

3M Industrial & Transportation Business

Design Guide for Sign Assembly



Bonding Solutions

for the commercial signage market



Using traditional fabrication techniques such as rivets, screws and spotwelding can necessitate design compromises and cost penalties. However, 3M offers a comprehensive range of alternative bonding solutions that provide aesthetic and durable results tailored to material choice and sign design. This brochure is a guide to help you choose the best bonding techniques for your fabrication.

Application guide for permanent bonding solutions

Post & Panel

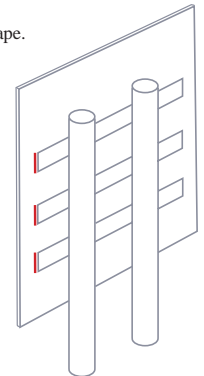
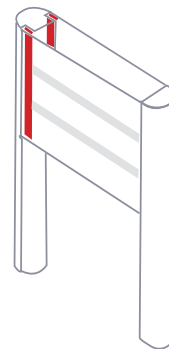
Benefits :

- Smooth sign face, free from distortion and spot weld marks
- Avoids stress points that can be caused by rivets; flexible bond allows joining of dissimilar materials
- Assembly of large signs is made easier with VHB Tape compared to using a rivet gun

Considerations:

- Weather conditions, including extreme temperatures, damp/wet environment require a strong permanent bond
- Flexible bond reduces joint stresses caused by wind movement

Internal stiffeners bonded with 3M™ VHB™ Tape. Use 3M™ Scotch-Weld™ EPX™ Adhesive or 3M VHB Tape for bonding panel to post



Stiffeners bonded with 3M™ VHB™ tape to bare or powder coated metal

Mounted Letters

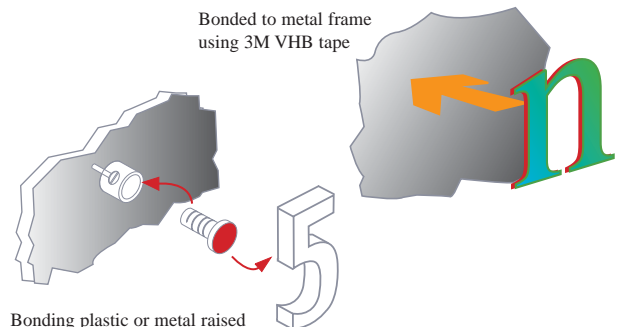
Benefits:

- Ensures flush vandal resistant finish
- Invisible fixing and minimal surface damage
- Structural strength achievable on small areas

Considerations :

- Bonding different substrates (eg. metal to plastic)
- Environment and location of the sign (internal/external)
- If bonding direct to brick, always apply a primer before using 3M VHB Tape. An aerosol adhesive - 3M Spray 80 - can be used as a primer in this case.

Bonded to metal frame using 3M VHB tape



Bonding plastic or metal raised letters with 3M Scotch-Weld EPX Adhesive

Light Box

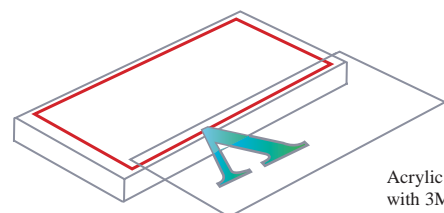
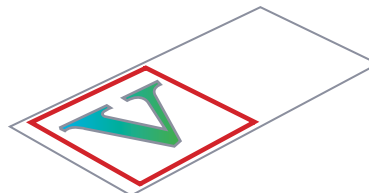
Benefits :

- Tape seals and bonds in one operation
- Allows differential thermal expansion
- Clean attractive finish

Considerations :

- Heat resistance required from light source
- Clarity of bonding products required where transparent materials are used.
- External applications will demand a water tight seal
- Bonding to different materials, eg. aluminium, polycarbonate

Clear 3M VHB Tape provides invisible bond and prevents any visible shadows



Acrylic sheet bonded with 3M VHB tape



Offering you strong and reliable cost efficient assembly techniques

Box Signs

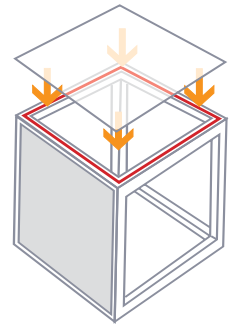
Benefits :

- Flush, clean surfaces
- Improved cost saving as tape enables use of thinner, lighter materials
- Speed and simplicity of assembly (critical for modular sign construction)

Considerations :

- Reduce probability of water ingress
- Minimise galvanic corrosion between dissimilar metals
- Maintain rigidity and durability, particularly for external signs

Aluminium sheet bonded to box frame
Panels bonded to frame.
Depending on performance required, 3M VHB tape or 3M Scotch-Weld EPX adhesive can be used.



