



ADVANCED CHEMICAL ETCHING LTD

# STAINLESS STEEL



## STAINLESS STEEL ETCHING

**Advanced Chemical Etching (ACE) is a market leader of precision Stainless Steel etching; we chemically etch millions of components each month using a wide variety of different grades, such as the Austenitic (300 series) and Martensitic (400 series) steels.**

When parts are etched in Stainless Steel the process does not affect the mechanical properties of the metal, meaning the steel remains unaltered by the process. Areas of the surface can be etched or reduced and the metal shows not distortion or warping. Multi complex profile shapes can be etched and the edges will remain burr free.

ACE can etch in thicknesses of 0.005mm to 1.5mm in all Stainless Steel grades (Austenitic, Ferritic, Martensitic, Precipitation Hardened Steels and Duplexes), in hardnesses from soft (annealed) to ultra hard and to a maximum sheet size of 1500mm x 600mm.

### CORROSION RESISTANT

**Stainless Steel** is a preferred metal due to its **outstanding corrosion and oxidation resistance** which, along with other properties such as **excellent formability** and **capability to withstand cryogenic temperatures** make it **one of the most popular metals etched at ACE** with millions of parts in different thickness, grades, finishes and hardnesses etched each month.

### MULTI-PURPOSE

Due to its **versatility**, Stainless Steel is **used in a wide variety of products in many industry sectors.**

### BENEFITS OF THE ETCHING PROCESS

**GO-TO PROCESS** – Low set-up costs and incredibly fast lead times make etching a go-to process in batch sizes of ones to millions

**LOW-COST TOOLING** – The tooling for etching Stainless Steel is digital, low-cost and can be modified quickly

**NET SHAPE** – No heat or force is used when processing Stainless Steel, so the mechanical properties of the metal remain unaltered and parts are free from stresses and burrs

**ANY COMPLEXITY** – Component features are etched at the same time so part/feature complexity is not an issue.

Contact ACE today on **+44 (0)1952 416 666** to find out what we could produce for you – whether it's 1s or millions.

## TYPICAL ETCHED COMPONENTS

- » Springs and flexures
- » ABS braking shims
- » Heat exchanger plates/shims
- » Biosensors
- » Fuel injection nozzles
- » Complex micro-filters
- » Metal enclosures and fascia panels with etched detail
- » Shims and washers for aerospace applications
- » Automotive Interior Trim (Speaker grilles/Tread plates)
- » Diaphragm springs for fuel management systems in the automotive sector
- » Multi-stage profiled cutting blades for the medical industry
- » Flapper Valves

**A PROCESS OF INNOVATION**

# METAL GRADES FOR STAINLESS STEEL ETCHING

## TECHNICAL CAPABILITY

GRADES	THICKNESS RANGE	MAXIMUM SHEET SIZE
<b>Austenitic Grades</b>		
1.4310 (301)	0.005mm – 1.500mm	600mm x 1500mm
1.4301 (304)	0.005mm – 1.500mm	600mm x 1500mm
1.4307 (304L)	0.005mm – 1.500mm	600mm x 1500mm
1.4845 (310/310S)	0.005mm – 1.500mm	600mm x 1500mm
1.4401 (316)	0.005mm – 1.500mm	600mm x 1500mm
1.4404 (316L)	0.005mm – 1.500mm	600mm x 1500mm
1.4571 (320/316Ti)	0.005mm – 1.500mm	600mm x 1500mm
1.4541 (321)	0.005mm – 1.500mm	600mm x 1500mm
1.4450 (347)	0.005mm – 1.500mm	600mm x 1500mm
1.4539 (904L)	0.005mm – 1.500mm	600mm x 1500mm
1.4310 (301)	0.005mm – 1.500mm	600mm x 1500mm
<b>Ferritic Grades</b>		
1.4016 (430)	0.005mm – 1.500mm	600mm x 1500mm
1.4113 (434)	0.005mm – 1.500mm	600mm x 1500mm
<b>Martensitic Grades</b>		
1.4006 (410)	0.005mm – 1.500mm	600mm x 1500mm
1.4028 (420)	0.005mm – 1.500mm	600mm x 1500mm
Sandvik 7c27m02, 13C26, 12C27, 6C27	0.005mm – 1.500mm	600mm x 1500mm
Uddeholm 716 & 20C	0.005mm – 1.500mm	600mm x 1500mm
<b>Cold Rolled Low Carbon (Mild) Steel</b>		
1.033 (CS4)	0.005mm – 1.500mm	600mm x 1500mm
1.0347 (CS2)	0.005mm – 1.500mm	600mm x 1500mm
1.0338 (DC04)	0.005mm – 1.500mm	600mm x 1500mm
<b>Cold Rolled High Carbon (Spring) Steel</b>		
1.1231 (C67S)	0.005mm – 1.500mm	600mm x 1500mm
1.1248 (C75S)	0.005mm – 1.500mm	600mm x 1500mm
1.1274 (C100S)	0.005mm – 1.500mm	600mm x 1500mm

## PROCESS CAPABILITY

METAL THICKNESS	MINIMUM SLOT / HOLE	BAR	MINIMUM INTERNAL RADIUS	MINIMUM EXTERNAL RADIUS	MINIMUM TOLERANCE	ETCH PROFILE CUSP
0.050mm	0.100mm	0.100mm	0.050mm	0.040mm	±0.025	0.012mm
0.100mm	0.110mm	0.110mm	0.100mm	0.080mm	±0.025	0.025mm
0.150mm	0.170mm	0.170mm	0.150mm	0.120mm	±0.025	0.030mm
0.200mm	0.220mm	0.220mm	0.200mm	0.160mm	±0.025	0.040mm
0.250mm	0.275mm	0.275mm	0.250mm	0.200mm	±0.030	0.050mm
0.500mm	0.550mm	0.550mm	0.500mm	0.400mm	±0.055	0.100mm
0.700mm	0.770mm	0.770mm	0.700mm	0.560mm	±0.077	0.140mm
1.000mm	1.100mm	1.100mm	1.000mm	0.800mm	±0.110	0.200mm
1.500mm	1.650mm	1.650mm	1.500mm	1.200mm	±0.165	0.300mm