Generally speaking, customers who have been in the injection molding industry for many years have the ability to judge for themselves and choose the right injection molding machine to produce. However, in some cases, the customer may need the assistance of the manufacturer to decide which type of injection molding machine to use. The customer may even only have a sample or idea of the product, and then ask the manufacturer if the machine can be produced or which model is suitable.
In addition, some special products may require special devices such as accumulators, closed loops, injection compression, etc., to be produced more efficiently.
It can be seen from this that how to choose the right injection molding machine for production is an extremely important issue. The following information is for reference.
The most important factors that usually influence the choice of injection molding machine include mold, product, plastic, molding requirements, etc.
Therefore, the following information must be collected or available before making a selection:

1. Mold size (width, height, thickness), weight, special design, etc.;
2. The type and quantity of plastics used (single raw materials or multiple plastics);
3. The appearance size (length, width, height, thickness), weight, etc. of the finished injection molded product;
4. Molding requirements, such as quality conditions, production speed, etc.

Once you have the above information, you can follow these steps to select the right injection molding machine:

1. Choosing the right type

The model and series are determined by the product and plastic.
Since there are many types of injection molding machines, it is first necessary to correctly judge which injection molding machine or series this product should be produced by. For example, general thermoplastic or bakelite raw materials or PET raw materials, etc., it is monochrome, two-color, multi-color, sandwich or mixed color, etc.
In addition, some products require conditions such as high stability (closed loop), high precision, ultra-high rate of fire, high radiation pressure, or rapid production (multi-circuit), etc., and the appropriate series must be selected for production.

2. Put down

Determine whether the â□□large column inner distanceâ□□, â□□mold thicknessâ□□, â□□minimum mold sizeâ□□ and â□□mold plate sizeâ□□ of the machine machine are appropriate by the mold size to confirm whether the mold can be placed down.

1. The width and height of the mold must be less than or at least one side less than the inner distance of the large column;
2. The width and height of the mold should preferably be within the mold plate size range;
3. The thickness of the mold should be between the mold thickness of the injection molding machine;
4. The width and height of the mold must meet the minimum mold size recommended by the injection molding machine. It is not OK to be too small.

3. Take it out

It is up to the mold and the finished product to determine whether the â□□mold opening strokeâ□□ and â□□mold holding strokeâ□□ are sufficient for the finished product to be removed.

1. The mold opening stroke must be at least twice the height of the finished product in the direction of the switching mold, and the length of the vertical sprue must be included;
2. The mold holding stroke should be sufficient to eject the finished product.

4. Lockable

The tonnage of â□□clamping forceâ□□ is determined by the product and plastic.
When the raw material is injected into the mold cavity at high pressure, a mold support force is generated, so the mold clamping unit of the injection molding machine must provide sufficient â□□clamping forceâ□□ to prevent the mold from being opened.
The clamping force requirement is calculated as follows:

1. Find the projected area of the finished product in the direction of the switching mode from the external dimensions of the finished product;
2. Mold support force = the projected area of the finished product in the direction of the switching mold (cm2) Ã□ the number of mold holes Ã□ the in-mold pressure (kg/cm2);
3. The pressure in the mold varies with the raw material. Generally, the raw material is 350~400kg/cm2;
4. The clamping force of the machine needs to be greater than the mold support force, and for the sake of insurance, the clamping force of the machine usually needs to be greater than 1.17 times the mold support force.

At this point, the specifications of the clamping unit have been initially determined, and the tonnage of the machine type has been roughly determined. Next, the following steps must be carried out to confirm which injection unit has a screw diameter that meets the requirements.

5. Full shot

The required â□□injection volumeâ□□ is determined by the weight of the finished product and the number of mold holes, and the appropriate â□□screw diameterâ□□ is selected.

1. To calculate the weight of the finished product, consider the number of holes in one mold (how many holes in one mold);
2. For stability, the injection volume should be at least 1.35 times the weight of the finished product, that is, the weight of the finished product must be within 75% of the injection volume.

6. Good shooting

The plastic determines the conditions of â□□screw compression ratioâ□□ and â□□injection pressureâ□□.
Some engineering plastics require high injection pressure and appropriate screw compression ratio design to have a good molding effect. Therefore, in order to make the finished product shoot better, the need for injection pressure and compression ratio should also be considered when selecting the screw.
Generally speaking, a screw with a smaller diameter provides a higher injection pressure.

7. Shoot fast

Confirmation of â□□injection speedâ□□.
Some finished products require high injection rate rapid injection for stable molding, such as ultra-thin finished products. In this case, it may be necessary to confirm whether the injection rate and rate of the machine are sufficient, and whether it needs to be equipped with accumulators, closed-loop controls, etc. Generally speaking, under the same conditions, a screw that can provide a higher injection pressure usually has a lower rate of fire, whereas a screw that can provide a lower injection pressure usually has a higher rate of fire. Therefore, when selecting the screw diameter, injection volume, injection pressure, and injection rate (injection speed), need to be cross-considered and trade-off.
In addition, a multi-circuit design can also be adopted to shorten the molding time by simultaneous compound action.
After these steps, in principle, it is possible to decide which injection molding machine meets your needs, but there are some special issues that may also need to be considered, including:

1. The problem of size matching

Under certain special circumstances, such as the customer's mold or product may have a small mold size but a large injection amount, or a large mold size but a small amount of radiation required, in such cases, the standard specifications set in advance by the manufacturer may not meet the customer's needs, and the so-called â□□size matchingâ□□, that is, â□□small wall shootingâ□□ or â□□small wall shootingâ□□ must be carried out.
The so-called â□□small wall injectionâ□□ refers to the original standard mold clamping unit with a smaller injection screw. Conversely, â□□small wall injectionâ□□ means that the original standard mold clamping unit is matched with a larger injection screw. Of course, there may also be several levels of difference between mold fitting and injection in terms of matching.

2. The concept of fast machine or high speed machine

In practical use, more and more customers will ask for the purchase of so-called â□□high-speed machinesâ□□ or â□□high-speed machinesâ□□. Generally speaking, in addition to the needs of the product itself, the purpose is to shorten the molding cycle and increase the output per unit time, so as to reduce production costs and improve competitiveness.
Generally, there are several ways to accomplish this:

- Fast injection speed: increase the motor and pump, or add a pressure accumulator (preferably closed loop control);
- Fast feeding speed: increase the motor motor and pump, or change the feeding hydraulic motor to a smaller size to speed up the screw speed;
- Multi-circuit system: adopt double circuit or three-circuit design to perform composite action synchronously, shorten the molding time;
- Increase the mold waterway and improve the cooling efficiency of the mold.

While machine performance improvements and modifications can increase productivity, they also often increase investment and operating costs. Therefore, pre-investment benefit assessments need to be carefully measured in order to produce the highest benefits with the most suitable model.