

# T-DRILL

PRODUCTIVITY AS A PRODUCT.



## CHIPLESS CUTTING

Rotary Tube Cut-Off Machines with optional end forming

TCC &  
EF-SERIES

# THE T-DRILL CHIPLESS CUTTING TECHNOLOGY TCC

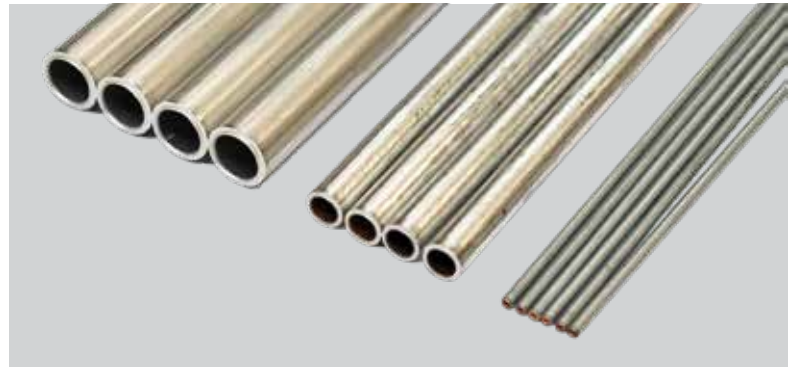
## Why choose T-DRILL's TCC?

The **T-DRILL** Chipless Cutting Technology is a clean, cost-effective and accurate rotary cutting method for tubes below 2" (Ø 50,8 mm) diameter. The **TCC-series** can handle tube from coil or straight lengths with tube wall thickness up to .100" (2,5 mm). Several models are available for different applications.

- No circular saw blades needed
- Longer blade life
- Low cutting blade cost
- No material loss between cuts
- No chips
- No investment for chip handling system
- Clean cutting method – No need for washing
- Fast cycle time – maximum ~ 3000 pcs / h
- Low operating noise level
- Optional Inline End Forming (3-8 hits) replaces the investment for one more production step
- Waste material minimization and cut piece optimization systems available
- More than 500 TCC machine deliveries by T-DRILL globally.



Copper, brass



Aluminium, steel, stainless steel



Coated materials

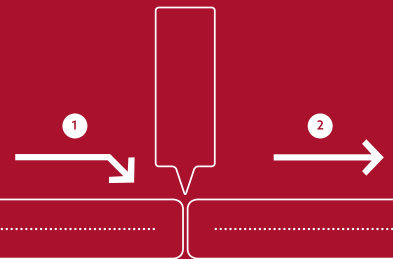


Cutting with grooves

# THE T-DRILL PROCESS

1. Cutting of the tube

2. Tube pull-apart



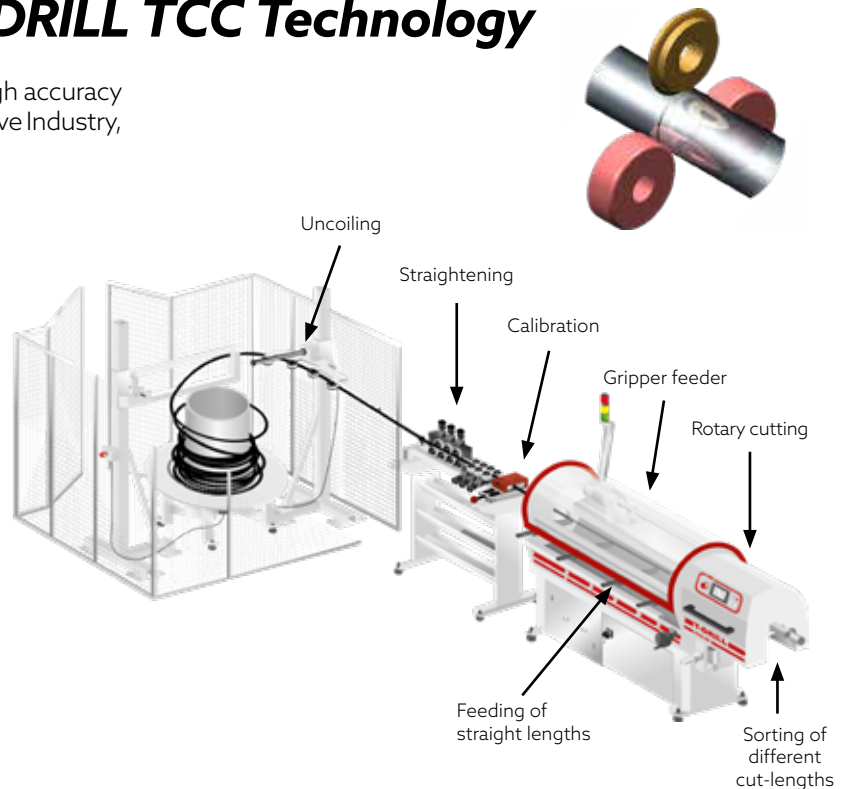
## Common uses of The T-DRILL TCC Technology

