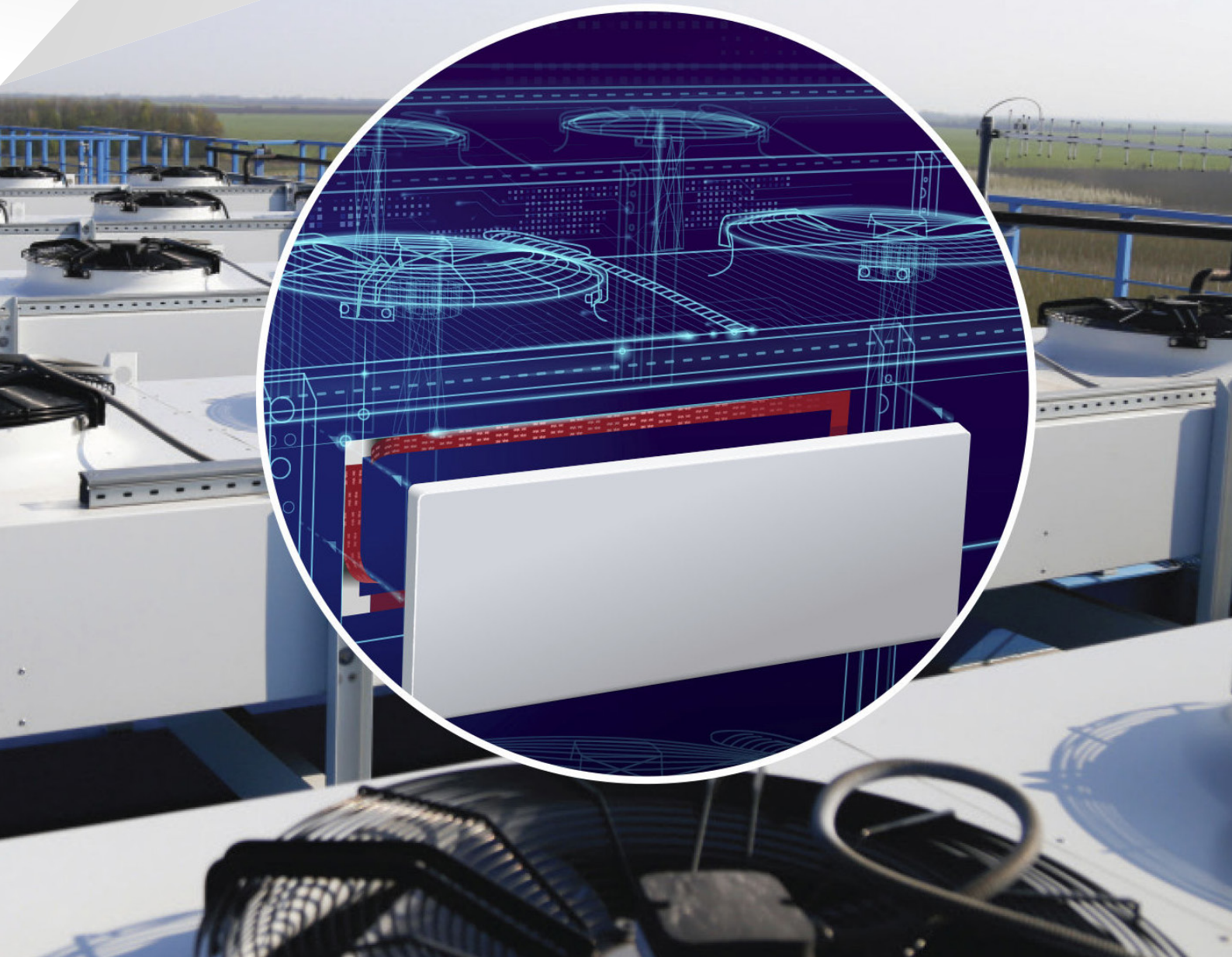
3M Science. Applied to Life.™

Modern Metalworking

Explore 3M Bonding Solutions for Metal Equipment Assembly Challenges



Metal Industries and Key Assembly Challenges


Metal Fabrication


Machine Tool


Elevator & Door


Metal Furniture


Specialty Vehicle


HVAC


Electric Control Unit


EV Charger


Data Center Enclosure & Rack



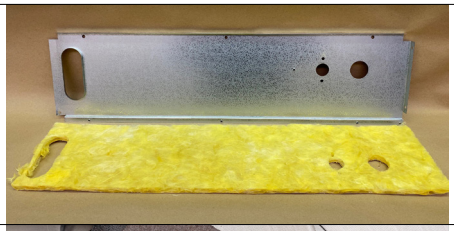
Solar Energy & ESS

Market Trend in Metal Industries

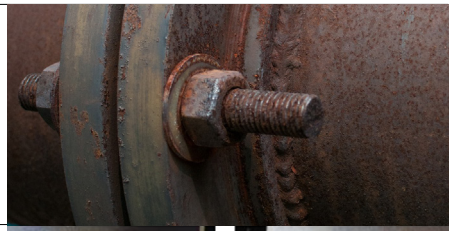
1. Rising demand for high-strength, high-performance structures
2. Escalating labour costs
3. Lightweight, low-noise, high-efficiency design trends
4. Pressure for quality consistency and process simplification
5. Multi-material architectures and tougher environmental resistance
6. Relentless lead-time and delivery pressure

