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WATER JET CUTTING TECHNOLOGY

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ABSTRACT

Water jet cutting is simply a quick erosion process inside the selected material. High-pressure water is extracted through a ruby or a diamond pipe into the mixing chamber. This pressure creates a vacuum and draws garnet sand into the stream where it is blown into an object placed in a cutting area. Sand particles feed on substances that cause erosion to occur at high speeds and are considered cutting. This has allowed the cutting of the water jet to become a powerful and versatile tool used in many industries around the world.

- A machine tool that uses a jet of compressed water containing crawling powder to cut metal and other compact materials.
- The process is similar to the erosion of water found in nature.

Keywords: Vacuum, Versatile, Crawling, Garnet, Jet.

I. INTRODUCTION

Water Jet cutting uses very high water pressure to carry dry grit. The abrasive is made by cutting with a saw, leaving a smooth, precise cutting surface. The water jet is a very flexible process, as it can cut almost any type of material. The limits include the most delicate materials, such as hot glass and other pottery. Water jet is a very precise cutting process. It has a small kerf width, which allows fine contours to be cut, and produces more tolerant parts. However, the process is slower, more expensive compared to plasma in most metals. One of the most flexible mechanical processes. Recommends other technologies such as grinding laser, plasma and oils. Cold cold cutting process - no HAZ, machine presses.

1. Water jet Cutter

A water jet cutter is a machine made up of three main parts to use a high-pressure water stream to erode a thin line between the goods. Depending on the amount of material and compounds such as titanium abrasive granular are added to the water jet to increase cutting strength. Abrasive was added to the nozzle so that only a simple switch between water and harmful cutting could be made.

2. Principle of Water Jet Cutting Technology

The cutter is usually connected to a high-pressure water pump, where water comes out of the nozzle, disconnected by spraying it with a high-speed water jet. It is useful to use it to cut any type of material. In a water jet cut, no heat is generated. This is especially helpful in cutting tools and other tools where extreme heat may change the texture of the material. Cutting the water jet does not leave a burr or rough edge, and

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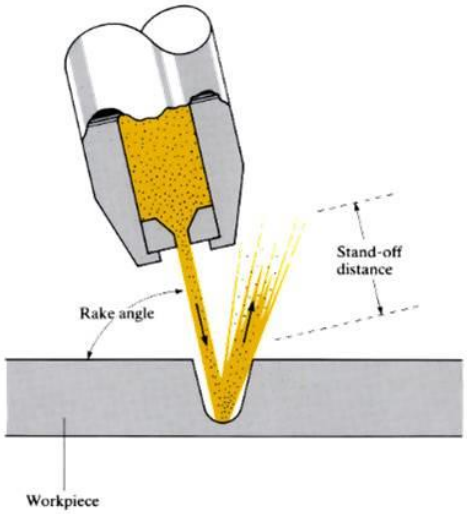
eliminates other mechanical functions such as cutting and grinding. It can be automated to be used in production.



3. Components

The water plane is more than just water and pressure. The shape cutting system contains:

• Ultrahigh-Pressure System

Includes pump, cutting head and pipes

• Machine

Including X, Y, Z axes, cutting head axes, and supporting grips

• Control System

includes editing software, user interface, drive engines, and position and speed response system.

4. Types of Water Jet Cutting

There are two types of water jet cutting

1. Pure water jet cutting.
2. Abrasive water jet cutting

1. Pure water jet cutting

- Cutting a jet of clean water involves using only water for cutting - unlike abrasive cutting. Items such as wood or rubber are good examples of using clean water jet cutting. Over the past few years the cutting of the water jet has completely changed in the complex industry - and only high-end products full of innovation, user experience, design and accessibility have been able to prove themselves.
- At ThyssenKrupp Industrial Solutions we consider it very important to cut the water jet. We know that it is used in important parts of the manufacturing processes of various industries. Our experienced team of engineers inspired by our expertise and solutions has created high pressure bar pumps with up to 6000 bar for this purpose.

2. Abrasive water jet cutting

- Cut the abrasive water jet using explosive particles (eg garnet) added to high pressure water to cut solid objects. Particle abrasive is added to the water in a jet cutting machine nozzle. In this process, exploding particles actually do the job of cutting objects. The role of water is to accelerate the particle abrasive at the right speed to cut and direct the particles to the selected cutting area.
- The efficiency of cutting can be improved by increasing the water pressure, thereby speeding up the flow of water and particles at a faster rate, or by increasing the flow rate of water and particles, thereby increasing the impact of particles on matter. The abrasive water cutting jacket is suitable for solid or thick materials such as metal, stone, or thick plastics.

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II. FUTURE OF WATER JET AND INNOVATION

Fast-growing mechanical process One of the most flexible methods of machinery Recommends other technologies such as grinding laser, plasma and grease. Real cold cutting process - no HAZ, machine or operator pressures and environmental hazards

There is no limit to machine verification. We are focused on overtime. We believe there are many opportunities to reduce costs and increase productivity by reducing operating costs and dealing with maintenance by planning instead of working in vacation repair mode. We are working to reduce the time it takes to service the system while expanding the repair times so that product manufacturers can spend more time cutting. Unexpected disruption during production can lead to the need for costly disposal and loss of productivity.

III. RESULT

Water jet cutting is the process by which objects are cut with a high-pressure water jet. Water jet cutting is used, for example, in the air workplace and in vehicles to better adjust the conditions and components. With very strong materials, granular abrasive is added to the water jet to increase cutting strength. Almost any material can be cut with water jet cutters. For example, plastics, metals such as metals, alloys, titanium and copper, rubber, glass, concrete, pottery and stone.

IV. CONCLUSION

New technologies are rapidly participating and replacing old production methods. It is used not only in machinery applications, but also in the food and soft goods industries. As material and pump technology rapidly develops cutting standards, the life of long parts and strong tolerance will be achieved.

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