



## WATERJET CUTTING AND ENGRAVING



### TECHNICAL DATA

WaterJet cutting system	<b>ByJet Pro L 4030</b>
Nominal sheet size	x = 4000 mm, y = 3000 mm
Cutting range	x = 4048 mm, y = 3068 mm, z = 250 mm
Tolerance	Machine precision according to VDI/DGQ 3441
Numer of cutting heads	2
High-pressure pump	By Pump Active
Max. operating pressure	3800 bar
Maximum workpiece thicknesses	200 mm

### SOFTWARE

WaterJet	ByVision
Nesting	Bysoft 7



## WATERJET CUTTING AND ENGRAVING

At its most basic, water flows from a pump, through plumbing and out a cutting head. It is simple to explain, operate and maintain. The process, however, incorporates extremely complex materials technology and design.

### A. WHY USE WATERJET

#### *Unmatched Versatility*

Waterjets enable you to cut a variety of applications with ease. Whatever the shape, dimensions, or material, our easy-to-use software makes the job easy.

#### *Expanded Capabilities*

Whatever your business - automotive, aerospace, stone and tile, tool and die, gaskets, fabricator, or job shop - you can cut metal, stone, plastics, composites, glass, ceramics, rubber and more. Zip through materials up to 150 mm thick with no heat-affected zone and superior edge quality.

#### *Reduced Material and Production Costs*

Waterjets require minimal fixturing and tooling so you can save valuable time on your shop floor. Waterjets cut accurate, clean edges that allow for tight nesting and reduced scrap - saving you money through greater material utilization.

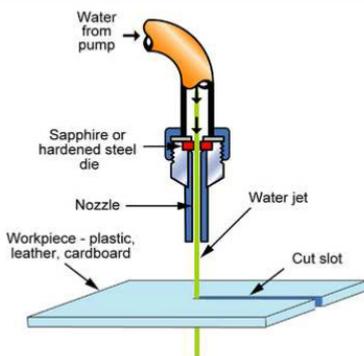
#### *Complements Existing Technology*

Many job shops add waterjets to their operations alongside other cutting technologies such as EDM, laser, milling and plasma. While each shop has its own requirements for cutting projects, most are finding waterjets to be a tremendous asset to their operations - enhancing both productivity and profitability.

### B. CUTTING PROCESS

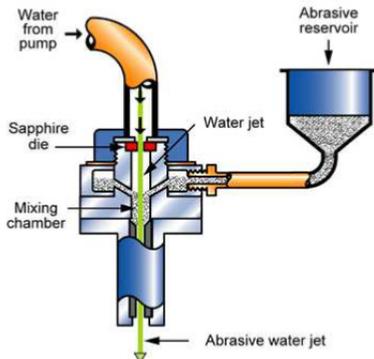
Essentially, there are two types of waterjet cutting processes:

#### I. Pure water jet cutting



With pure water jet cutting, the cutting tool is a water jet formed in a sapphire, ruby or diamond nozzle. Its erosive effect is used to remove material. As its cutting power is very limited for hard materials, it is often used for soft materials. This includes materials such as plastics, textiles, paper products, seal materials, metal foils, foam, food products or thin plywood. The advantage of pure water jet cutting is its high precision. The width of the cutting gap can be reduced to just 0.08 mm. This allows for the production of complex geometries with fine contours, acute angles and tight radii.

## II. Water abrasive injection jet cutting



Water abrasive injection jet cutting uses a water jet that is accelerated through the first nozzle, called a “water nozzle”. The high speed of the water jet produces low pressure in the subsequent mixing chamber, which causes the CNC-controlled, finely-dosed abrasive material to be pulled into the water jet. The abrasive material is not pressurized. The mix is then accelerated through a second nozzle, the “abrasive nozzle”. This nozzle, also called the focusing tube, is generally made of hard metal. The cutting power of the water abrasive injection jet method is based on the final speed of the abrasive particles. The jet diameter and the width of the cutting gap are between 0.5 ... 1.5 mm. The grain of the abrasive is approx. 0.05 ... 0.3 mm. Depending on the cutting application, the abrasive usage is 1 ... 700 g / min.

## C. ADVANTAGES AND APPLICATIONS

Advantages - Waterjets can cut any solid material including stone, tile, glass, metal, foam, rubber, plastic, and food. When compared with plasma, laser, and edm - waterjet cutting has distinct advantages:

- Extremely versatile process
- No Heat Affected Zones
- No mechanical stresses
- Easy to program
- Thin stream (08 to 1.2 mm in diameter)
- Extremely detailed geometry
- Thin material cutting
- 150 mm thick cutting
- Stack cutting
- Little material loss due to cutting
- Small tangential forces on cut material
- Low cutting forces
- Easily switched from single to multi-head use
- Little or no burr
- No dust, fumes, or gases released

