EUROTECH

Winning with Technology
that Runs Faster, Sleeps Less!

APPLICATIONS
THREAD ROLLING

INTRODUCTION

Do you need to produce **external threads** on a very large series of pieces? **Thread rolling** may be your solution. This process forms the thread by shaping the metal, without removing chips.

This is done using rollers that are the “negative” of the thread being produced. The **machining times are much shorter** than for thread turning, since it is done in just one round. Furthermore, **the tool is very durable** and the quality and physical properties of the thread are better. This process can be carried out using any of the **EUROTECH lathes** in our series

Thread rollers.

TYPES OF ROLLING HEADS

The thread rollers are housed in heads that can be connected to the machine. There are different types of heads depending on the application that they will be put to.

· AXIAL HEADS

These can produce threads of any length, in a range of diameters from 1.4mm to 230mm.

Axial rolling head.
Image courtesy of LMT Tools.

· RADIAL HEADS

The maximum length of the threads is limited to the width of the rollers. They are available for a range of diameters between 3mm to 45mm.

Radial rolling head.
Image courtesy of LMT Tools

· TANGENTIAL HEADS

These allow for very short threads, even behind walls. The maximum length of the threads is limited to the width of the rollers. They are available for a range of diameters between 1.6mm to 64mm.

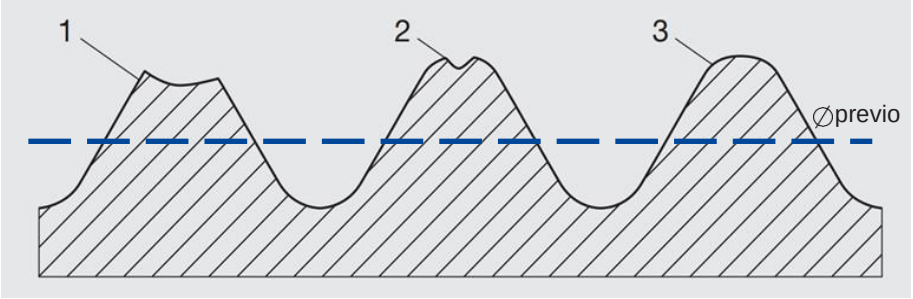
Tangential rolling head.
Image courtesy of LMT Tools

Different sets of rollers can be mounted on each head to machine threads of different types, measurements and pitches.

This document will explain how to produce a rolled thread using an axial rolling head on your EUROTECH lathe.

Functioning of the axial rolling head

The area to be rolled must be pre-machined to a certain diameter given by the manufacturer. This initial diameter, combined with the fine adjustments of the head, will determine the final dimensions of the thread, since we must not forget that the thread is produced by re-shaping the material.



Turned and re-shaped profile of the material. Image courtesy of LMT Tools

The ideal profile of the thread is indicated in the diagram as type 2, showing a well-formed thread and maximising the lifespan of the rollers.

As for the thread-making process itself, the piece is spun at a set speed, and the threader is fed forwards with feed rate close to the pitch of the thread. Both values are recommended by the manufacturer of the rolling head.

When the length of the thread is reached, the feed of the rolling head is stopped, which causes the head to open, allowing the piece to be removed without damaging the thread that has been produced.

Once removed, the rolling head must be reset to prepare it for the next piece. The **reset process** can be done in several ways:

-Mechanically: The head has a protrusion which, when pushed against an auxiliary static element inside the machine, allows the threader to be reset.

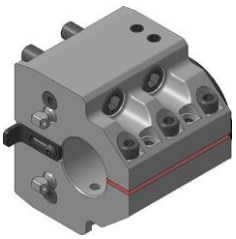
Mechanical reset of the LMT head.
Image courtesy of LMT Tools.

-Closing device: This accessory makes it possible to reset the head thanks to the hydraulic pressure provided by any coolant or by compressed air. The standard closing device requires a minimum actuation pressure of 8 bars. EUROTECH provides pumps of 6, 15, 35 and 70 bars of pressure. For our most basic 6 bar pump, there is a special closing device that has already been tested, which is actioned with a minimum pressure of 5 bars.

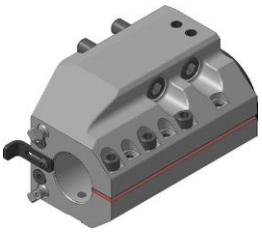
Closing device.
Image courtesy of LMT Tools

MOUNTING THE AXIAL THREADER ON THE TURRET

For the TA and TD versions of the machines we recommend mounting on any of our internal toolholders, for example, in our models **TL20/10000/09, TL20/10000/10, TL20/10000/12** or in the new generation ones **TD/10300/40, TD/10300/41.** All of the toolholders for the TA and TD series are manufactured fully by EUROTECH. An auxiliary reducing sleeve will be necessary, which we can also provide to be adapted to the handle of the rolling head