Pylons

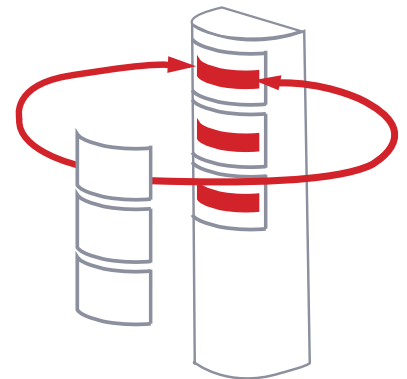
Benefits :

- No deterioration of sign face; improved appearance
- Allows for expansion and contraction of sign panel
- Faster and quieter production
- Bonds and seals in one step

Considerations :

- Choice of bonding options will depend on the differential expansion of the substrates used and on environmental conditions
- If substrates are powder coated, choice of 3M VHB Tape will depend on whether the assembly can take place before or after powder coating

Acrylic sheets bonded to powder coated aluminium with 3M VHB Tape



Forecourts

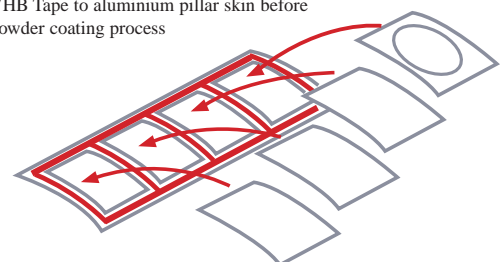
Benefits :

- Bonding prior to powder coating eliminates any issues of adhering to powder coated substrates.
- Fast and easy assembly
- Improved aesthetics; no visible attachment

Considerations :

- Environmental conditions (wind, rain, temperature variations) need to be taken into account. Same considerations apply as for pylons

Aluminium stiffeners bonded with 3M VHB Tape to aluminium pillar skin before powder coating process



Facias

Singleton Ogilvy & Mather

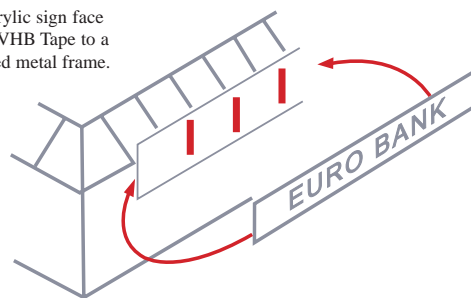
Benefits :

- Easy to apply without any mechanical attachment systems
- Enhanced aesthetics
- Performance of 3M™ VHB™ Tape increases durability of sign

Considerations :

- Durability and choice of materials will determine the best bonding option

Aluminium or acrylic sign face bonded with 3M VHB Tape to a mechanically fixed metal frame.



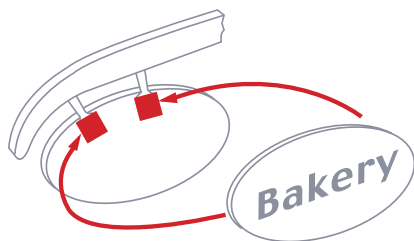
Shop Signs

Benefits :

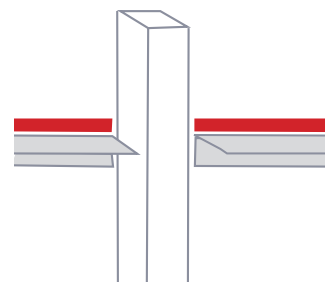
- Invisible fixing method; no mechanical fixing
- High strength and durability
- Easy and fast assembly using the 3M™ Scotch-Weld™ EPX™ Gun

Considerations :

- Design will determine whether to use a structural adhesive or a bonding tape
- As these signs are usually installed outside, sealing against water infiltration is key to ensure durability



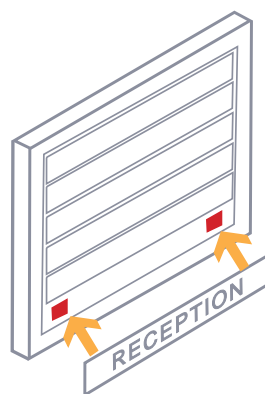
Aluminium arm to suspend the sign is bonded between the two sign faces with 3M Scotch-Weld EPX Adhesive.



