Adhesive Applications: Mastering Part Joining

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About Taylor Santa

Taylor received her degree in Chemical Forensic Science at Western Carolina University and has worked in the methacrylate adhesive world for 8 years. In that time, she has worked in quality control, performance application testing, research and development, and finally technical service support.

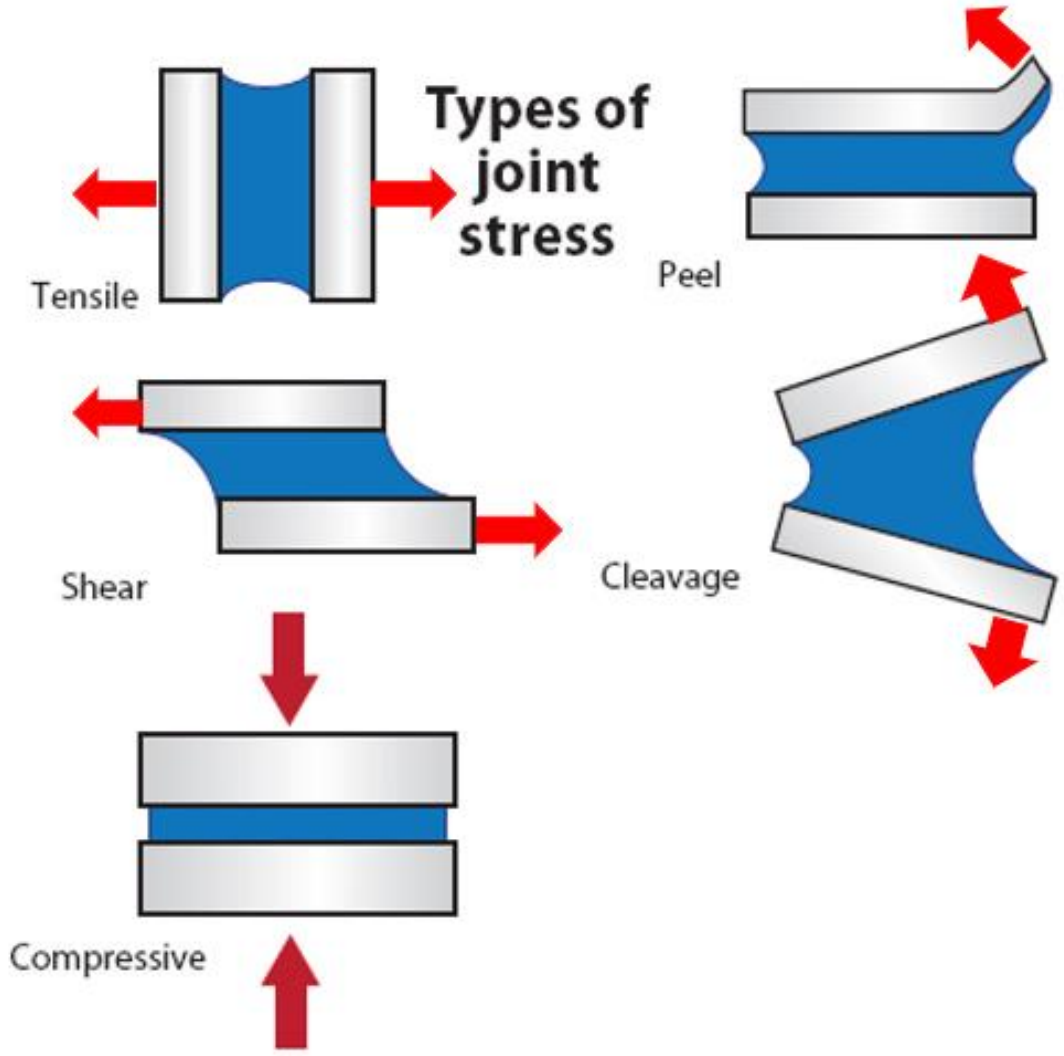
About IPS Adhesives

IPS Adhesives is a leading provider of adhesives, servicing the surfacing, structural, and assembly industries. With a combined 65 years of expertise and locations in both North America and Europe, its products are recognized by OEMs and fabricators globally for their premium quality, strength, and reliability.