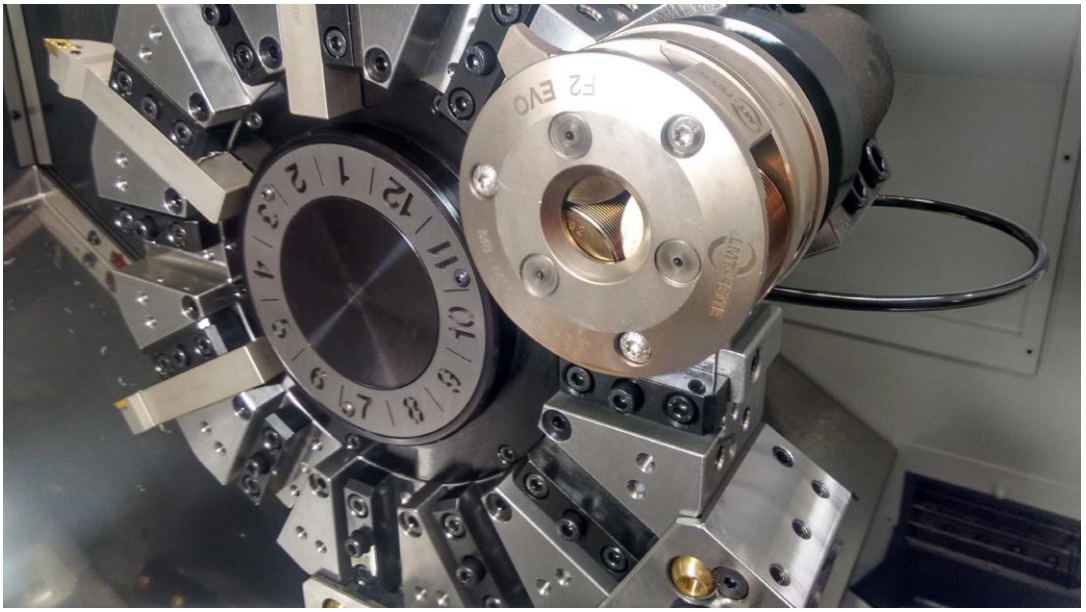
TD/10300/40 (Ø40mm)

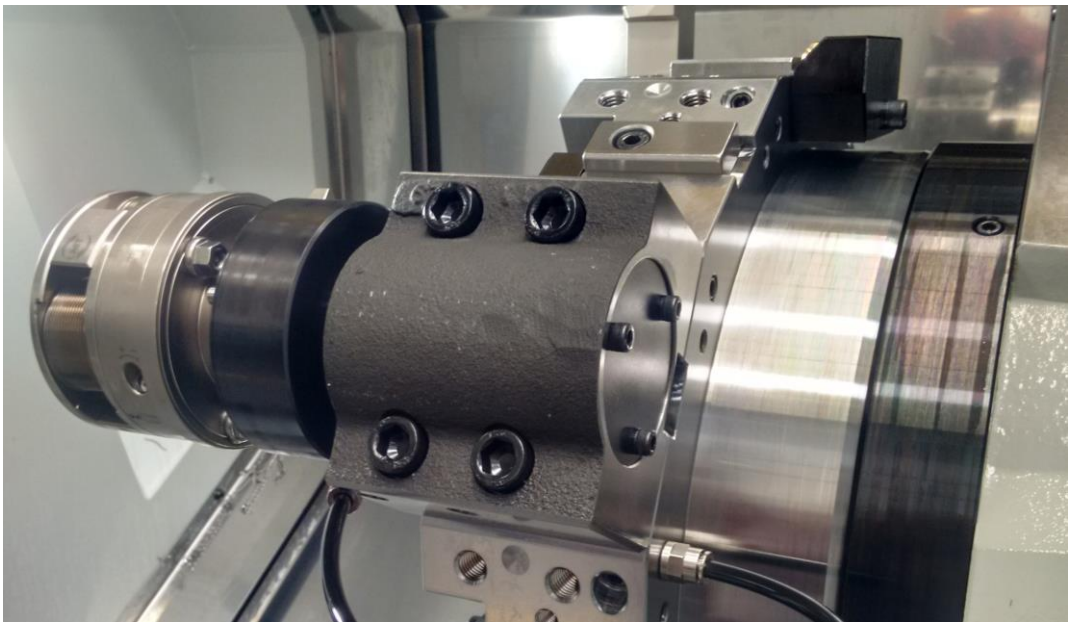


TD/10300/41 (Ø40mm)

For the TX model, internal toolholders from other manufacturers can also be used, such as for example the NKM0113220 from MT-Marchetti, together with the necessary reducing sleeves.

