 ¹ / ₄ - ⁷ / ₈	03	50	31	6-18 0,251-0,700	69	34	38-47 26,8-43,7	DIN ASME
EM04-U/IKZ	M14-M36 ⁵ / ₈ -1 ³ / ₈	04	72	48	11-28 0,480-1,125	101	45	56-69 28,2-64,5	DIN ASME
EM05-U/IKZ	M22-M48 ⁷ / ₈ -1 ⁷ / ₈	05	95	60	18-36 0,697-1,519	138	75	88-103 30,8-71,6	DIN ASME

For further dimensions please refer to the EMUGE main catalogue.

⁴ Size is defined by the quick-change tap holder size used.

⁵ Clamping diameter is defined by the required tool.

⁶ Plug-in depth is defined by the tool used.

2 Putting the quick-change adapters into operation

2.1 Unpacking

- Take the quick-change adapter from the packing.
- Clean the quick-change adapter with a duster to remove any conservation oil.



Important:

Do not use any aggressive solvents.
Do not use any fibrous materials, ie steel wool.

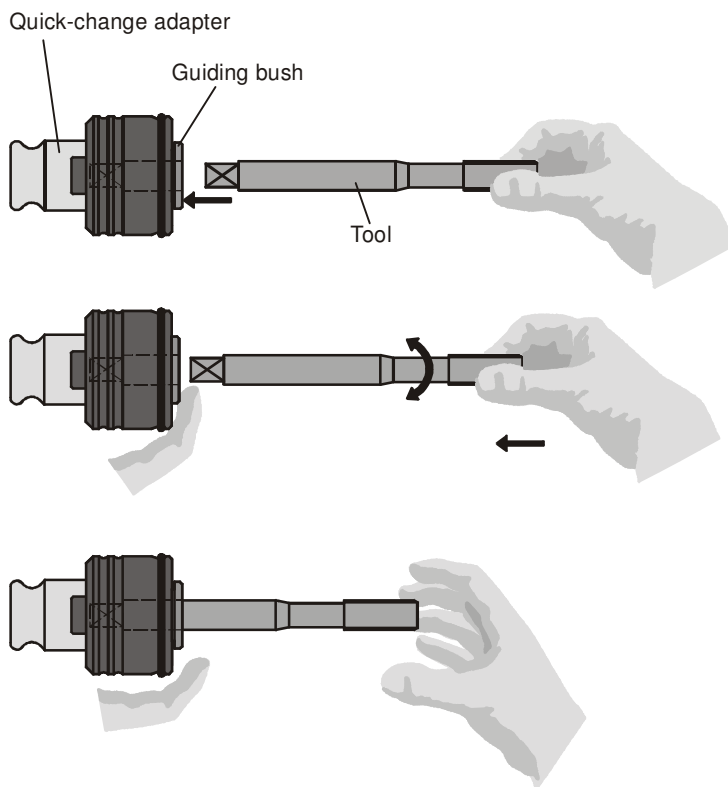
⇒ The quick-change adapter is now ready for operation.

2.2 Insert tool



Important:

Choose appropriate quick-change adapter for the required tool!



1. Press guiding bush back and hold it

2. Push tool into guiding bush.



Bring square into the correct position by turning the tool.

3. Let go of guiding bush

Insert the quick-change adapter into the quick-change tap holder as described in the operating instruction of the used holder.



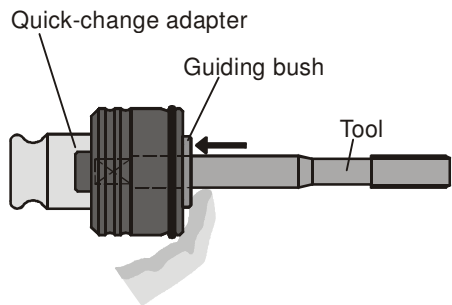
The tool may also be changed according to the above mentioned method if the quick-change adapter is fixed in the quick-change tap holder.



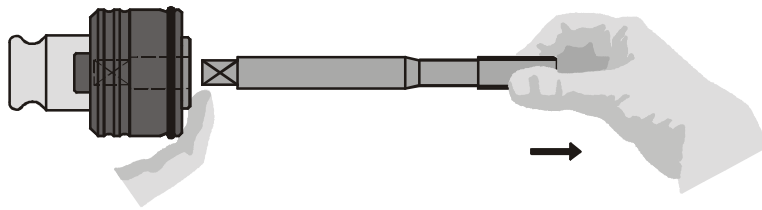
Important:

The tool change must not be executed while the machine spindle rotates!

