

Imagine the possibilities...



Industry: Medical
Description: • Surgical Reservoir



Industry: Automotive
Description: • Fuel Pump Assembly



Industry: Automotive
Description: • Air Intake Manifold
• Tail Light Assembly
• Instrument Panel



Industry: Automotive
Description: • Exterior Trim
• Grab Handles



AUTOMOTIVE
AEROSPACE
APPLIANCE
MEDICAL
ELECTRICAL/ELECTRONIC
RECREATIONAL

The applications are endless...

Forward Technology offers a complete line of assembly equipment:

- | | | |
|-------------------|--------------------|---------------|
| HOT PLATE WELDERS | ULTRASONIC WELDERS | SPIN WELDERS |
| VIBRATION WELDERS | LEAK TESTERS | THERMOSTAKERS |
| SPECIAL SYSTEMS | | |



HOT PLATE, VIBRATION, SPIN WELDING AND LEAK TESTING DIVISION
260 Jenks Avenue ■ Cokato, MN 55321 ■ Phone: 320.286.2578 ■ Fax: 320.286.2467
E-mail: info@forwardtech.com ■ www.forwardtech.com
©2002, Forward Technology. We reserve the right to make technical changes. VW/0902

VIBRATION WELDERS

Experience. Expertise. Equipment.

Forward Technology provides a complete line of plastic bonding and leak testing equipment for a wide range of industries. For over 30 years, our design and manufacturing expertise has allowed us to effectively provide an innovative solution that is best for your application.



Our vibration welders are capable of welding large, small, multi-cavity or irregular shaped applications (Model LVW 2046 shown).



FEATURES:

- Ten adjustable pressure-time steps per weld cycle
- Advanced amplitude control system
- Patented high output digital drive
- Process verification
- Fully enclosed sound guards
- Part counters
- Variable parameters
- Ergonomic design
- Three welding modes
- Flow-through capability for easy automation

SPECIAL CAPABILITIES:

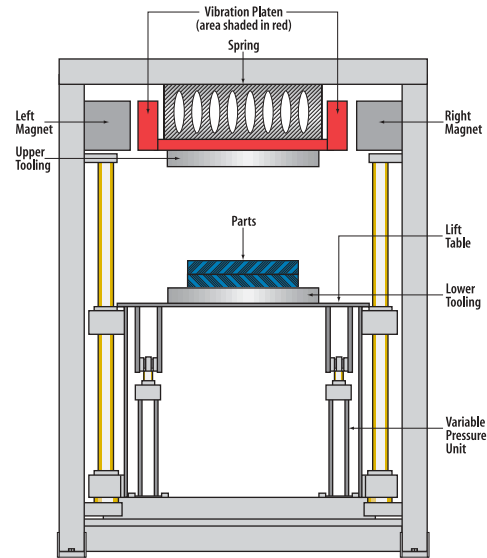
- Complete R&D facility
- In-house tooling expertise
- Application review
- Joint design analysis
- Prototype sampling
- Inspection
- Custom solutions

Several Solutions. One Company.

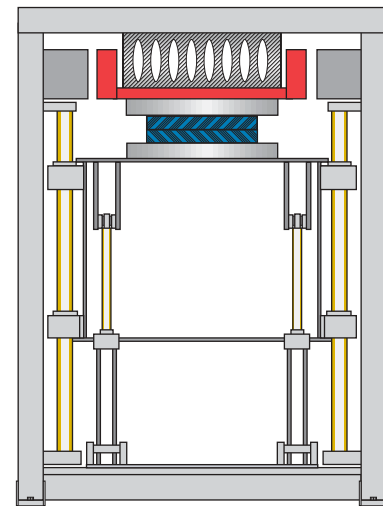


VIBRATION WELDING PROCESS:

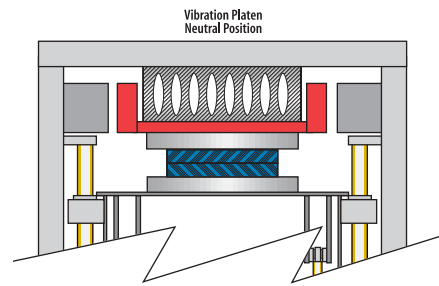
Vibration welding generates frictional heat through linear motion. Friction is achieved through relative motion between two parts, one fixed, the other reciprocating at a controlled amplitude and frequency. Melt occurs at the interface of two plastic parts.



