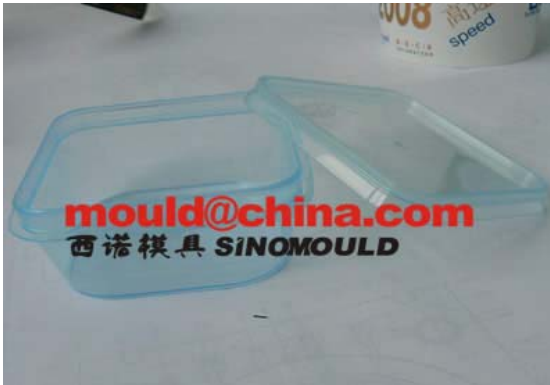


## Thin wall Injection Molding

**Thin wall Injection Moulding** has requirements on injection moulding machine, mould, and plastic. This article discusses the thin wall's characteristics, economic benefit, and device's design.

What's the **thin wall**?

In a simple view, when the wall's thickness is less than 1mm, it is called thin wall. More comprehensively, the definition of thin wall is related to the procedure /thickness ratio, the plastic viscosity and the heat transfer coefficient.



Mahishi and mabney make a definition on the thin wall like that the injection whose  $L/t=100$  or more than 150 is called thin wall injection moulding. L stand for the procedure from the mould's sprue to the farthest point of the product, and t stand for the product's thickness t.  $L/t$  is called the procedure /thickness ratio.

Why we need thin wall injection moulding?

The cost of plastic is always in the majority of product's cost, such as 50-80%. **Thin wall injection moulding** will reduce the cost. Due to consumptive electronic equipments such as cell phone, MP3, digital camera, palmtop computer, are smaller and more convenient, the related plastic parts are thinner.

Thin wall injection moulding machine.

Conventional injection moulding machine is difficult to be useful in the **thin wall injection moulding**. For example, the injection time of thin wall injection moulding is very short, it is unable to follow the speed curve in such a short period time. Therefore, an injection moulding machine with high-resolution MCU is necessary. In the whole thin wall injection moulding process, the pressure and the speed should be controlled independently. While conventional injection moulding machine is controlled by speed in the injection period and pressure in the holding period.



The barrel of **thin wall injection moulding** machine is smaller than it in conventional injection moulding machine. Because the thin wall products need less plastic materials, so if the barrel is as big as the usual one, it will result in the material's dissociation due to the long residence time. And each inject

35%-75% of the maximum injection volume is the best. It should be cautious to choose a thin wall injection moulding machinery company. [DAKUMAR](#) is a good choice.

The mould in thin wall injection moulding

The mould for **thin wall injection moulding** should be designed specially. The mould's structure, feed system, cooling system, venting system, and ejection system are all may change a lot.

### 1. Mould structure

In order to withstanding high pressure when moulding, **thin wall injection moulding** mould must have a large rigidity and a high intensity. So the bottom clamp plate, the top clamping plate and the support plate should be thicker than conventional mould. There are more locking and positioning mechanism in the mould to ensure the accurate positioning and good collateral support, and avoid bending and offset.



### 2. Feed system

When forming **thin wall** plastic product, especially the thickness of thin wall plastic product is very small, edge gate is necessary, and the gate should bigger than the wall thickness. If the gate is direct gate, it should set slag well to reduce gate stress and help filling, and ease the damage when wiping off the gate in the

same time. In order to ensure the enough pressure to filling the cavity, it should be to minimum the pressure drop in the runner system as far as possible, and the runner pressure drop should not upper than 15% of the pressure offered by injection machine. Therefore, the runner sectional area should be designed bigger than the usual one, and limiting the residence time of melting materials to avoid plastic dissociation.

Some feed system in **thin wall injection moulding** mould imports hot runner technology and sequence valve gate (SVG) technology. The hot runner technology enable the melting plastic provide high pressure at the gate after through a long path. However, the hot runner is easy to result in plastic degradation and degradation in a high temperature for a long residence time, so the residence time must be limited. SVG technology is a new class type hot runner control technology developed by U.S.,GE in the process of **thin wall injection moulding**. SVG can reduce moulding pressure efficiently. It plays an important role in producing large thin wall injection moulding plastic.

### 3. cooling system

**Thin wall injection moulding** plastic, unlike the conventional thin wall plastic, can't withstand the large residual stress which is created due to nonuniform heat transfer. In order to ensure the plastic dimension stability, and control the shrinkage and warpage in an acceptable range, we must strengthen the mould cooling to ensure the cooling balance.

4. venting system

**thin wall injection moulding** mould generally requires a good venting, it's best to operate in a vacuum. The mould's abundant venting, especially the venting in the flow front gathering area, is very important to prevent trapped gas ignition because of the short injection time and high injection speed.

5. ejection system

**Thin wall injection moulding** plastic's wall and tendons are thin, they are very easy to damage, the contraction along the thickness direction is small, and the high holding pressure make it to shrink smaller, these make the tendons and other small structure easy to glue. Thin wall injection moulding requires more and larger ejection pins when compared with conventional injection moulding.

Thin wall injection moulding mould requires a lot, but [SINO MOULD](#) do well in it. Their [thin wall high speed injection mould](#) is popular in the market.

(edit by SINO MOULD)