

ULTRASONIC WELDERS



**ULTRASONIC WELDERS
USPM SERIES**

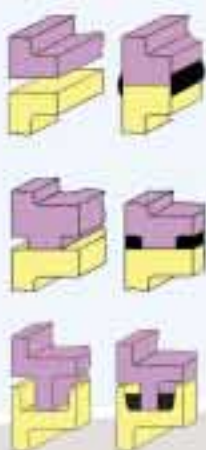
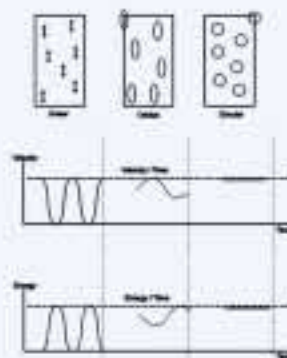
The ultrasonic welding is carried out applying to the parts to be welded a normal variable load and putting in vibration one part with respect to the other, by means of the vibrating group consisting of a transducer and a booster with a sonotrode which produces friction between the parts by means of a vibration with ultrasonic frequency. This intensive vibration produces heat and, as a consequence, the thermoplastic materials are melting assuring the welding. The transducer converts the electrical impulses into mechanical movement. The booster amplifies this movement and transfers it to the sonotrode which is brought into contact with the part to be welded. The sonotrodes can be manufactured in various materials and follow the part's shape. The designing is being carried out with FEM analysis. Special attention is paid to the shape of the welding joints. They have the task to concentrate the energy to consent a very fast ultrasonic welding cycle. Their shape and dimension is sized according to the application and the material to weld. All our ultrasonic welders are provided with cycle control by microprocessor. It is possible to carry out welding cycles with the control of time, energy and height. Our ultrasonic generators have electronic controls with automatic frequency research (autotuning) and amplitude variation. The production of standard welders proposes a widespread range, with several models that may be adapted to different assembling problems. The manufacturing of special welding machines is always handled involving the customer. In that way, the sale determines a very appreciated and positive result. Ultrasonic welding is very advantageous as it is fast, reliable and substitutes in a favorable way those assembling systems as gluing and screws. Ultrasonic welders are used in various fields as the production of car parts, in the medical field, for the production of technical articles and the electrotechnics industry.



VIBRATION WELDERS



**VIBRATION WELDERS
VSP 405 SERIES**



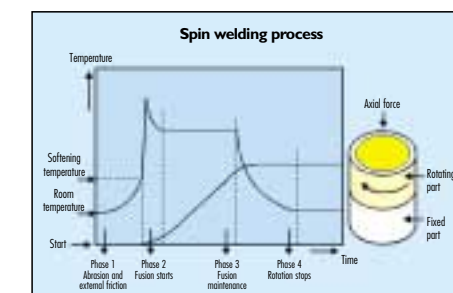
It is possible to weld with time or height mode. In this case the welding quote is controlled by encoder with centesimal resolution. For every cycle phase, head down, welding and compression, it is possible to set different thrust pressures. The microprocessor allows to store ten welding programs. This technology is part of our production of machines for plastic materials assembly. The production of vibration welders is handled completely inside the Sirius Electric plant in Vigevano (PV), Italy.



SPIN WELDERS



**SPIN WELDING
SWP 06 SERIES**



In this graph you can see the spin welding cycle. The cycle is subdivided into four different phases:

- phase 1 - the cycle is started up and the material is subjected to friction;
- phase 2 - the rotation continues and the fusion starts;
- phase 3 - the rotation continues and all the section involved in welding is solidifying;
- phase 4 - the motor is stopped instantaneously and the melted material solidifies in order to obtain a perfect welding.

The welding of thermoplastic materials using spin welding technique is performed by fusion of the contact surfaces. The local temperature increase necessary for the fusion process is obtained by friction of one of the two parts to be welded. On the part subject to rotating motion is applied a thrust pressure in order to maintain in contact the parts during the process. In these spin welders the rotating motion is achieved with an appropriately controlled motor and with a spindle which is being realized following the shape of the part to be welded. With this technology you can weld parts made of thermoplastic materials, exclusively of circular shapes. The parts to be welded are held inside appropriately shaped fixtures. When the fusion temperature of the materials has been reached, the circular motion has to stop within 0,5 seconds. Our spin welders are endowed with microprocessor to control and handle the welding cycle. There are ten welding programs to set time, distance, torque and angular position. The programming is easy and direct, and the various menus are available following simple instructions. The production of standard welding machines made it possible for us to reach an elevated welding quality and reliability. It is possible to manufacture special welding machines, following customers problems and specific needs. Our spin welders come complete with proportional valve to control the thrust pressure. In this technology, the welding joint has to be designed according to the technical specifications requested by the customer.



