

# Tapping chuck

## ETC.1 / ETC.2 / ETC.3

Date of purchase: \_\_\_\_\_

Congratulations on your purchase of your Euroboor ETC tapping chuck.

Before operating your new tapping chuck, please read all instructions in this document first. With proper use, care and maintenance this tapping chuck will provide you with years of effective performance.

**TO REDUCE THE RISK OF INJURY USER MUST READ AND UNDERSTAND ALL INSTRUCTIONS**

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# Table of contents

<b>1. Preparation and set-up</b>	<b>4</b>
1.1 Intended use	4
1.2 Mounting the tapping chuck to the machine	4
1.3 Inserting the tap	4
1.4 Torque setting	5
<b>2. Operation</b>	<b>6</b>
2.1 Pre-drilling	6
2.2 Through hole tapping	6
2.3 Blind hole tapping	6
2.4 Tapping speeds	7
2.5 Cutting fluids	9
<b>3. Maintenance</b>	<b>10</b>
3.1 Cleaning and lubrication	10
3.2 Overhaul and repair	10

# 1. Preparation and set-up

## 1.1 Intended use

This Euroboor tapping chuck can be used on all types of manually operated machines with rotating reversible spindles with Morse Taper connection, including Euroboor magnetic drilling machines.

Follow general instructions provided with the machine you are using as much as possible. The instructions in this manual are specified for use of the tapping chuck itself in combination with (Euroboor) magnetic drilling machines.

## 1.2 Mounting the tapping chuck to the machine

It is very important to fit the Morse Taper tapping chuck firmly and safely, as it will be rotating in both directions and will be dealing with considerable (alterations in) torque.

1. Make sure the inside of the output shaft and the Morse Taper spindle are clean and free of grease
2. Firmly slide the tapping chuck into the output shaft by hand. Make sure the spindle is properly positioned. You should not be able to pull it out by hand.
3. To remove the Morse Taper spindle
  - Switch of the motor
  - Change the mechanical gear switch (if present) to neutral
  - Rotate the output shaft until the slots on the shaft align with the slots on the gearbox
  - Gently tap the supplied drift into the slots to push the tapping chuck out

## 1.3 Inserting the tap

1. Insert the desired tap through the chuck nut of the tapping chuck. The square at the tap end is fitted and centred between the adjustable square nuts, which should be loosely tightened (fingertip tight).

NOTE: step 1 is just the preparation for the actual tightening of the tap in step 2.

2. Tighten the chuck nut firmly, forcing the rubber collet to tighten itself around the shank of the tap.
3. Slightly loosen the adjustable square nuts to take away any unwanted, decentring stress on the tap

The tap is now correctly tightened and centred.

## 1.4 Torque setting

On the tapping chuck thread sizes are pre-marked. These predefined settings apply to the amount of torque needed for material with a tensile strength of  $\leq B \leq 1000 \text{ N/mm}^2$  (45,000 Lbs/sq.in.)

Metric	Withworth	Nm
M3		0,5
	1/8"	1
M4		1,6
	5/32"	2
	3/16"	4
M5	7/32"	5
	1/4"	8
M8		10

Metric	Withworth	Nm
	5/16"	12
M10	3/8"	18
M12	7/16"	28
M14	1/2"	45
M16		50
	5/8"	63
M18		80
M20	3/4"	90

Metric	Withworth	Nm
M22		100
	7/8"	125
M24		160
M27		180
	1"	200
M30		280

There are many factors that influence the actual torque requirement such as diameter of pre-drilled holes, use of cutting lubricant, centration of tap, etc.

Reduction of torque setting is advised for:

- Tapping fine-pitch threads
- Tapping non-ferrous materials such as aluminium alloys and brass

Increase of up to 50% might be required for:

- Tougher materials with higher tensile strength. As rule of guide can be used: the percentage over  $\leq B \leq 1000 \text{ N/mm}^2$  (45,000 Lbs/sq.in.), can be used as percentage the torque setting should be increased

Increase of 40 to 100% might be required for:

- Cold forming threads

NOTE: Under all circumstances we strongly advise to run one or more tests to allow yourself the possibility of fine-tuning and finding the best appropriate setting for use on the actual workpiece.