The chipless cutting technology offers extremely high accuracy with fast production rates especially within Automotive Industry, when working with the following parts:

- Brake tubing
- Fuel tubing / fuel rails
- Engine cooling tubes
- Battery cooling system in hybrid and electric cars
- Air conditioning tubes
- Power steering tubes

The TCC technology offers great advantages also with the following application areas:

- HVAC components
- Solar panels
- Heat exchanger components
- Other applications i.e.
  - Cable shoes
  - Towel dryers
  - Musical instruments
  - Spiral coated flexible tubes etc.



1. Inspection and marking (optional)



2. Inline End Forming (optional)



3. Sorting different cut-lengths after cutting



4. Automotive components



5. HVAC (Heat, Ventilation, AirCon)



6. Cutting + End Forming

# T-DRILL CHIPLESS CUTTING



## TCC-50 MCS Chipless Cutting Machines

The semi-automatic **TCC-50 MCS** provides a cost effective solution for those needing the benefits of a chipless rotary cut-off but with lower volume requirements. The tube is fed manually by the operator to the adjustable stopper followed by automatic rotary cut-off. With a digital read-out the cut-length setting can be made fast and accurately. The tube diameter range is 1,5–50,8 mm. The machine is suited for copper, aluminium, brass, CuNi, mild- and stainless steel.

The rotary cut-off eliminates chips, scrap, secondary deburring and part washing. It is ecologically friendly, quiet and fast cutting method. Minimal I.D. reduction is of vital importance for secondary operations such as mandrel bending and stand alone end forming. This can be achieved with the **TCC-50 MCS** by using a fast two step cutting method. First the cutting disk penetrates 95% of the tube wall, which is then followed by separation by lateral pulling apart.

# MCS CAPACITY



## MCS General Capacity

|                        |                                                        |
|------------------------|--------------------------------------------------------|
| Materials              | Copper, Aluminium, Steel, Stainless Steel, CuNi, Brass |
| Minimum diameter       | 1,5 mm / 0.06"                                         |
| Maximum diameter       | 50,8 mm / 2"                                           |
| Minimum cut length     | 50 mm with through cut / 75 mm with pull apart cut     |
| Maximum wall thickness | 2,5 mm / 0.1"                                          |

# **T-DRILL**

## **CHIPLESS CUTTING**



## **TCC-28**

### **Chipless Cutting Machines**

**T-DRILL** has automatic tube cutting machines for cutting from coil or for straight lengths. With automatic cut length setting it is able to cut all malleable materials such as aluminium, copper, steel and stainless steel within the diameter of 1,8-28 mm.

The machine can be programmed to cut multiple different lengths, which is especially useful with straight lengths.

This allows waste minimizing by selecting optimum cut lengths and the number of cuts.

# TCC-28 ACCESSORIES



## 1-2. Coil holder system with tension unit

Tubing can be fed from different types of single or double coil holders with different types of coils (cardboard, bulk and capillary) for different applications

## 3-4. Tube straightener with calibration roll station

Tube straightener consists of vertical and horizontal rolls (7+7 or 9+9) and it can be equipped with digital readout for easy setup. Straightening rolls can also be changed without any tools with an optional quick changing system.

## 5. NDT (Non-Destructive Testing) or color detecting

**T-DRILL** cutting machines can be equipped with tube pre-straightening equipment as well as NDT (Non Destructive Testing) or color detecting equipment that automatically remove the bad sections from the coiled tubing during the cutting process.

## 6. Diverting Table

With the diverting table the tubes of different lengths can be separated to three different boxes as a standard solution. The trim and waste cut are guided to a scrap box.

