

PK Welding Guide

Mechanical assembly techniques such as threading and machining are used for PK, and ultrasonic-welding, hot-plate welding, vibration and spin welding techniques are generally used for unfilled PK. If welding technology is available, it is recommended to select Ultrasonic-welding, Hot-plate welding, Vibration, Spin Welding.

I . Ultrasonic-welding

- PK is a feature that dissipates energy, so near-field welding is recommended. Far-field operation is also possible, but the strength of the joint may be lowered.
- For optimal concentration of energy, it is suitable to use a Projection Point for the Shear Joint.
- Typical ultrasonic welding conditions are as follows.
 - ✓ Booster horn ratio: 1 : 2
 - ✓ Clampforce: 0.1 – 1.15 MPa
 - ✓ Welding time: 0.8 – 1 sec



Ultrasonic-Splicer

II. Hot-plate welding

- General hot-plate welding technology is suitable for polyketone.
- It is desirable to perform the line's Welding operation and Injection Molding together.
- In the case of offline welding, the moisture content should be less than 0.1% by drying to prevent the moisture in the polymer from reducing the weld strength.
- If the hot plate is contaminated, it adversely affects the weld strength, so it must be cleaned quickly before the welding process.
- Accurate temperature control of the hot plate is important.
- Typical hot-plate welding conditions are as follows.
 - ✓ Heating time: 100 – 150s
 - ✓ Plate Temperature: 240 – 260°C
 - ✓ Plate Part Pressure: 0.03MPa



Heat fusion machine

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III. Vibration, Spin Welding.

- PK can also use vibration or spin welding, but the results are not as good as ultrasonic welding or hot-plate welding.
- Typical Vibration Welding conditions are as follows.
 - ✓ Vibration Frequency : 200Hz
 - ✓ Weld time : 4 – 8s
 - ✓ Pressure : 2- 3.5 MPa
 - ✓ Vibration Amplitude : 1.7mm



Vibration welding machine



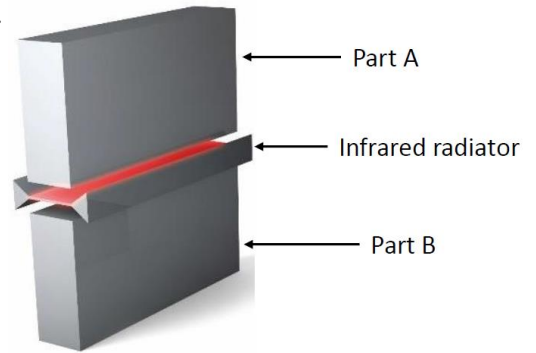
Rotary splicer

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IV. IR Welding(Infrared-Welding).

- Best welding results got realized with Infrared-Welding on PK parts
- Typical Infrared Welding conditions are as follows.

- ✓ Cooling-time: 40 seconds
- ✓ Warm-up distance: 18.5 mm
- ✓ Warm-up time: 20-30 seconds
- ✓ Power: 700W – short wave
- ✓ Joining pressure: 2-5 N/mm²



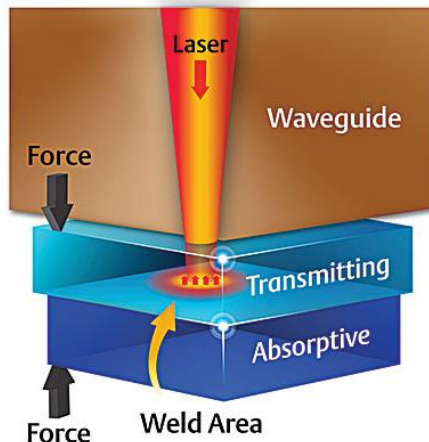
schematic sketch

V. Laser Welding.

- Best welding results got realized with Laser Welding on PK parts
- Typical Laser Welding conditions are as follows.

- ✓ Laser power: 150W
- ✓ Robot speed: 15,20mm/s
- ✓ Pressure: 7.5bar

Laser Welding Process



Absorptive part converts laser to heat, heat conducts across interface to melt both parts