## 2. Operation

### 2.1 Pre-drilling

Pre-drilling or machining the hole to be tapped is performed according to the specifications, requirements and instructions provided with the machine and/or tool used.

### 2.2 Through hole tapping

1. Apply lubricant to the tap
2. With the machine and workpiece in the exact same place as they were with the pre-drilling operation, let the machine run at the required speed in the correct direction.
3. Gently press the tap against the opening of the hole until it catches.
4. Gently assist the tap through the hole by applying little feed pressure until the desired depth is reached, and stop the machine.

NOTE: be careful not to feed the tap through the hole completely, as it will make returning the tap without destroying the freshly tapped thread difficult!

5. Reverse the spindle direction on the machine, start the machine without changing the spindle speed and let the tap find its way back through the hole. Loosely hold the machine feed handles, but do not apply any pressure in any direction
6. When the tap has pushed itself from the hole, pull the tap away from the hole

### 2.3 Blind hole tapping

We recommend the use of spiral taps for accurate and efficient blind hole tapping, ensuring allowance of clearance between the tap and the bottom of the hole, as well as avoidance of chip clogging. de

The correct torque setting help you prevent tap breakage, and destruction of the freshly tapped thread. However, always be aware of the insertion of the tap versus the depth of the hole so you are prepared for further action.

1. Check the hole for correct size, and if it is cleared from chips and other debris.
2. Mark either machine or tap for the depth of the hole as help during the process.
3. Set the Euroboor tapping chuck to the correct torque setting
4. Apply lubricant to the tap
5. With the machine and workpiece in the exact same place as they were with the pre-drilling operation, let the machine run at the required speed in the correct direction.
6. Gently press the tap against the opening of the hole until it catches.
7. Gently assist the tap through the hole by applying little feed pressure until the desired depth is reached. The tapping chuck should now start slipping, leaving the tap in fixed position.
8. Stop the machine
9. Reverse the spindle direction on the machine, start the machine without changing the spindle speed and let the tap find its way back through the hole. Loosely hold the machine feed handles, but do not apply any pressure in any direction
10. When the tap has pushed itself from the hole, pull the tap away from the hole

## 2.4 Tapping speeds

This Euroboor tapping chuck has been designed to operate at max. 800 rpm.

The best tapping speed is dependent on different factors, such as:

- Material to be tapped
- Use of lubricant
- Tap selection
  - o Length of chamfer
  - o Rake angle
  - o Standard, spiral or spiral point
- Thread specification
  - o Pitch
  - o Straight or tapered
  - o Percentage of full thread
  - o Depth of hole & thread

As general base guideline, the following speeds are recommended as starting point:

Material	Rake angle	Cutting speed HSS tap	
		m/min	ft/min
Carbon steel 0,10 - 0,50% C		6 - 15	20 - 50
0,50 - 1,10% C		6 - 12	20 - 40
Stainless steel		3 - 9	10 - 30
Chromoly	10 - 15°	3 - 9	10 - 30
Monel		3 - 7	10 - 23
Cast steel		4,5 - 15	15 - 50
Cast iron	3 - 7°	9 - 24	30 - 80
Brass (drawn / cast)	10 - 15° / 0 - 5°	18 - 30	60 - 100
Bronze	0-5°	10,5 - 18	35 - 60
Aluminium (drawn / cast)	20 - 30 / 10 - 15°	18 - 30	60 - 100
Bakelite	0 - 5°	9 - 20	30 - 65
Plastics	20 - 30°	18 - 21,5	60 - 70