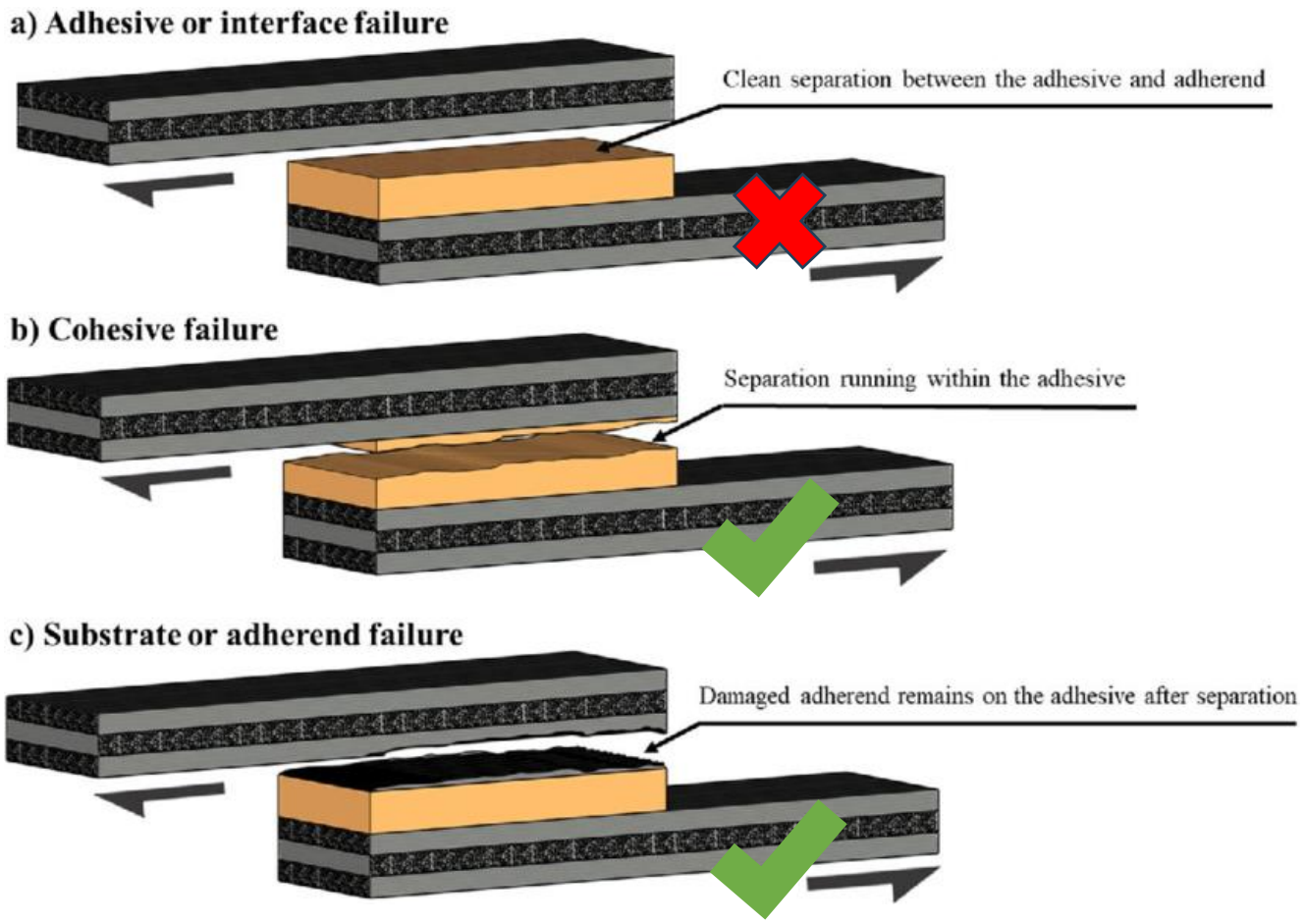
Types of Joints

- Lap Shear
  - Most commonly seen
- Butt
- Tee
- Tongue and Groove

Types of Stress

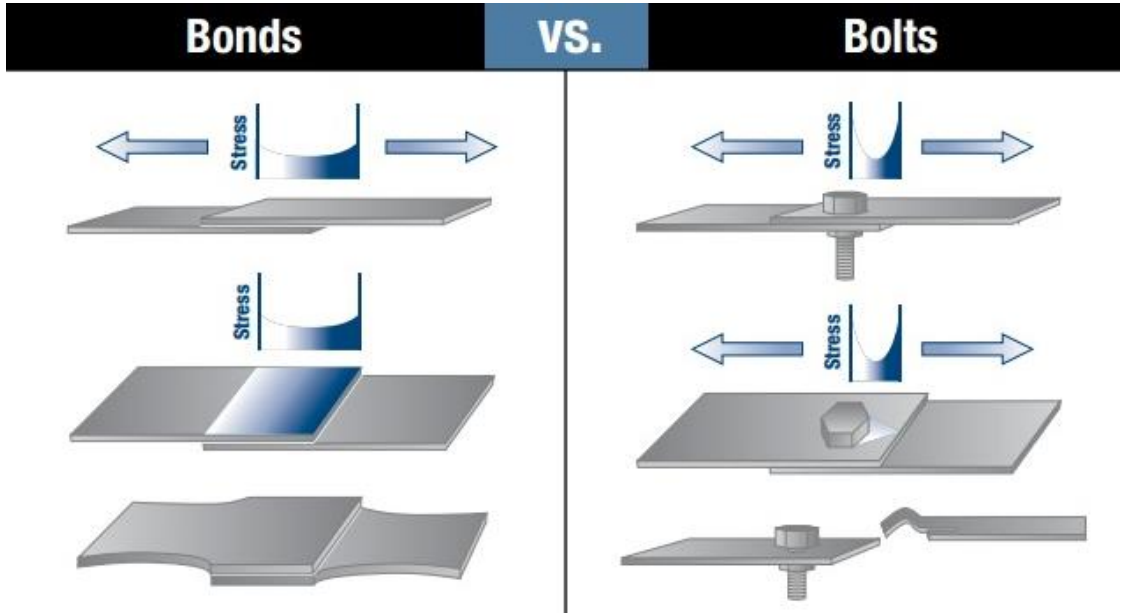


Failure Mode



Challenges of Welding, Riveting, and Mechanical Fastening

- Damaging substrates
- Smaller spaces
- Specialized personnel to weld
