Acrylic Cutting

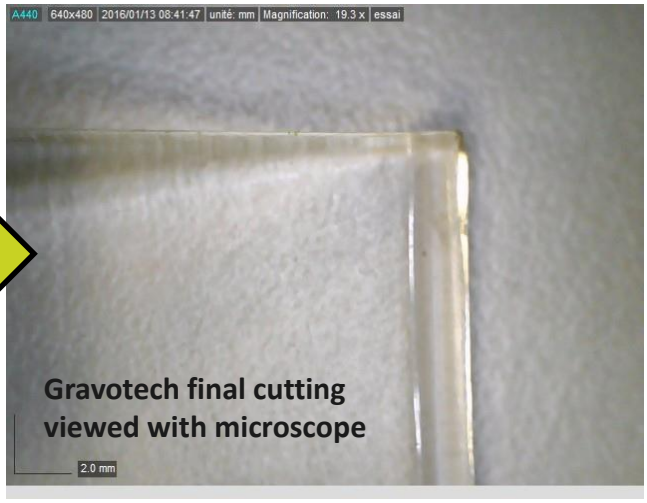
BULLETIN N°: APPSLAB1_16001_ACRYLICCUTTING

Diffusion: Gravotech Group Subsidiaries

Date: 04/07/2016

Goal: Having a good surface and good edge when cutting Acrylic with CO_2 (150W)

⚠ Before starting, adjust laser: focal, asymmetry, alignment, tickle, backlash (see technical manual)



Parameters to set :

- **Cutting mode « vector » or «cutting»** → Chose Cutting mode in LaserStyle
- **Focale lens** → 4 inches
- **Focalisation (mm)** → Focus must be inside the material
- **Laser power (W)** → Highest power before flames appearance
- **Cutting speed (m/s)** → Slowest cutting speed before flames appearance
- **Number of passes** → Single pass
- **Frequency (kHz)** → 42kHz (to set up at the machine start-up)
- **Airflow position « axially » or «radially»** → Axial airflow
- **Airflow** → Minimum airflow before fire
- **Part support** → Sleepers

Apps Lab solution

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Parameters for LS1000XP 150W with 4" lens

Acrylic thickness	10 mm	20 mm	25 mm
Power	62%	51%	100%
Speed	1.3%	0.5%	0.5%
Focus inside material	3.8 mm	4.6 mm	5.2 mm

To change frequency: when the machine starts up, laser parameters / cutting frequency

If you get this result, this is what you have to change :

Poor side condition (streaking) → cutting mode, laser power, cutting speed, frequency

Poor edge → focalisation, laser power, cutting speed, airflow position

Sticking → laser power, cutting speed

Poor top of the part condition → airflow rate, airflow position

Poor bottom surface condition → Part support

Tips & tricks :

- Be sure the exhaust suction is correct.
- Let the part cool down before taking it off: otherwise parts are often stuck together.
- Avoid beam reflections on the support: risk of fire and bad bottom surface conditions.
- Avoid the part falling down at the end of the cutting.
- Use the minimum air.
- Avoid shapes with sharp angles: the material will heat up and result won't be homogeneous.
- Spread the start and end points of 0.1 mm or 0.2 mm to reduce the edge defect.
- The start and end points must be located in a hidden corner.
- When machining a batch of parts, be careful not to cut two pieces side by side or at least make a pause between them.

For more information, write to samples.marking@gravotech.com