



VHB™

4959F Acrylic Foam Tape

Product Data Sheet

Updated : October 1997
Supersedes : March 1996

Product Description

VHB Joining Systems utilise firm acrylic adhesives which have excellent long term holding power. The peel adhesion and tensile holding power

of products in the VHB family are significantly higher than typical pressure sensitive tape products.

Resistance to solvents, temperature extremes, and U. V. Light make VHB products suitable for many interior and exterior applications.

Physical Properties

Not for specification purposes

Adhesive Type	A-30	3M ref :
Thickness (ASTM D-3652) Tape Liner Total	3.00 mm ± 15 % 0.05 mm 3.05 mm	
Foam Density	720 kg/m ²	
Adhesive Carrier	Acrylic Foam (Closed Cell)	
Release Liner	Clear Polyester	
Tape Colour	White	
Shelf Life	24 months from date of despatch by 3M when stored in the original carton at 21°C (70°F) & 50 % Relative Humidity	

Performance

Characteristics

Not for specification purposes

Peel Adhesion to Stainless Steel 90° peel @ room temp, 72 hr dwell, jaw speed 300mm/min	35 N/10mm	
Static Shear Strength weight held for 10,000 mins to stainless steel with ½ sq in (3.23 sq cm) overlap	1500 g @ 22°C 1000 g @ 66°C 750 g @ 93°C	
Temperature Performance Max (minutes/hours) Max Continuous (days/weeks)	204 °C 150 °C	
Normal Tensile (T-Block) to Aluminium at room temp, 6.45 sq cm, jaw speed 50 mm/min	52 N/cm ²	

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Performance Characteristics (Cont.)
Not for specification purposes

Solvent Resistance	No apparent degradation when exposed to splash testing of most solvents including gasoline, JP-4 jet fuel, mineral spirits, motor oil, ammonia cleaner, acetone, methyl ethyl ketone. 20 seconds air dry.
UV Light Resistance	Excellent

Additional Product Information

Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and thus improving bond strength.

To obtain optimum adhesion, the bonding surfaces must be clean, dry and well unified. Typical surface cleaning solvents are isopropyl alcohol/water mixture (rubbing alcohol) or heptane. Use proper safety precautions for handling solvents.

It may be necessary to seal or prime some substrates prior to bonding.

a. Most porous or fibred materials (e.g. wood) will require sealing to provide a unified surface.

b. Some materials (e.g. copper, brass, plasticised vinyl) will require priming or coating to prevent interaction between adhesive and substrates.

Ideal tape application temperature range is 20 to 38°C. Initial tape application to surfaces at temperatures below 10°C is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory.

In some cases bond strength can be increased and ultimate bond strength can be achieved more quickly by exposure of the bond to elevated temperatures (e.g. 65°C) for one hour. This provides better adhesive wetout on to the substrates.

CAUTION

The following situations must be evaluated thoroughly to determine whether VHB products are suitable for the intended use.

1. Applications of 4959F which require performance at severe cold temperatures must be thoroughly evaluated, if the expected use will subject the VHB Joining System fastener to high impact stresses. For cold temperature applications from 0 to 10°C use 4951 (see VHB Special Feature products data sheet).

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Applications

VHB Joining Systems are suited for use in many interior and exterior industrial applications. In many situations, they can replace rivets, spot welds, liquid adhesives, and other permanent fasteners. Each product in the VHB family has specific strengths. These can include high tensile, shear and peel adhesion and resistance to solvents, moisture and plasticiser migration. All VHB tape should be thoroughly evaluated by the user under actual use conditions with intended substrates, especially if expected use involved extreme environmental conditions.

VHB Joining Systems are suitable for bonding a variety of substrates, including sealed wood, many plastics, composites and metals. Plastics which can be a problem are polyethylene, polypropylene, teflon, silicones and other low surface energy materials.

Plasticised vinyl bonding is dependent upon the types and concentrations of plasticisers which can migrate into the adhesives causing a reduction in bond strength; 4945 is most resistant to plasticiser migration. (see VHB Special Feature products data sheet).

Galvanised surfaces are potential problems and should be carefully evaluated.

To prevent corrosion on copper and brass, only lacquer coated material should be used with VHB Joining Systems.

Thorough evaluations are recommended when bonding is required to any questionable surface.

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Values presented have been determined by standard test methods and are average values not to be used for specification purposes. Our recommendations on the use of our products are based on tests believed to be reliable but we would ask that you conduct your own tests to determine their suitability for your applications. This is because 3M cannot accept any responsibility or liability direct or consequential for loss or damage caused as a result of our recommendations.



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