

# How are metal stamping parts manufactured?

## Detail Introduction :

A stamping process makes metal stamping parts. **The stamping process** is a method of deforming or separating the workpiece plate blank through a die to obtain a workpiece with a certain size, shape, and performance. The stamping and drawing process should be combined with the actual situation, and a reliable process plan should be selected. The following briefly introduces how the metal stamping parts are manufactured:

### 1. Process characteristics of metal stamping parts

- (1) The stamping method can obtain workpieces with complex shapes. The mold guarantees the dimensional accuracy of cold stamping parts, so the dimensions are stable.
- (2) The material utilization rate is high, the weight of the workpiece is light, and the strength is high, and the stamping process consumes less energy, so the process investment is low.
- (3) Simple operation, low labor intensity, easy to realize mechanization and automation.
- (4) The die structure used in stamping is generally more complicated, and the manufacturing cycle is longer.

### 2. Process division of metal stamping parts

A die is a tool that separates or deforms the sheet material. It consists of an upper die and a lower die. According to the die structure, the process can be divided into simple stamping, continuous stamping, and compound stamping.

- (1) Simple stamping is a stamping process that only completes one process in one stroke of the punch. It is a simple die for blanking or punching.
- (2) Continuous stamping is the process of completing several stamping processes on different parts of the mold at the same time in one stroke of the punching machine, and the feed distance is controlled by the stopper pin each time.
- (3) Compound stamping is to complete several stamping processes on the same part of the mold at the same time in one stroke. The biggest feature of compound stamping is that there is a convex and concave die in the mold. The compound die is suitable for stamping parts with large batches and high precision.

### 3. Material selection of metal stamping parts

Common **metal stamping plates** are low-titanium alloys, magnesium alloys, carbon steel stainless steels, aluminum, copper, and their alloys, etc. They have high plasticity and low deformation resistance and are suitable for metal stamping processes.

- (1) Copper, aluminum, and their alloys have good ductility and excellent electrical conductivity, so this type of stamping process is often used as a component of electrical equipment.
- (2) The stamping process of carbon steel and stainless steel is often used to manufacture equipment shells, structural parts, cabinets, etc., but stamping oil is usually used to improve the process due to its strong rigidity.
- (3) Titanium alloy stamping is mainly used in scenes that require small weight and high strength, such as large equipment, aircraft, ships, satellites, etc. The process is difficult, so special stamping oil must be used to improve the process level when stamping.

### 4. How to choose metal stamping oil

Stamping oil plays a key role in the stamping process. Good cooling performance, extreme pressure, and anti-wear performance have made a qualitative leap in the service life of the mold and the improvement of the accuracy of the workpiece. Depending on the material of the workpiece, the performance focus of the stamping oil is different when it is selected.

(1) **Silicon steel plate** is a material that is relatively easy to punch. Generally, for the ease of cleaning of the finished product, low-viscosity punching oil is used on the premise of preventing punching burrs.

(2) When selecting stamping oil for **carbon steel plates**, the best viscosity is determined according to the process difficulty, oil feeding method, and degreasing conditions.

(3) **The galvanized steel sheet** chemically reacts with chlorine-based additives. Therefore, when the galvanized steel sheet is selected for stamping oil, attention should be paid to the problem of white rust that may occur in the chlorine-based stamping oil. The use of sulfur stamping oil can avoid the problem of rust, but it should be degreased as soon as possible after stamping.

(4) **Stainless steel plate** is a material that is prone to hardening, and it is required to use drawing oil with high oil film strength and good sintering resistance. Generally, stamping oil containing sulfur and chlorine compound additives is used to avoid burrs and cracks on the workpiece while ensuring extreme pressure performance.