As can be seen in the following images, the rolling head is mounted on the TL20/10000/12 toolholder, and hydraulic reset with coolant has been chosen. Because of this it is necessary to connect the reset circuit of the rolling head to the coolant outlet of one of the adjacent turret positions. It is not possible to connect it to the coolant outlet of the same station, since the thread is produced using coolant and it must be possible to control the reset separately





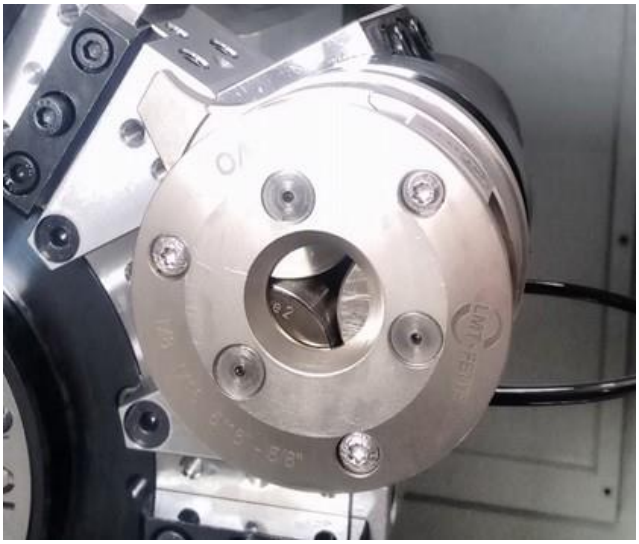
Mounting of the head on the turret.
Images courtesy of LMT Tools.

You will find an example of programming further on in this document.

SELECTION, MOUNTING AND ADJUSTMENT OF THE THREAD ROLLERS

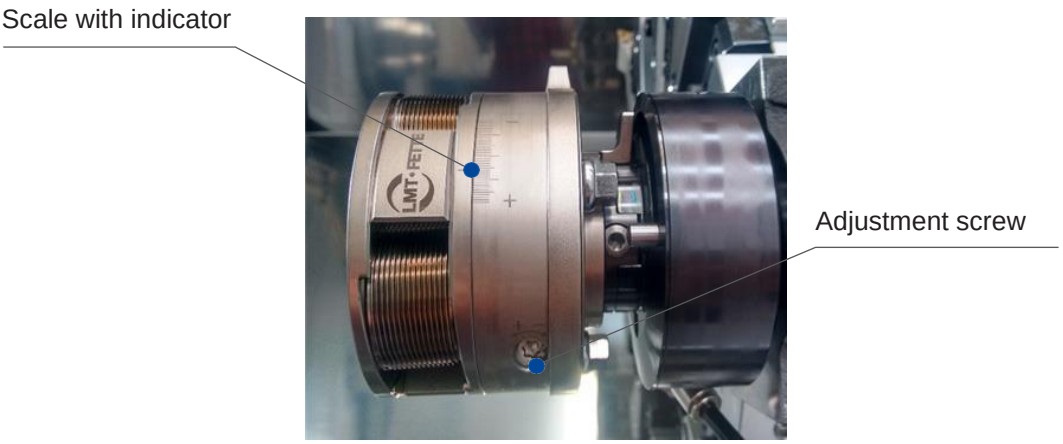
The rollers must be chosen depending on the type of thread, its measurements and the pitch of the thread. Each set of rollers is able to produce threads of the same pitch in a range of measurements. That is why a subsequent adjustment of the threader is necessary, which will be detailed in this section

As for the mounting of the thread rollers in the rolling head, they must be placed according to a set pattern (the rollers are named with letters and numbers) which is set by the manufacturer. This is a very important detail, they must never be placed randomly. Both sides of the rollers are usable, thus increasing their useful lifespan even more. Mounting the rollers
onto the head is done by disassembling the front cover.



Frontal view of the head.
Image courtesy of LMT Tools.

Once the rollers are mounted, it is necessary to carry out a fine adjustment of the head using a screw, to increase or decrease the distance of the rollers from the centre of the threader. The manufacturer provides a series of guidelines on how to do this.



Side view of the head.
Image courtesy of LMT Tools.

From the side of the threader we can see a scale with an indicator. When disassembling a set of rollers under any circumstances (for example, to use the same head with another set of rollers) and replacing them, we can make fine adjustments by simply looking at the scale, and repeating the value of the first setting.

EXAMPLE OF PROGRAMMING

In this example, we will make a thread of M14x1.5 with a length of 40mm. The working material is F-114 steel

T0101 (Thread rolling tool)
G97 S1000 M3 M8 (Cutting conditions)
G0X0Z10 (Point of contact)
G1 Z-40 F1.43 (40mm thread, feed determined by the manufacturer for a thread with 1.5mm pitch)
G4 X2 (Timing of 2 seconds, feed stopped, the threader head opens)
G0Z10 (Withdraw the threader from the piece at G00)
G00 X100 Z100 M9 (Withdrawn to safe point)
T0202 (Position adjacent to the turret where we have connected the head reset system)
M8 (Activation of the coolant for the reset)
G4X1 (Timing of 1 second, the head is reset)
M9 (Deactivation of coolant)
M5