Sign face is bonded to metal stiffeners using 3M VHB Tape.

Temporary and removable signs

3M™ Dual Lock™ is made of hundreds of mushroom-shaped stems which interlock when you press two parts together to secure a very strong and yet reclosable assembly. 3M Dual Lock can be opened and closed up to 1,000 times and is 12 times stronger than traditional hook and loop systems. 3M Dual Lock is a self-adhesive system backed by 3M VHB Tape.



3M™ Dual Lock™ provides invisible fixing of temporary or interchangeable signs and nameplates



3M™ VHB™ Acrylic Foam Tapes



3M VHB Acrylic Foam Tapes are high performing and economical alternatives to traditional mechanical fastening systems. Little or no investment in machinery is required. Signs are of better quality, stronger, better looking and of higher resistance to corrosion and environment.

3M VHB Tapes selected for sign making are :

| Product Number | Thickness | Colour | Characteristics |
|---|-----------|--------|--|
| VHB LEADER : | | | |
| 4941 | 1.1mm | Grey | VHB Leader tapes offer ultimate conformability, a unique advantage for a bonding tape. They provide optimal immediate surface contact. |
| 4991 | 2.3mm | Grey | |
| *Special versions. Can be applied at temperatures as low as 0°C | | | |
| AFT : | | | |
| 4611 | 1.1mm | Grey | AFT tapes are ideal for simple assemblies of metal to metal substrates. They offer the best choice between performance and cost effectiveness. |
| VHB CLEAR : | | | |
| 4905 | 0.5mm | Clear | VHB Clear Tapes have been 'the' reference for over 15 years when it comes to bonding translucent or clear materials. They offer high class performance and aesthetics to the signing industry. |
| 4910 | 1.0mm | Clear | |

3M™ Scotch-Weld™ EPX

The 3M Scotch-Weld EPX application system for 2-component structural adhesives provides quick, economic, clean, precise processing and quick set-up times.

These 3M Scotch-Weld EPX structural adhesives offer significant advantages – at a low investment cost:

- Reducing costs for combining different materials for the same or better performance;
- Eliminating secondary sealing or finishing operations, saving time and money;
- Achieving stronger and stiffer structures by improving stress distribution;
- Joining a wide variety of materials that are unable to be assembled by traditional methods of fastening.



3M EPX adhesives selected for sign making are :

| Product Number | Colour | Mix Ratio | Work Life | Characteristics |
|----------------|-------------|-----------|-----------|--|
| DP 810 | Tan | 1:1 | 8 min. | Very good for plastics and metals. Good resistance to impact. For static and dynamic loads. |
| DP 8005 | Translucent | 10:1 | 3 min. | Innovative product for bonding LSE (Low Surface Energy) plastics together or to other materials, without the need for surface pre-treatment. |
| DP 8010 | Translucent | 10:1 | 10 min. | As per DP 8005, however with a longer worklife. |

3M™ Scotch-Weld™ Polyurethane Reactive Adhesive System

3M Scotch-Weld Polyurethane Reactive Adhesive Systems provide hot melt speed and structural strength performance with the following advantages :

- Fast initial set and handling strength in as few as 15 seconds helps eliminate or minimise fixturing and speed assembly.
- Holding power after only ten minutes exceeds strength of conventional hot melt and PVA adhesives.
- Thin, flexible and tough bond lines help improve the fit, appearance and durability of your products.
- Adhesive removes cleanly and easily prior to cure. Eliminates stress cracking in polycarbonate and acrylic.



