Comparing Sealers
Which one of the basic four sealers is for you?

There are four sealing methods depending on your purpose and usage. Sealers refer to machines in general that seal the opening or loose ends of plastic-film packaging materials, or bags. Sealers that use heat to fuse the sealing are called heat sealers.

Heat-sealing technologies for general use include the following:

1. Impulse sealer
2. Constant heat sealer
3. Ultrasonic sealer
4. High-frequency sealer.

While the description of the impulse sealer will be a review of the description on Page 4, here are the different types of sealers, explained in order.

(Reference: The Hoso Times, published by Nippo Co., Ltd.)

Do you want speed? Or do you want economical and safe features?

Constant heat sealers have seal blades that can be of various shapes, which, in turn, allows seals to be of various shapes. The seal blades are always kept at high temperature to heat and fuse the object to be sealed. This means that the heat blade is always maintained hot enough to melt the film.

The constant heat sealer requires no seal-cooling period. Sealing can thus be conducted extremely fast as long as you are not looking for a clean sealing finish.

Impulse sealer, on the other hand, fuses the film by conducting electricity on impulse through a heater ribbon, which dictates that as a rule, the shape of the seal be a straight line. The impulse sealer requires a film-cooling period. This is why users observe that the impulse sealer takes more time than a constant heat sealer.

Methods sometimes used to overcome this shortcoming are forced cooling methods such as air-cooling and water-cooling.

At Fuji Impulse, we are working to meet or beat the efficiency of the constant heat sealer by equipping our impulse sealers with the Onpul function (please see Page 5). In addition, we will be marketing what we tentatively call “cup sealers,” which seal without reaching hot temperature (up to about 150°C) and allow round- and square-shaped seals.

Comparing impulse sealer and constant heat sealer

	Impulse sealer	Constant heat sealer
Heat-generating part (seal blade)	Heat generates only during the heating process.	Heat generates constantly.
Wait before standby	None	Yes
Seal finish precision	Clean finish in the shape of the pressure-knife surface.	Not necessarily clean finish without a cooling process.
Seal cooling-period	Required	Not required
Seal-temperature control	Possible with temperature-sensor attachment. With Onpul, cooling temperature can also be controlled. Extremely low as there is no part that constantly generates heat.	Possible with temperature-sensor attachment.
Risk of burns	Extremely low as there is no part that constantly generates heat.	Relatively high as there is a part that constantly generates high heat.
Economy (energy consumption)	Energy consumption is relatively low with no need to preheat; energy is used only during the heating process.	Energy consumption is relatively high as the seal blade is maintained at high temperature to allow sealing.

1. Impulse Sealer

An impulse sealer heat-seals objects by sending high current on impulse to a heater ribbon, equipped on the surface of the heat-sealing blade, to generate heat that enables thermal-sealing through thermal conductivity. The section to be sealed is placed between the heat-sealing blades, pressed, and thermal-fused when current and heat are delivered on impulse* through the heater ribbon. After the current stops, a cooling process is necessary during which the pressure is maintained.

*The name “impulse sealer” is derived from the fact that the current and heat are delivered on impulse, or instantaneously.

2. Constant Heat Sealer

A constant heat sealer has a built-in heater inside the seal blade to generate heat. Heat-sealing occurs by generating heat and controlling temperature at the seal blade. Constant heat sealers can seal many shapes, a good example being the cup seal. Its strong point is the fast sealing speed, owing to the fact that it does not require a cooling process. Its weak point, on the other hand, is that unless you use an automated machine, you need to be an accomplished operator to operate the hand- or foot-operated machine as pressure application and foot-application time dictates the seal integrity. Another weakness is that there is a wait between turning on the switch and using the machine as it takes time for the sealing part to generate heat.

The Fuji Impulse sealer that falls under this category is EX-15.

Band sealer: leader among constant heat sealers?

A band sealer seals by rotating a band that is heated at a fixed temperature, and placing a bag opening under the band for automatic feeding as the belt moves. The smaller the bag opening to be placed under the band, the faster the sealing speed. (A firm material under 10cm in diameter seals at significant speed.) Like constant heat sealer, however, a band sealer requires a warm-up period after the switch is turned on.

3. Ultrasonic Sealer

An ultrasonic sealer converts ultrasonic energy of 20Khz frequency or higher into a mechanical frequency energy, conveys ultrasonic frequency waves from a resonator horn to the section to be fused, generates strong friction heat and seals the object.

Like high-frequency sealer, sealing occurs by heat generated within the material to be sealed. Unlike the high-frequency sealer, however, ultrasonic sealer can thermal-heat almost anything such as film and nonwoven materials as long as they are thermoplastic.

The Fuji Impulse sealers that fall under this category include US-60B.

4. High-Frequency Sealer

A high-frequency sealer applies high-frequency voltage to the electrodes as the packaging material is being pressed. The high-frequency dielectric heating generates heat from within the packaging material, causing it to seal.

Given a constant frequency and electrolytic potential for the high-frequency power, the heat value gets higher as the dielectric loss factor increases.

Because thermal-sealing is possible only at a certain heat value and higher, high-frequency sealer can only be used with resins that have high dielectric loss factors, such as vinyl chloride, vinylidene chloride and nylon.