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