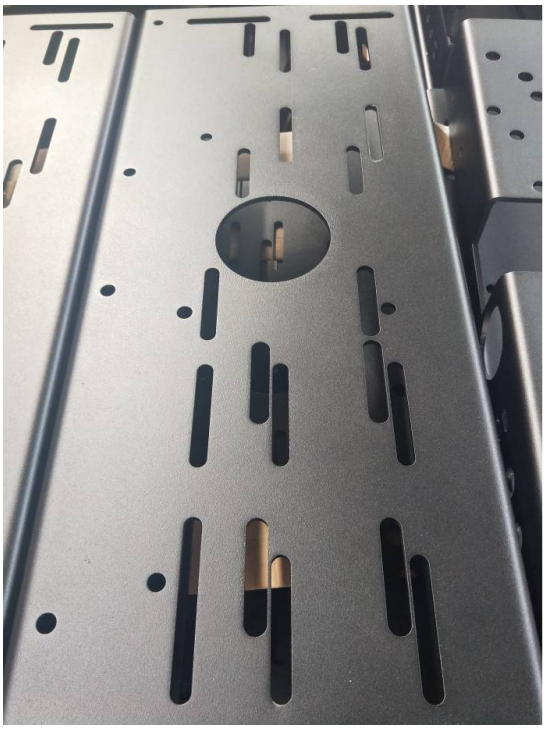
What is sheet metal processing, and what are its main applications?

Detail Introduction :

(1) The simple sheet metal processing can be summarized as the design or custom processing of stainless steel, iron plate, aluminum alloy plate, galvanized plate, and other materials.
(2) The sheet metal processing procedures include seven processes of blanking, fitter, flanging, stamping, riveting, bending, and welding. The blanking includes shearing, punching, NC numerical control blanking, and laser blanking. According to the process division, sheet metal processing includes laser, CNC punching, CNC bending, reel, etc.
(3) The application industry of sheet metal processing is mainly based on manufacturing, but it is involved in almost all walks of life. Sheet metal processing products mainly include automation equipment shells, engineering assembly lines, kiln sheet metal, precision mechanical parts, etc.

laser cutting

Laser cutting focuses the laser light emitted into a high-power density laser beam through the optical path system. The laser beam irradiates the surface of the workpiece to make the workpiece reach the melting point or boiling point, and the high-pressure gas coaxial with the beam blows away the molten or vaporized metal.
As the relative position of the beam and the workpiece moves, the material will eventually form a slit to achieve cutting.



CNC punch

Numerical control punch is the abbreviation of digital control punch, an automatic machine tool equipped with a program control system. Through the control system to control the action of the punch, drive the punch to work and process parts.
Both laser cutting and digital punching processing are flexible processing, adapting to today's small batch and various types of market needs.
Advantages and disadvantages of laser cutting and digital punching:

Classification	Processing methods	Machinable materials	Precision	Cost
laser cutting	No mold is needed, and any shape can be processed (hot processing)	Steel type (aluminum plate processing efficiency is low), can process plates of any thickness	High processing accuracy, fewer burrs	high
CNC punching	Need to be equipped with punch die, special shape needs to be customized punch, can process convex hull, wire bridge (cold processing)	Can process all kinds of materials, not suitable for processing materials with a thickness of more than 3 mm	High processing accuracy, continuous mold maintenance, and many burrs	lower

CNC bending

The bending machine uses hydraulic transmission to drive the relative movement of the upper and lower body, combined with the shape of the upper and lower bending molds to realize the bending of the flat plate around the bending line into a part with a certain bending angle and bending radius.
Features of bending machine:
1. Different bending upper and lower dies can be used to process parts of different shapes;
2. High processing efficiency;
3. Limited by the bending mold, there are requirements for the minimum bending edge, crack arrest groove, etc., and closed parts cannot be bent.
5. The bending dimensional accuracy is affected by manual operation.

Pressure riveting

Pressure riveting uses special equipment and special tooling molds to apply force to the required pressure riveting parts so that they can be completely pressed or embedded in the workpiece. It can ensure its firm, verticality, and flatness.
Characteristics of pressure riveting process:
1. The opening size of the bottom hole of the pressure riveting is strictly processed by the opening size of the plate corresponding to each pressure riveting piece;

2. When pressing riveting, adjust the appropriate pressure so that the riveting piece is completely embedded in the plate to ensure flatness and perpendicularity;
3. Different pressure riveting parts can realize high processing efficiency, positioning, connection, and other functions.

Drilling, countersinking

Bench drilling machines are mainly used for drilling, reaming, countersinking, and tapping small and medium-sized parts.
The drilling diameter of the bench drilling machine is generally below 13 mm, and the smallest hole that can be processed is less than 1 mm, generally not more than 16 mm.

Tapping

A tapping machine is a machine tool that uses taps to process internal threads, and it is the most widely used internal thread processing machine tool.
According to different driving power sources, tapping machines can be divided into hydraulic tapping machines, electric tapping machines, and pneumatic tapping machines;
The number of spindles of the tapping machine can be divided into single-axis tapping machine, two-axis tapping machine, multi-axis tapping machine, etc. A multi-axis tapping machine can improve processing efficiency and quality.

Welding

Welding is a common processing technology in modern industrial production, and the commonly used welding method in sheet metal processing is fusion welding.
Fusion welding is to heat the weldment joint to a molten state, and the weld is formed after condensation so that two pieces of material are welded together, such as arc welding, submerged arc welding, gas welding, etc.
Welding is a local rapid heating and cooling process. After cooling, welding stress and deformation are generated in the weldment.
Important products need to eliminate welding stress and correct welding distortion after welding.