See how 3M bonding solutions are faster, cleaner and scalable alternatives to welding and bolting

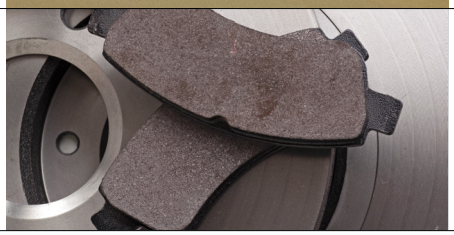
Helps absorb vibration



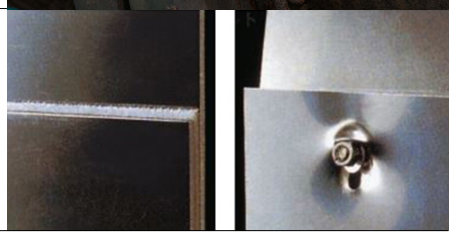
Limit galvanic corrosion



Manage thermal expansion stress



Reduce stress by removing holes



Legacy Metal Assembly vs. 3M Tapes and Adhesives Assembly Solutions

Mechanical Fasteners	Welding	3M Tapes and Adhesives
Requires drilling	Heat distortion	No drilling / No heat
Stress concentrated	Residual stress	Load distributed
Thick materials needed	Warping risk	Lightweight materials enabled
Poor with dissimilar materials	Galvanic corrosion risk	Bonds dissimilar materials
Requires extra sealing	Requires grinding/repaint	Bonds + seals simultaneously
Vibration & loosening	Noise & distortion	Damps vibration (NVH)
Visible hardware	Visible weld marks	Clean, smooth appearance
Skill-dependent	High skill required	Simple, consistent process
Complex assembly	High energy use	Shorter, integrated process

Assembly Types & Typical Requirements



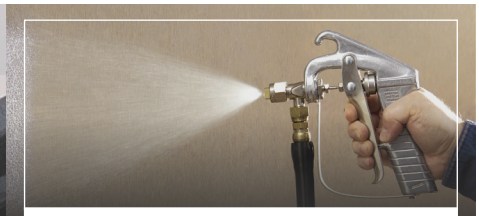
Panel-to-Frame/Stiffener-to-Panel

- Dead load holding strength
- Flexibility for dynamic loads or thermal expansion mismatch
- Gap filling or variation in fit from end to end
- Water-tight sealing



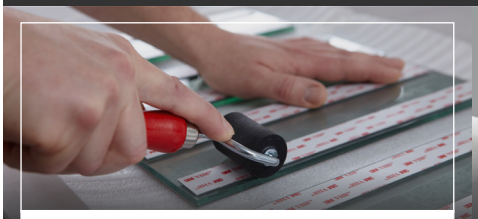
Small Joint Assembly

- Low-viscosity liquids for tight-fitting parts
- Vibration resistance
- Very high strength
- Ability to bond dissimilar materials



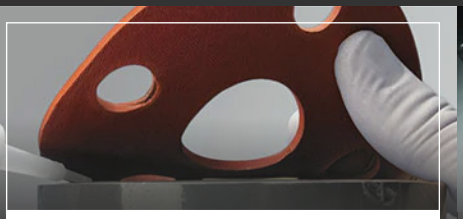
Large Surface Lamination

- Shear and peel strength
- Temperature and solvent resistance
- Favourable aesthetics with low read-through
- Speed and convenience in application



Mounting and Trim Attachment

- Dead load holding strength
- Pleasing aesthetics
- Repositionability during application
- Fast rate of strength build



Gasket Attachment

- Easy and fast application of tape or adhesive
- Strong environmental and chemical resistance
- High adhesion to foams, rubbers and other difficult-to-bond substrates



Sealing/Potting and Encapsulating

- Flexibility
- Ease of application
- Time to paint (or handle part)
- Immediate rework

Virtual Experience for Applications & Business Impacts

3M's industrial adhesives and tapes address these needs with a portfolio designed for structural performance, durability, and manufacturability. If you'd like to explore the business impact and bonding applications, please click the link below. (*On mobile, please view in landscape mode.)