# T-DRILL CHIPLESS CUTTING



## TCC-50 RL Chipless Cutting Machines

The automatic machine **TCC-50 RL** with Rackloader is used when the raw material is coming in straight lengths up to 50,8 mm diameters. There are two lengths of rackloaders, for tube lengths max. 4000 mm and max. 6000 mm. In cutting of straight tubes the machine offers a remarkable advantage: minimizing of rest pieces. This means that the **TCC-50 RL** is able to change the cutting length automatically: it can be programmed to cut e.g. 6000 mm long straight tube so that the rest piece will be as short as possible.

**TCC-50 RL** is normally provided with an automatic sorting table, where the different cut lengths are assorted to a box of their own and the trim cut & rest piece to its own. There are available different sorting tables suitable for max. cut lengths from 2000 mm to 5700 mm.

# TCC RL & COIL CAPACITY



If you have a need to cut both tubes from coil and from rackloading systems for straight length tubes, we have a perfect solution: **TCC RL & Coil** Automatic Tube Cutting Center, that combines both the properties. With this machine you can cut straight tube diameters and also coil tubes of various materials such as copper, aluminum, stainless steel.

Typical application areas are for example in automotive industry and heat exchanger industry, where good cutting quality and superior production speed is needed.

## TCC RL & Coil Capacity

|                        | Straight lengths                                                                                                                                             | Coiled tubing                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Materials              | Copper, Aluminium, Steel, Stainless Steel, CuNi, Brass                                                                                                       | Copper, Aluminium, Steel, Stainless Steel, CuNi, Brass |
| Minimum diameter       | 6 mm / 1/4"                                                                                                                                                  | 1,5 mm / .060"                                         |
| Maximum diameter       | 50,8 mm / 2"                                                                                                                                                 | 22 mm / 1.125"                                         |
| Minimum cut length     | For very short cut lengths (less than 50 mm) Cut & Break system, which works for pipes up to ~Ø 20 mm<br>50 mm with Through cut<br>75 mm with Pull apart cut |                                                        |
| Cut length tolerance   | ± 0,1 mm                                                                                                                                                     | ± 0,1 mm                                               |
| Maximum wall thickness | 2,5 mm / 0.1"                                                                                                                                                | 2,5 mm / 0.1"                                          |

# **T-DRILL**

## **CHIPLESS CUTTING & END FORMING**



### **TCC-45 EF8**

#### ***Chipless Cutting Machines with In-line End Forming***

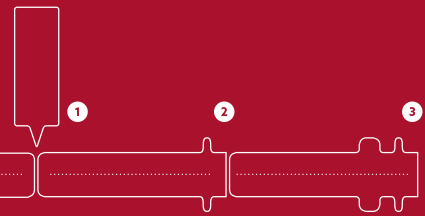
Automatic chipless rotary cutting and grooving machine, combined with in-line and end forming unit. All these three operations are made simultaneously.

For all malleable materials such as aluminium, brass, copper, steel and stainless steel. With cut lengths 40 - 915 mm (1½ - 36") the end forming takes place simultaneously with the cut-off process, which improves the production rate.

- Max. end forming hits: 3 or 8
- Tube diameters: 6 - 25 mm

# THE T-DRILL PROCESS

1. Cutting of the tube 2. Forming of the first shape 3. Forming of the second shape



## TCC-45 EF8 Capacity

|                                          |                                                                                                                                                                                                        |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials                                | Copper, Aluminium, Steel, Stainless Steel                                                                                                                                                              |
| Minimum diameter                         | 6 mm / 1/4"                                                                                                                                                                                            |
| Maximum diameter                         | 22 mm / 7/8"                                                                                                                                                                                           |
| Tube lengths                             | Single hitch feed 40 – 915 mm (1½ – 36") with simultaneous cutting and end forming<br>Multi hitch feed 915 – 6000 mm (36" – 236") end forming takes place before the cut-off                           |
| Production rates for 40 – 915 mm lengths | Cutting only: 1125 – 2250 pcs/h<br>1-hit end forming: 900 – 1380 pcs/h<br>2-hit end forming: 800 pcs/h<br>3-hit end forming: 520 pcs/h<br>6-hit end forming: 280 pcs/h<br>8-hit end forming: 200 pcs/h |
| End former specifications                | Hydraulic, max. 8 stations/tools<br>Adjustable clamping force<br>Adjustable ram force up to 4,5 tons<br>Standard or springloaded forming tools (clamps + punches)                                      |



## Typical Applications

- Automotive brake and fuel lines
- Automotive exhausts
- Solar panels
- Heat exchanger applications
- Refrigeration
- Heating

## ***DO IT WITH T-DRILL***

Cut costs – Improve quality – Increase profit

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