### Conversion to rpm

*m/min*

*m/min / (π x Ø in meters)*

example: Ø 12 mm (= 0,012 meter) with 15 m/min

$$15 / (3,14 \times 0,012) =$$

$$15 / 0,03768 = \text{rpm } 398/\text{min}$$

*ft/min*

*ft/min x (1 / ((π x Ø in inch) / 12))*

example: Ø 1/2" with 50 ft/min

$$50 \times (1 / ((3,14 \times 0,5) / 12)) =$$

$$50 \times (1 / (1,57 / 12)) =$$

$$50 \times (1 / 0,13083) =$$

$$50 \times 7,643 = \text{rpm } 382/\text{min}$$



## 2.5 Cutting fluids

The use of appropriate cutting fluids or paste is essential to the tapping operation, for two purposes:

- Cooling: properly cooled tools last longer, save the workpiece material and increase sizing accuracy.
- Cutting efficiency: friction is reduced, chips are cleared from the hole, and active contents of the chosen cutting fluid or paste actually increase the cutting performance.

Within the Euroboor range, several cutting lubricants are available. Highly recommended are:

- IBO.60            Threading oil  
                         Universal non-staining cutting oil, with consistency and ingredients specifically for tapping purposes
- IBP.50/2        Cutting paste  
                         Universal cutting paste, especially suitable for high-alloy steel grades and hard to lubricate spaces and working situations.

Other lubricants with specific properties are also available, such as:

- IBO.10            Mild steel lubricating cooling and cutting oil
- IBO-P.911       Mild steel lubricating cooling and cutting oil in spray can
- MV.4             Water-soluble cooling lubricant
- IBO.20            Heavy duty cutting lubricant for high-alloys
- IBO.50            Mild oil for non-ferrous metals such as aluminium, copper, zinc