Bonding Application

- Base Platform
- Panels
- Insulation
- Components
- Sealing



Click here to view the virtual experience

Business Impact

Productivity

- Increase throughput
- Reduce process time
- Eliminate post-process steps

Process

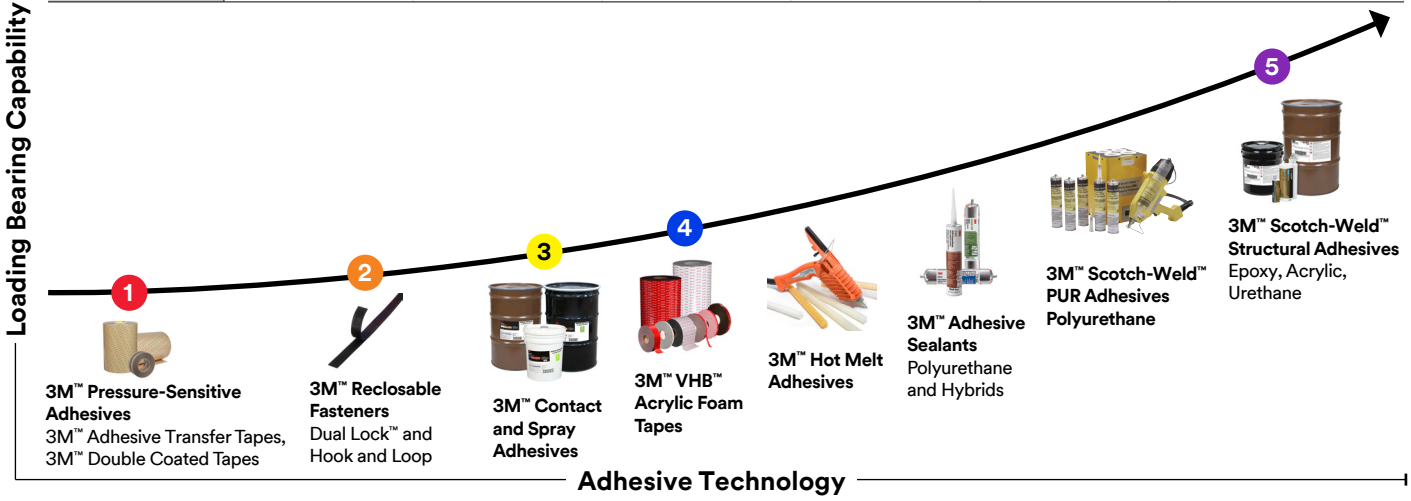
- Save cost
- Increase flexibility
- Greener alternative

Quality

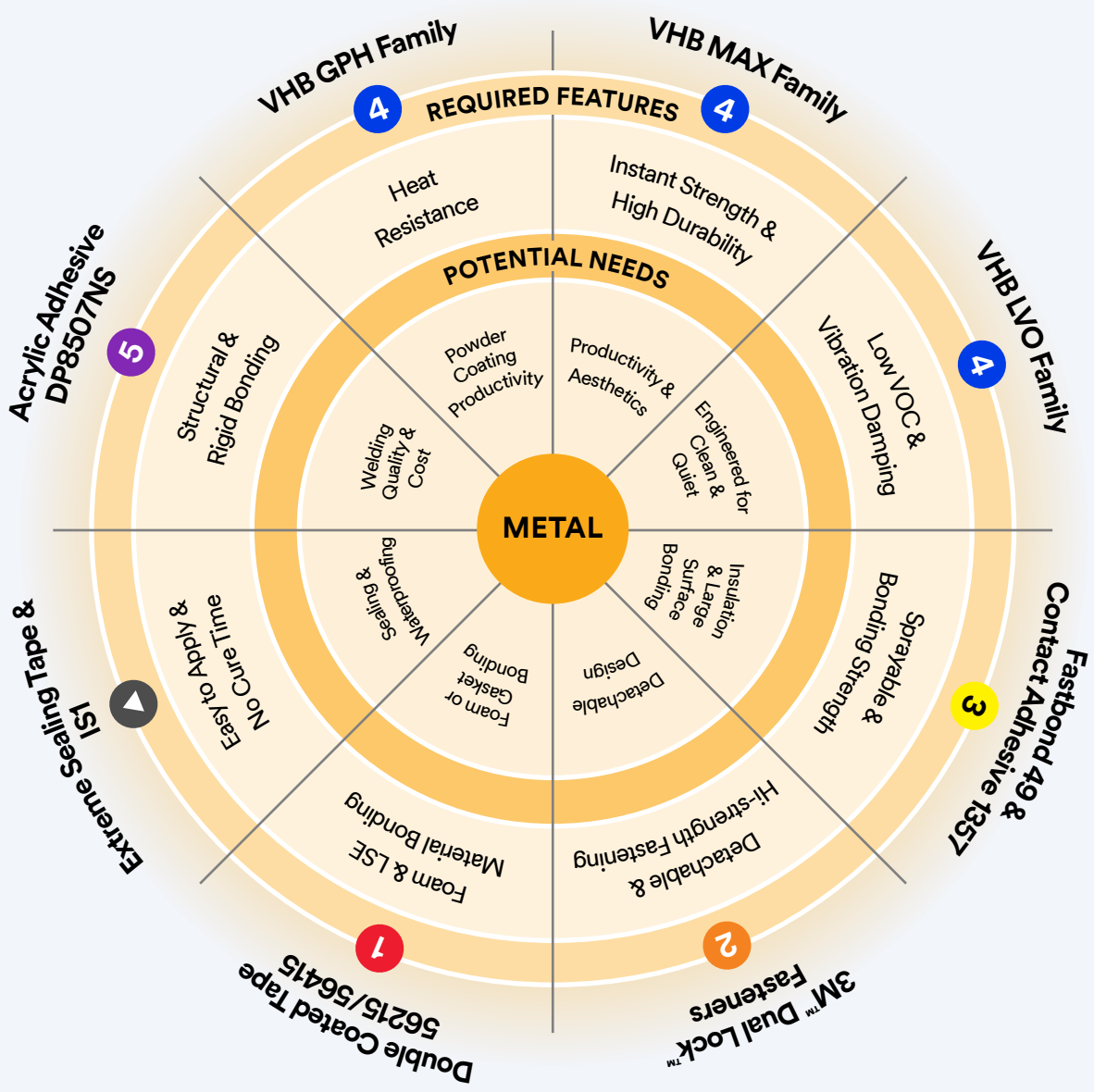
- A better seal
- Excellent performance
- More manufacturing options