- Not flexible or fatigue resistant
- Heavy



Adhesives in Part Joining

Benefits

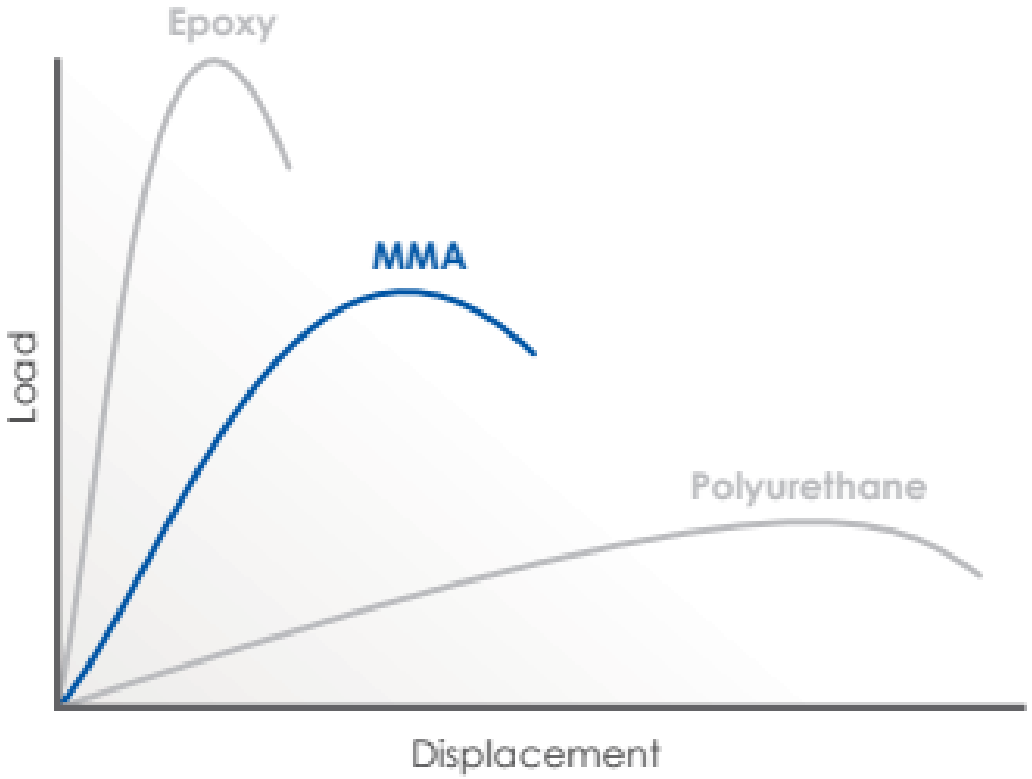
- Easy to use
  - Labor savings
- Lightweight
- Join Dissimilar Substrates
- Quick set up, prep, and curing times
- More aesthetically appealing
- Minimal finishing work (no scrap, chips, uneven welds…)
- Reduced risk of hand injuries