# 3. Maintenance

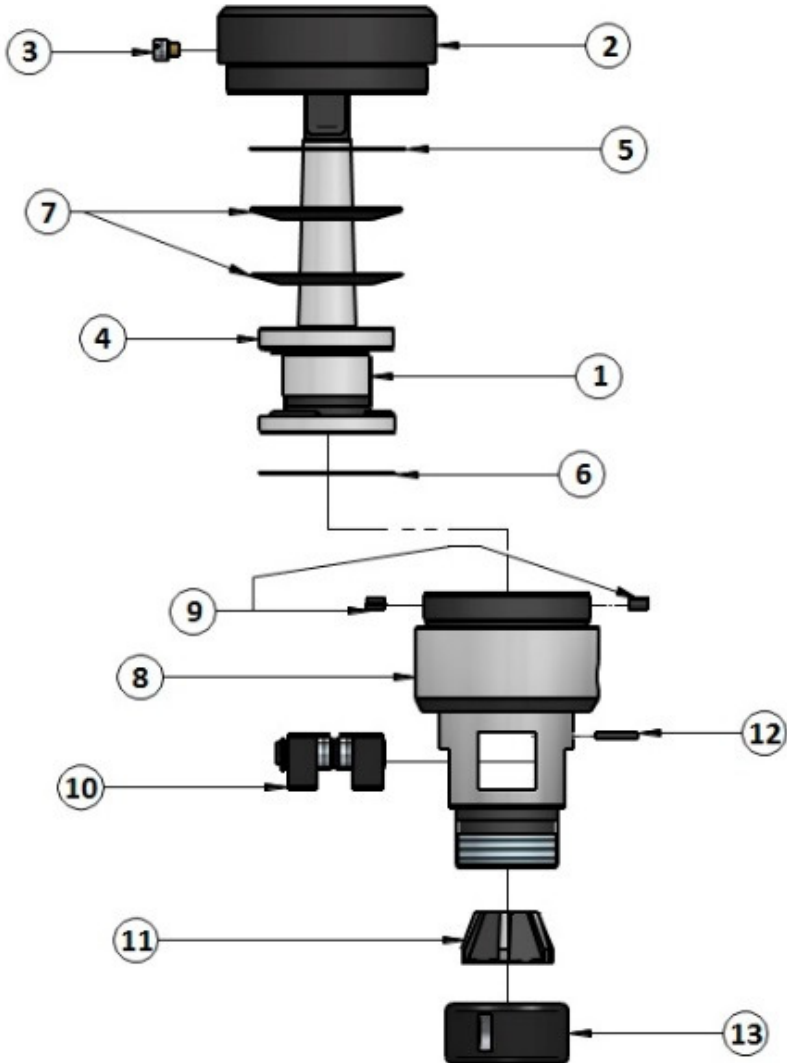
## 3.1 Cleaning and lubrication

This Euroboor tapping chuck is supplied ready to use. To keep this tool in good working order, regular cleaning is required after approximately every 600 operating hours.

- Partially disassemble the Euroboor tapping chuck to reach the clutch
- Take the washers and springs from the chuck, keep them in order, and clean them.
- Apply only a very thin film of oil or grease to the washers and springs for optimum function and corrosion protection. Do not over-lubricate as it will allow the components to slip, reducing function and lifetime.

## 3.2 Overhaul and repair

This Euroboor tapping chuck has been designed with ease of use and maintenance in mind. Below you can find the exploded view and matching spare part numbers.



## List of spare parts and accessories

For number referral, see exploded view on page 10.

Tapping chuck		ETC.1		ETC.2		ETC.3	
		3-12 mm 1/8 - 7/16"	Qty	8-20 mm 5/16 - 3/4"	Qty	14-30 mm 1/2 - 1-3/16"	Qty
1	Taper shank	ETC.1-1	1	ETC.2-1	1	ETC.3-1	1
2	Cup nut	ETC.1-2	1	ETC.2-2	1	ETC.3-2	1
3	Screw for cup nut	ETC.1-3	1	ETC.2-3	1	ETC.3-3	1
4	Cam for tapping chuck	ETC.1-4	1	ETC.2-4	1	ETC.3-4	1
5	Plain washer	ETC.0-5					1
6	Washer	ETC.0-6					1
7	Cup springs (set)	ETC.1-7	1	ETC.2-7	1	ETC.3-7	1
8	Body	ETC.1-8	1	ETC.2-8	1	ETC.3-8	1
9	Pin cam (set)	ETC.1-9	1	ETC.2-9	1	ETC.3-9	1
10	L-R nut (assembly)	ETC.1-10	1	ETC.2-10	1	ETC.3-10	1
11	Rubber collet tap shank size 3,5 - 6,5 mm (1/8 - 1/4")	ETC.A	1	-			
	Rubber collet tap shank size 6,5 - 10 mm (1/4 - 3/8")	ETC.B	1	-			
	Rubber collet tap shank size 4,5 - 10 mm (3/16" - 3/8")	-		ETC.C	1	-	
	Rubber collet tap shank size 10 - 16 mm (3/8 - 5/8")	-		ETC.D	1	-	
	Rubber collet tap shank size 9 - 16 mm (3/8 - 5/8")	-				ETC.E	1
	Rubber collet tap shank size 16 - 23 mm (5/8 - 15/16")	-				ETC.F	1
12	Pin for body	ETC.0-12					1
13	Chuck nut	ETC.1-13	1	ETC.2-13	1	ETC.3-13	1

### Accessories:

Allen key 3 mm	IMB.US3	2	IMB.US3	1	IMB.US3	1
Allen key 4 mm	-		IMB.US4	1	-	
Allen key 6 mm	-				IMB.US6	1
Spanner A/F 26.5	ETC.SP1	2	-			
Spanner A/F 34.0	-		ETC.SP2	2	-	
Spanner A/F 37.5	-				ETC.SP3	1
Spanner R/26	-				ETC.SP4	1
Tightening rod ETC.2	-		ETC.TR1	1	-	
Tightening rod ETC.3	-				ETC.TR2	1

