

## Inconel Seal – Laser welding case study

Inconel is difficult to machine mechanically, but laser cutting with a pico-laser provides a good-quality high precision surface for sealing.

A 1.8mm diameter hole is drilled mechanically through an Inconel plate. In order to create a mechanical seal between a ceramic cone shape and the entry to the hole, to prevent liquid incursion under high pressure, a chamfer around the hole is required to be cut, without burrs and at a precise angle to match that of the ceramic cone.

A picosecond fibre laser source is used to create a highly focussed beam which cuts through the Inconel, leaving a smooth surface which requires no further machining. This “cold-ablation” process is useful for drilling small holes and micro-machining, as well as scribing and cutting a wide variety of materials and metals such as molybdenum, platinum, nickel, titanium and nitinol. Applications include semiconductor and bio micro-fluidic devices.