3M Scotch-Weld Polyurethane Reactive Adhesive Systems selected for sign making is :

| Product Number | Colour | Work Life | Characteristics |
|----------------|-----------|-----------|---|
| TS 230 | Off white | 4 min. | Extrudable. Long set time for wide variety of plastics. Bonds aluminium and glass to most plastics and wood. |

Selection Guide for permanent bonding of signs

| | Metals | Composite | Plastics | Glass | Wood |
|-------------------------|--------|-----------|----------|-------|------|
| Post & Panel | 1,2 | 1,2,4 | 4 | 1,4 | 1* |
| Mounted letters | 1,2 | 1,2,4 | 4 | 1,4,5 | 1*,5 |
| Light Box | | | | 3 | |
| Box Signs | 1,2 | 1,2,4 | 1,4 | 1,4 | 1* |
| Pylons | 1,2 | 2 | 1 | 1 | 1* |
| Forecourts | 1,2 | 2 | 1 | 1 | 1* |
| Facias | 1,2 | 2 | 1 | 1 | 1* |
| Shop Signs | 1,2 | 1,2,4 | 1,4 | 1,4,5 | 1*,5 |

*Painted wood.

1. 3M™ VHB™ Leader
2. 3M AFT
3. 3M VHB clear
4. 3M Scotch-Weld™ EPX
5. 3M Scotch-Weld™ Polyurethane Reactive adhesive System

The selection guide is based on experience with 3M Bonding Solutions and the listed substrates and sign types. It is not an exhaustive list of products but more of a selection to help you choose the best type of bonding techniques according to your materials. It is therefore always recommended that you perform a test on your materials before starting an application. It is advised to consult your local 3M sales representative for further support, in particular the surface preparation and priming that may be required.





3M offers you a wide range of additional products for your daily activities

3M™ VHB™ Transfer Tapes and Laminating Adhesives

- 3M VHB Transfer Tapes are very thin clear tapes, as thin as 0.05mm, used for mounting lightweight aluminium letters onto shop signs.
- 3M Laminating Adhesives are transfer tapes used for bonding nameplates to office doors and for attaching directional and warning signs inside plants and offices. 3M 467MP and 3M 468MP are renowned products for these applications.



3M Masking Tapes

- 3M Masking Tapes are used for protecting materials during the painting process.
- The General Purpose Masking tape Scotch® 66°C 2214 can also be used for multipurpose applications like bundling of cables, lane marking.
- The Medium Performance Masking Tape Scotch® 121°C 2308 is specifically designed for bake paint masking applications. It can be used for temporary attachment of components.
- 3M Masking Tapes offer good curve masking; prevent paint bleed through; provide good adhesion and are easy to remove. They also minimize rework.



3M Commercial Graphics

- 3M Commercial Graphics products offer total graphics solutions for backlit signage
- 3M Panaflex and Panagraphics flexible sign materials to produce lightweight and impact resistant façades, canopies and awnings.
- 3M™ Scotchcal™ Translucent films for the production of durable decorations.
- Scotchcal 3630 translucent film has unique thermoformability capacities.
- Digitally printable films for the production of full color translucent capacities.
- 3M Light management films offering diffuser, blockout, Day/Night, light enhancement and dual color properties.



3M Protective Films

- 3M Protective Films safely protect various types of signs and displays during transportation and installation.
- A wide range of products covers protective needs for many different surfaces in interior as well as outdoor installations.



3M Abrasives

- Scotch-Brite™ Roloc™ Surface Conditioning Discs are aggressive yet conformable for use on right angle die grinder tools to remove contamination and prepare the surface for bonding without affecting the substrate.
- Scotch-Brite Handpads are non-contaminating nylon abrasive pads that can be used by hand to remove light corrosion and prepare the surface for bonding without affecting the substrate.
- Scotch-Brite Roloc Flap Brushes are conformable abrasive products for cleaning the surface of a metal panel and providing a satin brushed finish.



**Do you want to receive additional information on 3M Bonding Solutions
and on other 3M products :**



Please call us on :
136 136



or send us a fax :
02 9498 9247

or send us an e-mail :
3mauindmarketing@mmm.com



You can also easily find information on 3M Bonding Solutions from our Internet website :
www.3m.com



3M Australia Pty. Limited
950 Pacific Highway
Pymble NSW 2073
Tel: 136 136