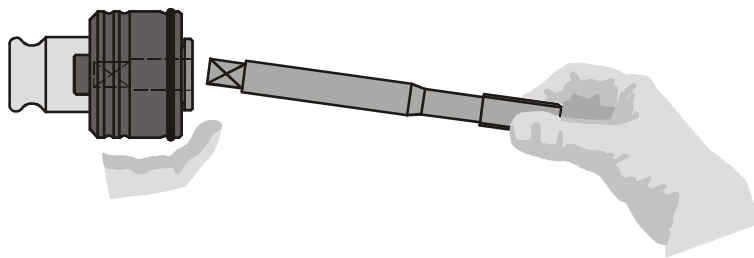
2.3 Detach tool



1. Press guiding bush back and hold it



2. Pull out tool



3. Let go of guiding bush



The tool may also be detached according to the above mentioned method if the quick-change adapter is fixed in the quick-change tap holder.



Important:

The tool change must not be executed while the machine spindle rotates!

2.4 Adjustment of the overload clutch

Basically speaking, the torque to be set depends on:

- Size
- Geometry and coating of the tool
- Workpiece material
- Type and quality of the coolant-lubricant
- Drilled hole diameter

Due to these factors it may be necessary to adapt the torque values from chapter 6, page 14.



Required tool:

Adapter head type AEU
Square pin type VEU

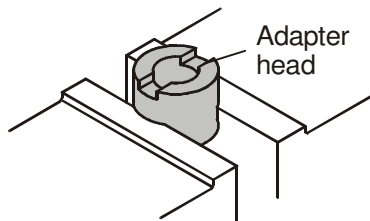
Spanner with pins type VS
Torque wrench type DEU

For the tools please refer to the EMUGE main catalogue, category EM, torque adjustment tools.

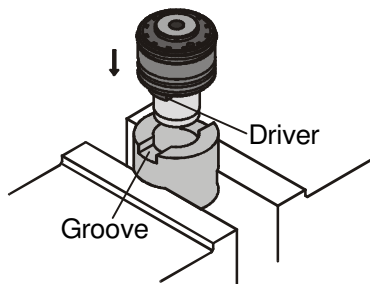


Important:

The torque can only be adjusted if the clutch is in rest position, see picture Picture 1, page 4.



1. Fix adapter head at the clamping faces in the vice

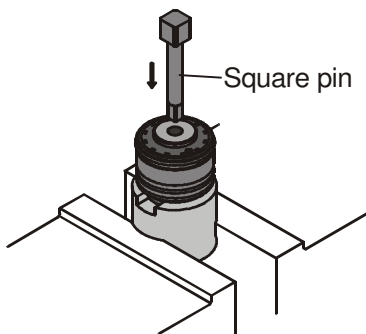


2. Push quick-change adapter into the adapter head



Important:

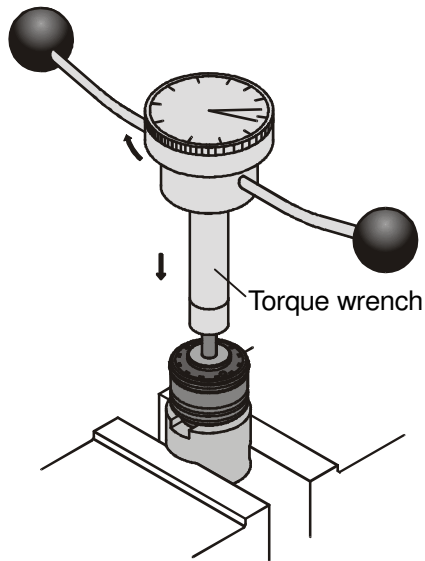
Driver of the quick-change adapter must be located in the groove of the adapter head



