How Assembly Methods Compare for Hard-to-Bond Plastics

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| **Mechanical Fasteners** | **Solvent****Welding** | **Ultrasonic****Welding** | Vibration**Welding** | **Heated Tool****Welding** | **Adhesive****Assembly** |
| **Benefits:*** Ease of use
* Full strength immediately
* Removable

**Limitations:**+Stress concentrator+No seal+Large # of parts+Difficult to automate+Poor aesthetics, +Requires process to create hole, +Hole is a leak path | **Benefits:*** Low cost
* Simple
* Fast

**Limitations:*** Not usable on thermosets
* Can cause stress cracking
* Health & safety issues
* Poor gap filling
 | **Benefits:*** Easily automated
* Simple
* Fast

L**imitations:*** Not usable on thermosets
* Plastics must be compatible
* Poor gap filling
* Capital cost
* Must remove or hide weld flash
 | **Benefits:*** Simple
* Fast
* Surface prep not required

**Limitations:*** Not usable on thermosets
* Plastics must be rigid/flat
* Capital cost
* Must remove or hide weld flash
 | **Benefits:*** Easily automated
* Simple
* Fast

**Limitations:*** Not usable on thermosets
* Surfaces must be clean/flat
* Capital cost
* Must remove or hide weld flash
 | **Benefits:*** Join dissimilar materials
* Even stress distribution
* Fill large gaps
* Seal and bond
* Easily automated
* Aesthetically acceptable

**Limitations:*** Requires cure
* Requires fixture time
* Can be messy
* Chemical in plant
 |

Source: Henkel