WHAT ARE THE TYPES OF LASER CUTTING PROCESS

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Category: Laser Cutter News

There are several types of laser cutting processes:

1. Vaporization cutting

Under the heating of the high-power-density laser beam, the temperature of the surface of the material rises to the boiling point so fast that it is enough to avoid melting caused by heat conduction, so part of the material is vaporized into steam and disappears, and part of the material is ejected from the bottom of the kerf as a jet. Auxiliary gas flow blows away.

2. Fusion cutting

When the power density of the incident laser beam exceeds a certain value, the inside of the material at the point where the beam is irradiated will evaporate and form holes. Once this pinhole is formed, it acts as a black body and absorbs all the energy of the incident beam. The small hole is surrounded by molten metal walls, and then, the auxiliary gas flow coaxial with the beam carries away the molten material around the hole. As the workpiece moves, the small hole moves synchronously along the cutting direction to form a kerf. The laser beam continues to shine along the leading edge of the slit, and molten material is blown away from the slit in a continuous or pulsating manner.

3. Oxidation fusion cutting

Fusion cutting generally uses inert gas. If it is replaced by oxygen or other active gas, the material is ignited under the irradiation of the laser beam, and has a violent chemical reaction with oxygen to generate another heat source, which is called oxidation fusion cutting.

4. Controlled fracture cutting

For brittle materials that are easily damaged by heat, high-speed and controllable cutting is performed by laser beam heating, which is called controlled fracture cutting. The main content of this cutting process is that the laser beam heats a small area of brittle material, causing a large thermal gradient and severe mechanical deformation in this area, resulting in the formation of cracks in the material. As long as a uniform heating gradient is maintained, the laser beam can direct cracks in any desired direction.