3. Clamp square pin in the quick-change adapter
(like tool, see chapter 2.2, page 8)



Use appropriate square pin for quick-change adapter

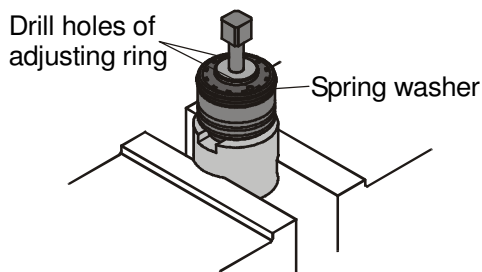


4. Put torque wrench on the square
Adjust the indication to 0-position
Turn torque wrench clock-wise
⇒ Read torque

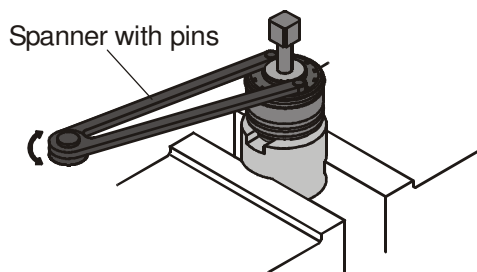


Important:

Turn torque wrench until the
overload clutch has disengaged
and engaged again.
→ Recognizable by a clear click.



5. Remove the spring washer from the grip
sleeve



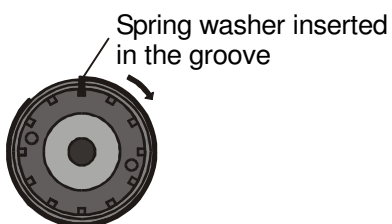
6. Insert spanner with pins into the drill hole
of adjustment ring and turn the ring

Turn right ⇒ Increase of torque
Turn left ⇒ Reduction of torque

7. Check torque by repeating point 4



Repeat points 6 + 4 until the required torque is adjusted



8. Insert the spring washer into the groove.



Spring washer nose must engage
in the nearest notch of the
adjusting ring!



Mount spring washer in direction
of machining

3 Maintenance

3.1 Maintenance schedule

What?	When?	Who?
External cleaning	Periodically depending on the degree of dirt.	Operator

3.2 External cleaning

Clean the quick-change adapter at periodic intervals with a duster, depending on how dirty the quick-change adapter is.

**Important:**

Do not use any aggressive solvents.
Do not use any fibrous materials, ie steel wool.

4 Storage when not in use

If the quick-change adapter is taken out of service, please go through the following steps:

1. Clean the quick-change adapter with a duster.

**Important:**

Do not use any aggressive solvents.
Do not use any fibrous materials, ie steel wool.

2. Spray the quick-change adapter with a preservation oil to avoid rusting and to preserve the easy running of the quick-change adapter

**Important:**

Before storage all evidence of coolant-lubricant and machining residues must be removed!

5 Application and choice of other quick-change adapters

Type EM..	Rigid type, without overload clutch. Application range: Production of through hole threads
Type EM../IKZ	Rigid type, without overload clutch, coolant-lubricant supply through channels along the tool shank. Application range: Production of through hole threads with internal coolant-lubricant supply
Type EM..-E-Lock	Rigid type, without overload clutch, locking of the tool is secured by form-fitting. The tool must be provided with a groove at one square face. Application range: Clamping of carbide tools, with high coolant-lubricant pressures and in high-speed machining
Type EM..-IKZ/MMS	Rigid type, for minimum quantity lubrication along the tool shank Application range: Production of through hole threads with minimum quantity lubrication
Type EM..-L	With length adjustment, without overload clutch. Serves for pre-adjusting the tools in the quick-change adapters out side the machine. Application range: Production of through hole threads on multi-spindle heads
Type EM..-UL	With adjustable overload clutch and length adjustment. Application range: Production of blind hole threads on multi-spindle heads
Type EM..-Z	Rigid design with adaptation for collets type ER (GB) Application range: Use of carbide tools, with high coolant-lubricant pressures and in high-speed machining
Type EM-L/ER/IKZ	With length adjustment and adaptation for collets type ER (GB) Application range: multi-spindle heads and transfer lines, for the clamping of carbide tools, with high coolant pressures and in high-speed machining
Type EM-PGR	Rigid design with adaptation for collets type PGR (GB) Application range: clamping of carbide tools, with high coolant pressures and in high-speed machining
Type EM..-SE	Rigid design with adaptation for dies acc. to DIN 223 Application range: Production of external threads
Type EM..-ELSE	Rigid design for adaptation of Elastic dies Application range: Production of external threads
Type EM..-R	Reducing adaptation for all EM types Application range: for the extension of the clamping range downwards

6 Torque reference values for thread cutting



The indicated values are reference values for thread cutting in steel with a tensile strength of 600 – 800 N/mm².