HOT PLATE WELDERS



HOT PLATE WELDER BASIC

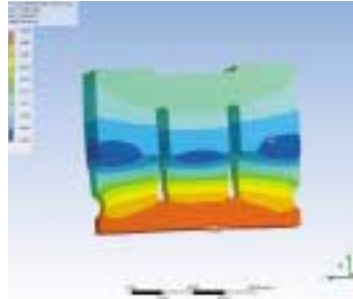
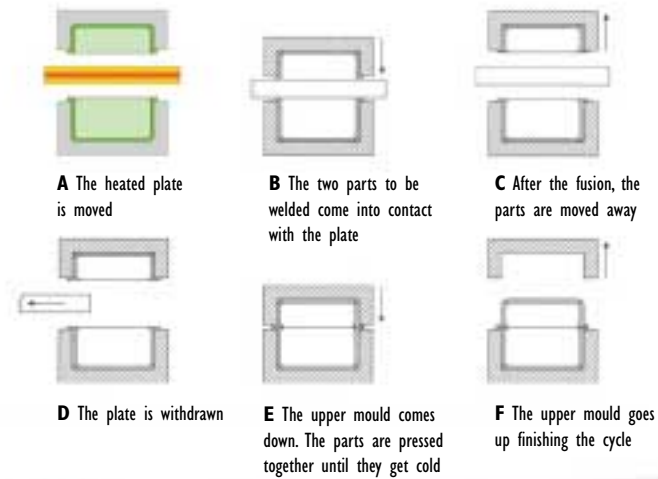


HOT PLATE WELDER LINEAR



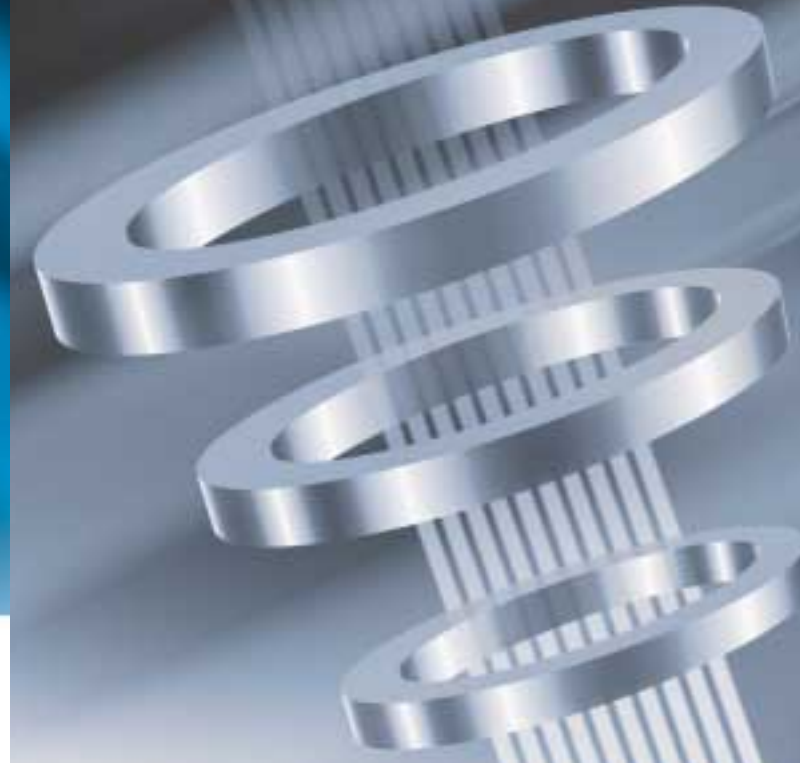
The principle of hot plate welding is easy and direct. Thermoplastic materials, according to the definition, are sensitive to heat. With this technology, the fusion of the material is achieved by direct contact with a heated and electronically thermo-regulated plate. The pressure exercised during the welding of the thermoplastic materials is one of the essential parameters, such as the correct temperature setting, which is between 250 and 350 °C. The two parts to be assembled are contained inside respective fixtures and the hot plate welding cycle is performed automatically, and is handled with the setting of the heating time and the cooling time. The mechanical movements of the machine have to be quick, in the way that the heating and the fusion of the welding joint are sufficiently plastic for the interpenetration of the two parts to be welded. The toolings are equipped with mechanical locks which determine the fusion height and the solidification quote of the parts to be assembled. With our hot plate welders, you can even weld parts having big dimensions which have as well to be watertight. The sale of hot plate welders finds a lot of space within the assembling of parts made of semi-crystalline thermoplastic materials as polypropylene, with particular reference to household appliance and automotive field.

Hot Plate welding cycle



SIRIUSELECTRIC PLASTIC WELDING SYSTEMS

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