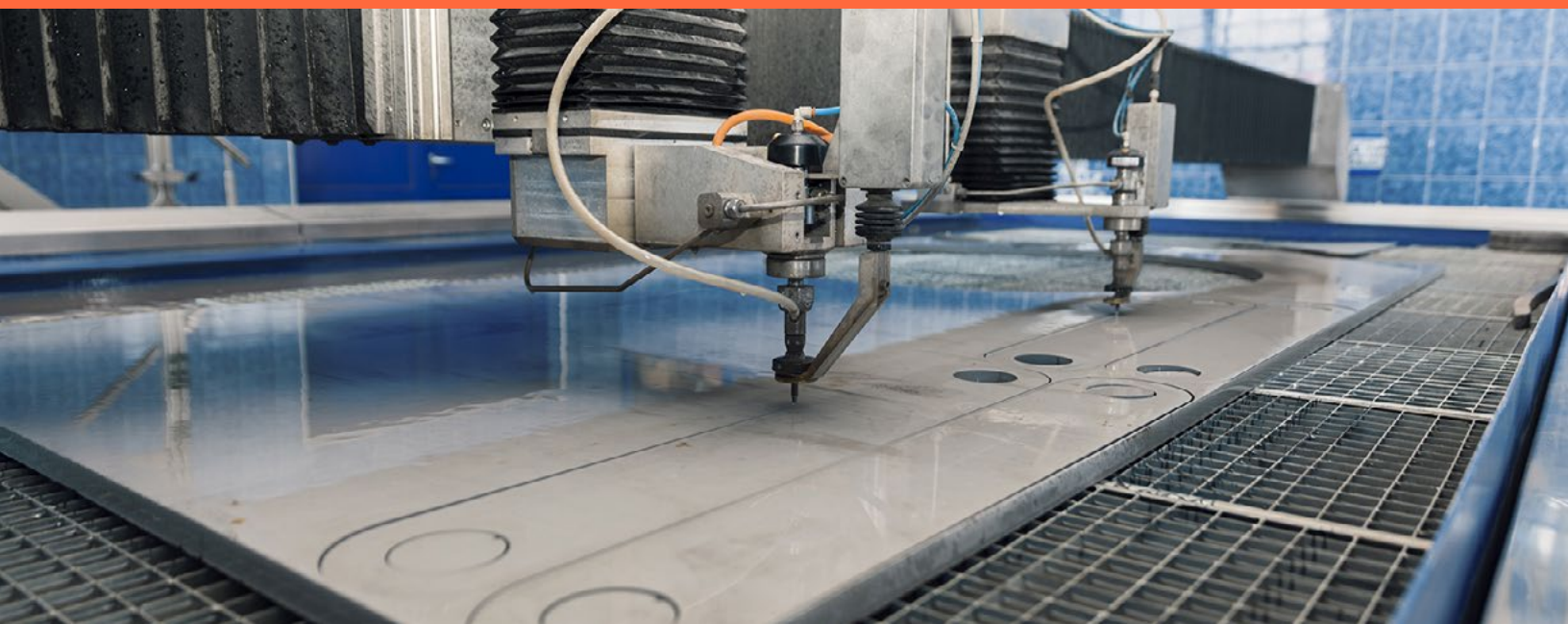


A close-up photograph of a waterjet cutting head in operation. The head is a complex assembly of dark metal parts, including a nozzle at the bottom. A high-pressure water jet is being directed at a piece of metal, creating a large splash of white water and a misty spray. The background is dark and out of focus, showing the industrial setting. The top of the image has a dark, textured border.

# Waterjets

*Simplicity & Flexibility*

Waterjet cutting has been a specialty technology used in a wide variety of industries from mining to food processing since around the early 1950's. In the 1980's, a high pressure water jet stream was mixed with an abrasive material and a new revolution in shape cutting was born, Abrasive Waterjet Machining. This discovery of added abrasive to the high pressure jet stream literally grinds through any material it comes in contact with. The jet stream acts like a bandsaw blade with the abrasive acting like the teeth on the blade. Over the next decade the process was honed into a precision cutting technology for not only sheet metal but literally any material at all. Using Garnet Abrasive and water the effective waste stream is a non-hazardous silty like mud water peppered with finely ground shavings of the cut material. Waterjet can process many materials like steel, aluminum, plastics, wood, carpet, foam, tiles, stone and literally anything you can touch.



The environmental friendliness and ease of operation of a water jet cutting system also make them very appealing to the novice and expert shops alike. Typically the only information required for a waterjet is the shape file in DXF format then the operator inputs the type, thickness and precision of cut desired. Because of the simplicity and flexibility there are now many companies replacing or complementing their existing methods of operation with water jet cutting methods as this is an accurate method for cutting that produces no hazardous fumes or waste and is NOT a thermal process so heat sensitive parts like plastics are not damaged or destroyed in the machining process. Today waterjet technology is capable of producing cutting pressures in excess of 90,000 PSI (90kpsi).

Waterjets are defined by three major factors; table/travel size, pressure and horsepower. A typical waterjet system will have a table travel of 5' X 10' or 6' X 12' an operating pressure of 55-60,000 psi ( 60 KPSI ). Pump pressure and the volume of water produced at that pressure can have a major impact on not only the performance of the machine but also on the operating costs. As an example, a pump operating at the pressure of 40 KPSI may be a few less dollars to run per hour but can literally take twice as long to cut the same part to the same quality as that very same machine operating at 60 KPSI, thus doubling the manufacturing cost. In another example a pump producing 60 KPSI utilizing a 30hp Intensifier Style Pump will produce .6 gallons per minute (or gpm) of pressurized water. The same machine operating at the same pressure (60 KPSI) but utilizing a 60HP pump will produce 1.2 gpm of pressurized cutting water which will allow the operator to increase the speeds of the very same part, to the very same tolerances by 40%.





Either type of high pressure pump can be employed to cut using Straight Water or Abrasive Water Jet. Any Abrasive Waterjet Machine can be utilized as a Straight Water machine simply by eliminating the abrasive mixture, however machines designed for Straight Water cutting operations may require significant modification to utilize abrasive machining methods. Typical applications for each are listed below:

**Straight Water:** Used for applications that can be cut with a knife or scissors such as food processing, paper, carpet, foam, fiberglass insulation, gaskets etc.

**Abrasive Jet Machining:** Metals, plastics, tile, stone, granites and any other materials that are not easily cut.

Materials Processed with this method include, but are not limited to:

- Steel
- Aluminum
- Stainless
- Copper
- Brass
- Plastics
- Foam
- Gaskets
- Insulation
- Carpet
- Glass
- Tile
- Stone
- Wood

Popular Waterjet Manufacturer's include, but are not limited to:

- American Waterjet
- Bystronic
- Calypso
- Esab
- Flow
- Omax
- Jet Edge
- Ward Jet
- Hydra Jet
- Romeo Engineering
- Wardjet

Techni Intech  
i612-G2 Waterjet  
Cutting System



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