# Selection of materials, rotation and feed speeds

For every engravable material there is an ideal feed (mm/sec) and speed (rpm) which yields an optimal engraving result. When engraving, try to respect each and every one of the following principles:

1. Use only sharp cutters. If your engraving results get poor, more than likely your cutter is dull, or has a broken tip. Use a good magnifying glass to regularly check the cutting edges of your cutters.
2. Only use high quality micro-carbide cutters.
3. Different materials may require different cutting angles. Make sure your cutter has the right angles for the material you intend to cut.
4. Never engrave deeper than is strictly necessary. For multi-layer plastics, the ideal depth is just enough to make the underlying colour appear. When you engrave metals which have to be paintfilled afterwards, you will need an engraving depth of 0.3 mm.
5. When engraving metals, especially if you do not use the nosecone, it is very important that the entire plate is fixed vibration-free to the engraving table. The perfect way to achieve this is using the vacuum table.

**Note:**

Always be careful at what you try to achieve. The tougher the material, the more careful you have to be. For example, engraving stainless steel is possible if you do not try to achieve excessive results. The Cyborg X-300 is a relatively lightweight engraver, which is not the same as a router. You can engrave stainless steel with a relatively small cutter tip (e.g. 0.5 to 1.0 mm) at moderate depths (e.g. 0.05 to 0.15 mm). You cannot engrave stainless steel with a 3 mm wide cutter tip at a depth of 0.5 mm or more. What you can and what you cannot do is very difficult to say, it depends upon many variables, under which the grade of stainless, the quality of the cutter, the cutting strategy, etc.

## Rotary engraving

The following materials can be rotary-engraved with the Cyborg X-300:

- All different kinds of ABS- and PMMA-based multilayer engraving materials, e.g. Graflux
- Phenolic engraving materials, such as Resopal
- Acrylic (PMMA) material
- All PVC engraving materials
- Anodized aluminium, engraving quality
- Engravers brass
- Stainless steel, engraving quality, use shallow depths, e.g. 0.1 mm.
- Aluminium-PE-aluminium sandwich panels, such as Alucobond and Dibond
- Aluminium-PP-aluminium sandwich panels, such as Hylite
- Different molding materials
- Wood and MDF

## Diamond scratching

Besides rotary engraving it is also possible to diamond scratch some materials:

- Stainless steel
- Pre-etched or anodized machine or motor tags
- Glass

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