

UV Curable Resin Adhesive	Pressure Sensitive Adhesive (PSA)
<p>A compatible resin is used to bond the two substrates to one another.</p>	<p>PSA films are a popular choice because there are numerous varieties to choose from and they offer many advantages</p>
<p>Advantages</p> <ul style="list-style-type: none"> • Fast, scalable, automatable adhesive technique • Controlled thickness • Very strong adhesion 	<p>Advantages</p> <ul style="list-style-type: none"> • Strong adhesion • Consistent thickness of PSA • Flexible • Low autofluorescence • No outgassing • Hydrophilic/hydrophobic coating compatible
<p>Disadvantages</p> <ul style="list-style-type: none"> • Prone to channel blockage • Mixed materials • Limited flexibility of channel depth • Shelf life • Bubbles 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Requires material converting and precision alignment • Non-homogeneous channel properties • Channel depth dependent • Shelf life
Laser Welding	Thermal Fusion Bonding
<p>Polymer layers are melted together using a laser, forming a strong bond free from additives.</p>	<p>Application of heat and pressure at near glass transition temperature to fuse surfaces together, typically the same material.</p>
<p>Advantages</p> <ul style="list-style-type: none"> • No additives • Precise contour welding path • Short cycle times • Alignment is precise • Scalable • Possible for dissimilar materials 	<p>Advantages</p> <ul style="list-style-type: none"> • Pure surface bonding; no additives • Maintains optical clarity • High bond strength • Hermetic seal • Relatively simple process
<p>Disadvantages</p> <ul style="list-style-type: none"> • Weld expansion due to heat • Complex fixtures and clamps • Warping can be problem 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Slower cycle times • Limited scalability • Deformation can be an issue • Process compatibility
Ultrasonic Welding	Chemical Solvent Bonding
<p>Ultrasonic vibrations create a pure bond between substrates using energy directors.</p>	<p>Application of a chemical solvent to bond two surfaces together.</p>
<p>Advantages</p> <ul style="list-style-type: none"> • Short cycle times • Batch processing • Macro scale cartridge assembly • Established and inexpensive technology • Suitable for perimeter welding applications 	<p>Advantages</p> <ul style="list-style-type: none"> • Clean full surface bonding • High bond strength • Low process complexity • Adaptable to different designs
<p>Disadvantages</p> <ul style="list-style-type: none"> • Requires an energy director • Not as accurate as other techniques • Custom fixtures needed • Rough bonding • Uneven energy distribution makes controlling melt flow difficult 	<p>Disadvantages</p> <ul style="list-style-type: none"> • Slow cycle times • Can be difficult to control • Potential chemical sensitivities • Environmental (solvents) and safety issues