Limitations

- Smell of MMAs
- Can be messy
- Need special dispensers

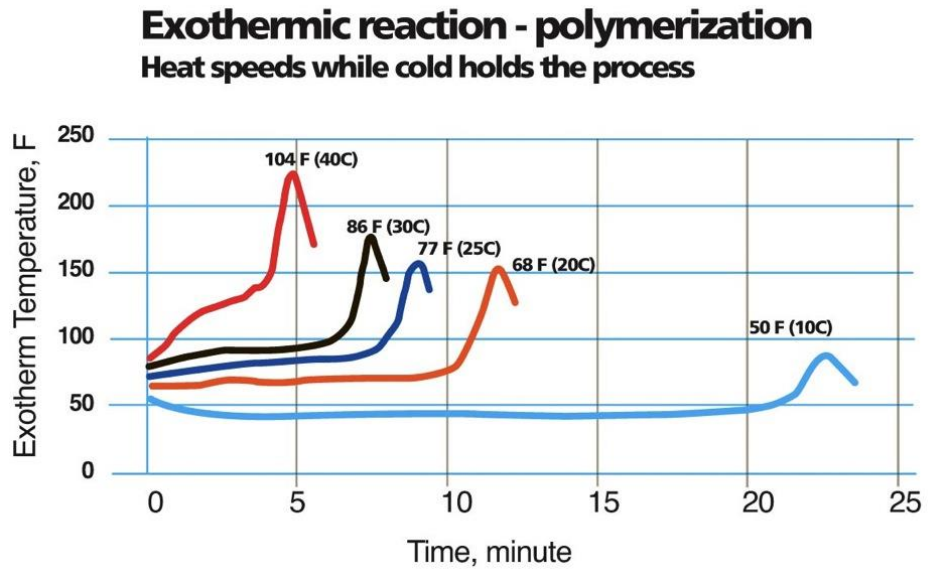
Types of Adhesive

	Epoxy	MMA	PU (2K)
+	• Very high Strength (>30 MPa) • Weathering resistance	• Adhesion on Plastic, metal, and composite • Min. surface prep. • Easy to use • Fast curing time • Fatigue and impact resistant	• Flexibility • No odour • Adhesion to plastic/wood • Impact resistance
-	• Surface Prep.required • Can be brittle • Longer curing time	• Exothermic reaction (shrinkage) • Odor	• Low strength • Surface prep. • H&S (iso) • Longer curing time



What Specifications Do You Have?

- Time Restraints
  - Working time
  - Cure Time (mostly for subassemblies)
- Application type
  - Bulk Machine
  - Cartridge
- Strength and flexibility
  - Lap Shear
  - Elongation
- Color
- Sand and paint ability
- Environmental Resistance
  - UV
  - Salt and Chemical Exposure
  - Service Temperatures



Curing speed and open time are influenced by Temperature !