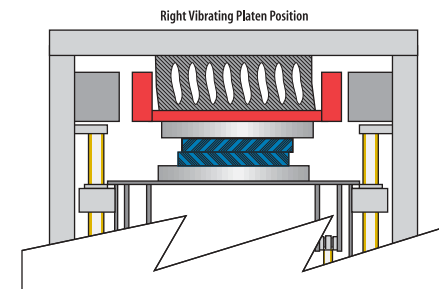
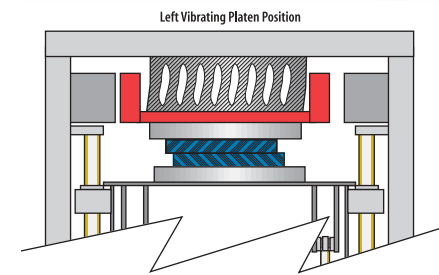
STEP 1
Operator loads parts.



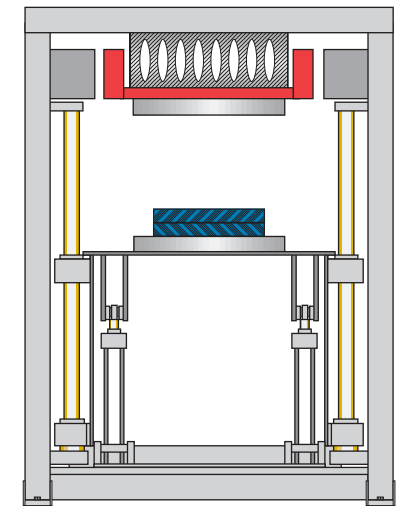
STEP 2
Table raises to weld position.



STEP 3
Electromagnets are alternately energized. This pulls the vibrating platen and the upper tooling fixture alternately left and right, generating a peak to peak displacement up to 0.070 inches.



STEP 4
Cooling/hold cycle.



STEP 5
Table descends and welded parts are unloaded.

ADJUSTABLE WELDING STEPS:

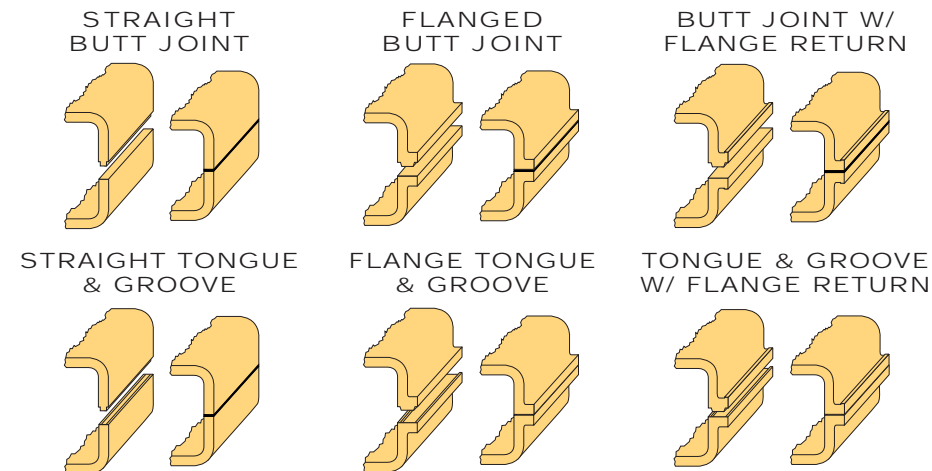
- Each step programmed for a fixed pressure, amplitude and time duration or melt depth
- Greater control and flexibility
- Faster weld cycles
- Maximum weld strength
- Adjustable programming

COMMONLY USED MATERIALS:

- ABS
- Acrylic
- Acetal
- Cellulosics (CA, CAB, CAP)
- Polyamide (PA)
- Polycarbonate (PC)
- Polyethylene (PE)
- Polymethylpentene (TPX)
- Polyphenylene Oxide (PPO)
- Polypropylene (PP)
- Polystyrene, GP
- Polysulfone

JOINT DESIGNS:

Joint design varies with each application and depends on factors such as type of plastic to be welded, part geometry and requirements of the weld. We recommend discussing joint designs with one of our application engineers before arriving at your final part design.



Instrument Panel Tooling



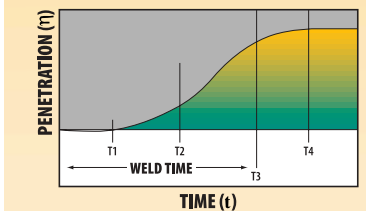
TOOLING:

- Specially designed in-house for your specific application
- Designed for ease of maintenance, adjustment and maximum life
- Provides accurate mating and alignment

Filter Tooling/Application

KEY WELDING PARAMETERS:

- Frequency
- Time
- Melt-travel distance
- Amplitude
- Pressure



ADVANTAGES OF VIBRATION WELDING:

- Fast cycle times
- Low tooling costs
- Easily automated
- Energy efficient
- High joint strength
- Compatible with many thermoplastics
- Quick change tooling
- Suitable for dissimilar materials
- High strength, pressure tight hermetic seal
- No fumes or emissions