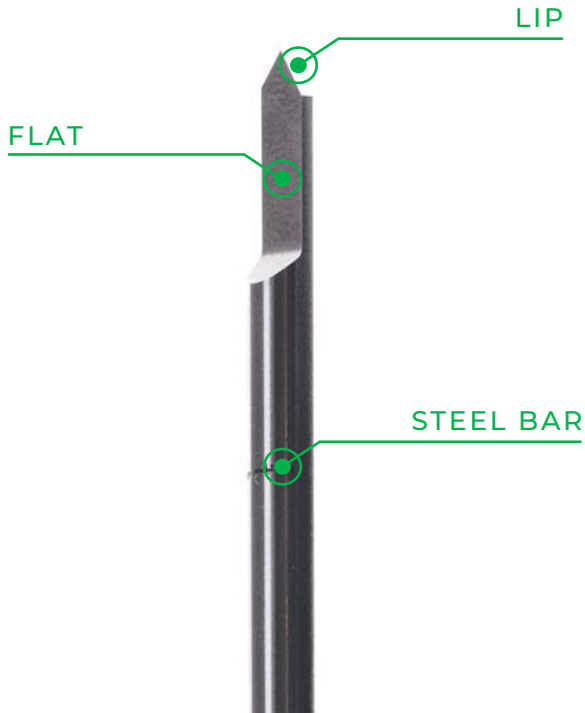


# MECHANICAL ENGRAVING

## How to choose your tool?



### What is an engraving cutter?

Used for engraving and cutting operations on a variety of materials, the cutter is a cutting tool that operates by rapid rotation.

The engraving and cutting stylus consists of:

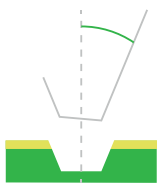
- a **steel** (or High Speed Steel, HSS) or **carbide** bar cut to length;
- a **flat surface machined** for the required application;
- **cutting lips**, also called teeth.

## THE COMPOSITION OF AN ENGRAVING AND CUTTING CUTTER

There are two main types of cutter alloy:

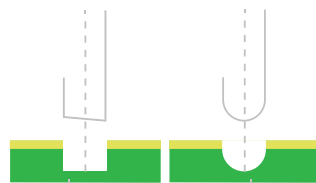
- **Steel cutters** : harder and more resistant to wear, even at high temperatures. They maintain their strength and cutting capacity.
- **Tungsten carbide cutters** : Extremely resistant and durable, they are the most common today. Used for engraving and cutting harder materials.

## DIFFERENT CUTTER SHAPES



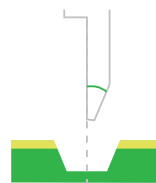
**Conical**

- Create a V-shaped groove
- Engrave very small characters
- Provide an aesthetic rendering typical of engraving



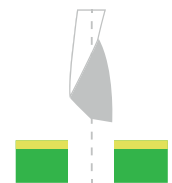
**Cylindrical with flat or round end**

- Create a groove with straight edges
- Engraving base follows the shape of the tool



**1/4 round**

- Create conical grooves
- Highly resistant to hard metal engraving
- Allow good chip clearance



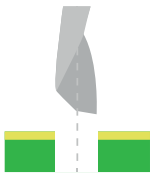
**Spirals and helicals**

- Dedicated to cutting
- Their spiral profile favors chip evacuation and improves cutting quality while achieving higher speeds



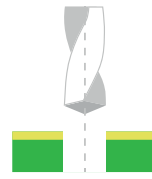
## THE NUMBER OF LIPS FOR CUTTING

The more teeth or lips a cutter has, the finer and more even the cut will be. On the other hand, this level of precision impacts the removal of material, which is then longer.



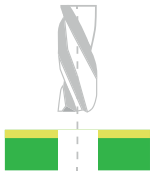
### 1 lip

Machining aluminum, PVC, acetates, light alloys, grooving non-ferrous materials.



### 2 lips

Suitable for soft materials (aluminum, brass, plastic).



### 3 lips

Used for roughing work (rapid removal of large quantities of material).



### 4 lips

Dedicated to finishing and roughing work thanks to deeper flutes which facilitate good chip clearance.

## HOW TO SELECT THE RIGHT CUTTER FOR YOUR PROJECT

### Engraving or cutting?

	Engraving (engraving cutters)	Cutting or drilling (cutting cutters)
Cutter shapes	<ul style="list-style-type: none"> <li>• Conical</li> <li>• Cylindrical with flat or round end</li> <li>• ¼ round</li> </ul>	<ul style="list-style-type: none"> <li>• 45° and 15° conical</li> <li>• Spirals and helicals</li> </ul>

### For which materials?

	two-layer Plastic	two-layer	Acrylic	Soft metals (aluminum or brass)	Hard metals (steel)
Conical	Engraving	Engraving	Engraving	Engraving	-
Cylindrical with flat or round end	Engraving	Engraving	Engraving	Engraving	-
¼ round	-	-	-	Engraving	Engraving
45° and 15° conical	Cutting	Cutting	Cutting	Cutting	-
Spiral and Helical	Drilling	Drilling	Drilling	Drilling	-

## For which machine?

	Engraving / Cutting / Drilling	Dragging (Diamond engraving)
M10	-	Twincut
M20* / IM3	Onecut 3.17 mm	
M20 V3 M20 X M40 IS200	Twincut Onecut 4.36 mm	Twincut Onecut 4.36 mm
IS400	Twincut (with collets or high-frequency spindle) Onecut 4.36 mm Onecut 6.35 mm Percut (with collets or high-frequency spindle)	Twincut (with collets or high-frequency spindle) Onecut 4.36 mm Onecut 6.35 mm (with collet spindle)
ISx000	Twincut (with collets or high-frequency spindle) Onecut 6.35 mm Percut (with collets or high-frequency spindle)	Onecut 6.35 mm (with collet spindle) Twincut (with collets or high-frequency spindle)

\*M20 are machine versions produced until June 2018. M20 v3 and M20 X are machines produced after this date.

### Twincut



The Twincut solution (available in 4.36 mm) is the most **versatile**. The cutters in this range can be used with a **single tool holder**, and are interchangeable.

### Onecut



Offers cutters with steel or carbide tips, compatible with near all Gravotech machines.

### Percut



Designed to meet **productivity and endurance** requirements. The range offers short tools for applications requiring a collet or high-frequency spindle.

### Diamond



Combines delicacy and precision. They are compatible with scratch engraving projects, particularly on metals and glass. The Diamond range is divided into the Onecut and Twincut lines.

## TOP 5 MUST-HAVE TOOLS (TWINCUT RANGE)



### 22.5° Conical

The most versatile for everyday plastic engraving



### Conical double cone

The most powerful for metal engraving



### 30.0° Conical

A tool for detail engraving or fine engravings as in jewelry-making



### One lip

For fast, straight cuts



### 120° Faceted Rotating Diamond

Suitable for scribing glass or metals

Do you need more information?

Contact a Gravotech expert

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