3M Adhesives and Tapes Bonding Continuum

Adhesive Load Bearing Capability						
Adhesive Type	PSAs	Hot Melt	Foam Tape	Curing Hot Melt	Polyurethane	Structural Adhesives
Strength (PSI)	1 – 10	10 – 500	200 – 500	400 – 1000	1000 – 3000	2000 – 4000



3M Needs-to-Solution Mapping Wheel for Metal



Top-recommended Solutions

4



3M™ VHB™ Tape Max Family

- **Bonding alternative:** Designed to replace mechanical fasteners, welding requiring extreme strength
- **Superior bond strength:** Provides significantly higher bond strength than standard 3M™ VHB™ Tape
- **Simplified solution:** Immediate handling strength allows for faster assembly and processing times

5



3M™ Scotch-Weld™ Acrylic Adhesive 8507NS

- **A true alternative:** Designed to replace welding & mechanical fasteners without sacrificing bond strength
- **Non-corrosive:** Adheres to both bare and oily metals while remaining non-corrosive
- **High & low temperature:** Withstands up to 200°C for 30 minutes even at temperatures as low as -40°C

▲



3M™ Extreme Sealing Tape 4411W+, White

- Provides an immediate seal without the cure time or mess typically associated with liquid sealants
- Durable, abrasion resistant backing makes this tape a good choice for exterior applications
- Flexible TPO backing easily conforms over screw heads, rivets, joints, splices, and other protrusion

1



3M™ Double Coated Tissue Tape 56215/56415

- **Solvent-free:** Manufactured through a solvent-free adhesive coating process
- **Excellent adhesion:** Built to adhere to a wide variety of foams and fabric substrates
- **Versatile use:** High initial tack for a broad range of industrial applications & cold temperature

Go-to Solutions

4 3M™ VHB™ Tape LVO Family



- Low VOCs
- Low Odor
- Ideal for Interior Applications
- Meets FDA Standards

4 3M™ VHB™ Tape GPH Family



- For Pre-Powder Coating
- High Temperature Resistance
- Immediate Adhesion
- Compensates Surface Roughness

2 3M™ Dual Lock™ Reclosable Fasteners SJ3550CF



- Opened and closed multiple times
- Different strength combinations
- Alternative to screws/bolts

3 3M™ Fastbond™ Insulation Adhesive 49



- Permanent Bond
- High Performance
- Versatile Use
- Certified

3 3M™ Neoprene High Performance Contact Adhesive 1357



- High-performance for laminating
- Adheres sheet metals and plastics
- Moisture and heat resistance

▲ 3M™ Industrial Sealing Tape IS1



- Reliable Water Protection
- Endures Varying Temperatures
- High-Strength Adhesion
- Easy to Use

Ask a 3M Expert

India

Watch our webinar

Metal Enclosure Webinar

To find out more, watch our videos below.

3M™ VHB™ Tape Max Video

3M™ Double Coated Tissue Tapes 56212 Video

3M™ Scotch-Weld™ Acrylic Adhesive DP8507NS/ 8507NS Video

VHB Metal Fabrication Video

Testimonial Video - WS Steel

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