How to Test Adhesives on YOUR Parts

Adhesive application:

- Purging is an essential part of successful bonding
- Apply enough material for a small amount of squeeze-out
- Open time must be respected
- Wait until the fixture time is reached to move the parts
- Complete curing and full properties are achieved after few hours

Testing Bonded Parts

1. Wait for adhesive is cured and fixture time has passed
2. Apply force in the same direction that the end use part will see
3. Identify failure mode

*If you would like to see numerical force data on your substrates, please reach out to our technical team. Scigrip Adhesives has a full applications lab and is more than happy to help get your parts tested.

SCIGRIP® SG100 Series

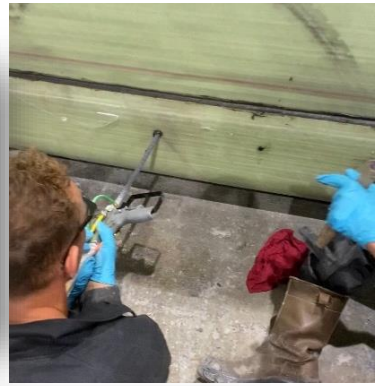
High-Strength Adhesive with UV Resistance

- Two component - 10:1 mix ratio methyl methacrylate adhesive
- Bright White, UV resistant – Designed for Exterior Applications
- Choice of 15 or 40 minute working times
- No sagging, even when vertical
- Excellent fatigue, impact and shock load resistance
- Packaging Options
    - 490 ml cartridges, 5 & 50-gallon bulk containers

SCIGRIP® SG300 Series

Workhorse of Industrial Bonding - Primerless Metal Bonding for Manufacturing

- Two component - 10:1 mix ratio methyl methacrylate adhesive
- Multiple Working Times: 5, 15, 40
- Two different colors – Black & Off-White
- Cross-bonds a wide variety of substrates - Ideal for bonding dissimilar materials
- Designed to meet specific requirements of the transportation industry, including reduced read through on show surfaces.
- No sagging, even when vertical
- Excellent fatigue, impact and shock load resistance
- Packaging Options
    - 50 & 490 ml cartridges, 5 & 50-gallon bulk containers



SCIGRIP® SG5000 Series

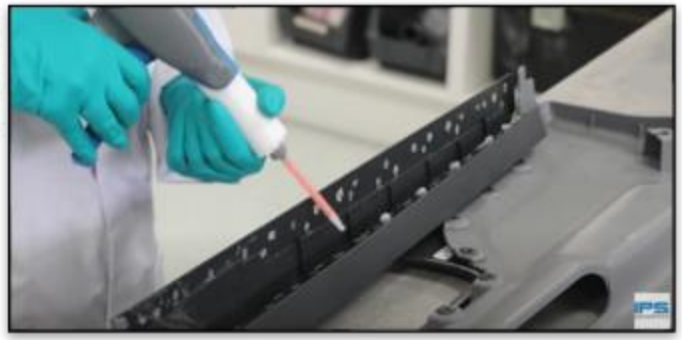
A Strong Metal Bonder That's Also Great at Repairing Fiberglass Molds

- Two component, 1:1 ratio Methacrylate adhesive
- 6- & 13-minutes working times
- Bond bonding metals, plastics and composites
- Flowable viscosity, injectable
- High tensile and shear strengths
- Most metals, including steel and aluminum, can be bonded without surface pretreatment
- Packaging Options
    - 50 & 490 ml cartridges, 5-gal pails & 55-gal drums

SCIGRIP® SG400LSE

High-Strength Adhesive Formulated to Bond LSE Substrates with No Surface Preparation Required

- Two component - 10:1 mix ratio methyl methacrylate adhesive
- Bond low surface energy plastics including polypropylene and polyethylene without surface treatment.
- Simplifies processes and saves on labor costs by eliminating need for flaming, plasma treatment or other methods
- Bonds dissimilar materials, including plastics, FRP, and metals
- Excellent fatigue, impact and shock load resistance
- Packaging Options
    - 50 ml, 490 ml cartridges



Summary

- Welding and mechanical fastening has its challenges.
  - Heavy
  - Specialized personnel
  - Likelihood of loosening and breaking over time
- Adhesives are an easy way to assemble large and small parts
  - Permanent bond
  - Lightweight
  - Easy to use

a brand of IPS ADHESIVES