Torque		Thread type									
[Nm]	[Ft. lb]	M	UNC	UNF	BSW	BSF	G (Whw) BSP	NPT NPTF	Rc (BSPT)	BA	Pg
0,3	0,2	M2	No.2	No.2						No.9	
0,4	0,3	M2,5	No.3	No.3						No.8	
0,5	0,4		No.3	No.4						No.7	
0,6	0,5	M3								No.6	
0,8	0,6		No.4	No.5						No.5	
1,0	0,7	M3,5	No.5	No.6	1/8					No.4	
1,2	0,9		No.6	No.8							
1,6	1,2	M4	No.8		6/32					No.3	
2,0	1,5			No.10						No.2	
2,5	1,8	M5		No.12		3/16					
3	2,2		No.10	1/4						No.1	
4	3,0		No.12		3/16	7/32				No.0	
5	3,7	M6		5/16	7/32	1/4					
6	4,4		1/4	3/8	1/4	9/32	G 1/8				
8	6,0				5/16	5/16					
10	7,4	M8	5/16	7/16	5/16						
12	8,9			1/2		3/8					
16	12		3/8		3/8			1/16	Rc 1/16		Pg 7
18	13	M10		9/16		7/16	G 1/4				
20	15			5/8							
22	16		7/16		7/16		G 3/8				Pg 9
25	18	M12				1/2		1/8	Rc 1/8		Pg 11
28	21										Pg 13,5
32	24		1/2	3/4	1/2	9/16					Pg 16
40	30		9/16		9/16	5/8					
45	33	M14		7/8		11/16					Pg 21
50	37	M16	5/8		5/8		G 1/2				
56	41						G 5/8	1/4	Rc 1/4		
63	46										Pg 29
70	52		3/4	1	3/4	3/4	G 3/4				
80	59	M18		1 1/8		13/16	G 7/8				Pg 36
90	66	M20		1 1/4		7/8		3/8	Rc 3/8		Pg 42
100	74	M22	7/8	1 3/8	7/8						Pg 48
110	81			1 1/2							
125	92					1					
140	103	M24	1		1		G 1				
160	118	M27					G 1 1/8	1/2	Rc 1/2		
180	133						G 1 1/4				
200	148						G 1 3/8	3/4	Rc 3/4		
220	162	M30	1 1/8		1 1/8		G 1 1/2				
240	177	M33	1 1/4		1 1/4		G 1 3/4				
260	192					1 3/8	G 2				
280	207	M36									
300	221					1 1/2	G 2 1/4				
320	236	M39				1 5/8					

Torque		Thread type									
[Nm]	[Ft. lb]	M	UNC	UNF	BSW	BSF	G (Whw) BSP	NPT NPTF	Rc (BSPT)	BA	Pg
340	250		1 ³ / ₈		1 ³ / ₈		G 2 ¹ / ₂	1	Rc 1		
360	266		1 ¹ / ₂		1 ¹ / ₂		G 2 ³ / ₄				
400	295	M42					G 3				
420	310	M45					G 3 ¹ / ₄				
450	332					1 ³ / ₄	G 3 ¹ / ₂	1 ¹ / ₄	Rc 1 ¹ / ₄		
480	354						G 3 ³ / ₄				
500	369					2	G 4				
560	413	M48			1 ⁵ / ₈			1 ¹ / ₂	Rc 1 ¹ / ₂		
630	465	M52	1 ³ / ₄		1 ³ / ₄						
710	524	M56				2 ¹ / ₄		2	Rc 2		
800	590	M60			1 ⁷ / ₈	2 ¹ / ₂					
900	664	M64				2 ³ / ₄					
1000	738	M68	2		2						
1100	811		2 ¹ / ₄		2 ¹ / ₄	3					
1170	863	M72									
1230	907	M76									
1300	959	M80									
1380	1018	M85									
1400	1033		2 ¹ / ₂		2 ¹ / ₂			2 ¹ / ₂	Rc 2 ¹ / ₂		
1460	1077	M90									
1540	1136	M95									
1620	1195	M100									
1700	1254	M105									
1780	1313	M110									
1860	1372	M115									
1940	1431	M120									
2000	1475		2 ³ / ₄		2 ³ / ₄			3	Rc 3		
2020	1490	M125									
2110	1556	M130									
2200	1623				3						
2270	1674	M140									
2430	1792	M150									
2680	1977	M160									

Notes:

Notes:

