

VHB™

9469PC Adhesive Transfer Tape

Product Data Sheet

Updated : February 1996

Supersedes : October 1993

Product Description

A-10 is a very firm acrylic pressure-sensitive system. It features very high shear holding power. Bond strength increases substantially with natural ageing.

Physical Properties

Not for specification purposes

Adhesive Type	Acrylic	3M ref : A-10
Thickness (ASTM D-3652) Tape Liner Total	0.13 mm 0.10 mm 0.23 mm	5 Thou
Release Liner	Poly Coated Tan Paper.	
Tape Colour	Clear	
Shelf Life	12 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 Steel 90° peel @ room temp, 72 hr dwell jaw speed 300mm/min	13.1 N/100mm	Please see Peel Adhesion Continued on next page.
Static Shear Strength weight held for 10,000 mins to stainless steel with ½ sq in (3.23 sq cm) overlap	1000g @ 20°C 1000g @ 65°C 1000g @ 95°C 1000g @ 120°C 500g @ 150°C 500g @ 175°C	Minutes to failure 10,000+ 10,000+ 10,000+ 10,000+ 10,000+ 7,500+
Temperature Performance Minutes/Hours Days/Weeks	260°C 150°C	
Solvent Resistance	When properly laminated between two impervious materials, adhesive will resist mild acids and alkalis, most oils, grease, gasoline, kerosene, JP-4 fuel, hydraulic fluids and other typical aromatic and aliphatic hydrocarbon and ketone solvents.	

Performance Characteristics (Cont..) Not for specification purposes	UV Light Resistance	Excellent.																							
	Water Resistance	When properly laminated between two impervious materials and submitted to 100 hour immersion in water at 20°C the adhesive bond is not affected.																							
	Environmental Resistance	Peel adhesion tests on tapes applied to glass, stainless steel, and aluminium and subjected to 1000 hours Weather - Ometer exposure showed no decrease in bond strength and no degradation of the adhesive. Adhesive laminated between glass and clear polyester and exposed to Florida sunshine for 1 year showed no degradation of the adhesive.																							
	Insulation Resistance	>1 x 10 ⁶																							
	Peel Adhesion (Cont...) <small>90° peel @ room temp, 72 hr dwell, jaw speed 300mm/min</small>	<table border="1"> <tr> <td>Stainless Steel</td> <td>13.1</td> <td>N/10mm</td> </tr> <tr> <td>Aluminium</td> <td>13.1</td> <td>N/10mm</td> </tr> <tr> <td>Rigid Vinyl</td> <td>9.8</td> <td>N/10mm</td> </tr> <tr> <td>ABS</td> <td>7.7</td> <td>N/10mm</td> </tr> <tr> <td>Polycarbonate</td> <td>9.8</td> <td>N/10mm</td> </tr> <tr> <td>Glass</td> <td>9.8</td> <td>N/10mm</td> </tr> <tr> <td>Acrylic</td> <td>9.8</td> <td>N/10mm</td> </tr> <tr> <td>Epoxy</td> <td>9.8</td> <td>N/10mm</td> </tr> </table>	Stainless Steel	13.1	N/10mm	Aluminium	13.1	N/10mm	Rigid Vinyl	9.8	N/10mm	ABS	7.7	N/10mm	Polycarbonate	9.8	N/10mm	Glass	9.8	N/10mm	Acrylic	9.8	N/10mm	Epoxy	9.8
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Additional Product Information	Thermal Conductivity Watt/cm °C 0.0016	Dielectric Strength (Volts/25µm) 3,500 Volts	A-10 acrylic adhesive is designed for applications requiring high peel and shear strength. Performance data on various tests are shown above.
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Application Techniques	<p>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.</p> <p>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.</p> <p>It may be necessary to seal or prime some substrates prior to bonding.</p> <p>a. Most porous or fibred materials (e.g. wood) will require sealing to provide a unified surface.</p>	<p>b. Some materials (e.g. copper, brass, plasticised vinyl) will require priming or coating to prevent interaction between adhesive and substrates.</p> <p>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.</p> <p>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.</p>	<p>This provides better adhesive wetout on to the substrates.</p> <p>CAUTION</p> <p>The following situations must be evaluated thoroughly to determine whether VHB products are suitable for the intended use.</p> <p>Applications of 4950F 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).</p>
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Technical Bulletin

3M™ VHB™ Tape Durability

Moisture and Solvent Resistance

Adhesion tests have been performed on VHB™ Tape 4945 bonds of aluminum to aluminum that were subjected to over 10 years of submersion in 5% salt water and ordinary tap water. After testing, bright clean aluminum surfaces were observed underneath the adhesive bond. A combination of adhesive and cohesive failure modes were observed when the bond was broken which indicated very high performance levels. Long-term exposure to high humidity or water submersion can have the effect of making a polymer more resilient and tolerant of high elongation. A subsequent lowering in peak force is also measured after many days of exposure, usually on the order of 40%. This effect is typical as it parallels the increase in resilience and is the same trend often seen with structural silicone materials which are also recognized for their durability. Drying of the VHB™ Tape bond, which occurs in a normal environmental cycle, will show that this effect is reversible and that the bond will return to the original dry strength.

After splashes or incidental contact with solvents such as fuels, alcohols, adhesive removers like MEK, and even weak acids or bases, no affect is measured on the bond performance. Only after continuous submersion in harsh fuels or solvents is softening of the adhesive/foam experienced. **Note:** While VHB™ Tape products may withstand occasional contact with these types of chemicals, continuous exposure is not recommended.

UL Listing and Durability Testing

Both transfer tape and foam representatives of the VHB™ Tape family have UL 746C listings which involve stringent qualification tests and periodic monitoring by Underwriter's Laboratories. Qualification for this listing requires high-strength retention after extended exposure to high temperatures, humidity, cold, and cyclic conditions. The table below details VHB™ Tapes with the UL 746C listing, and substrate combinations, as well as the maximum listed temperature for each combination.

3M™ VHB™ Tapes
UL746C Listings - File MH 17478
Category QOQW2 Component - Polymeric Adhesive Systems, Electrical Equipment

Product Families	Substrates	Temp Rating
VHB™ Foam Tapes 4950, 4930, 4920	Aluminum, Stainless Steel, Galvanized Steel, Enameled Steel, Glass/Epoxy, Ceramic	110°C
	PBT	90°C
	Polycarbonate, ABS, unplasticized PVC	75°C
Conformable VHB™ Foam Tapes 4956, 4941, 4936, 4926	Ceramic	110°C
	Aluminum, Stainless Steel, Galvanized Steel, Enameled Steel, Polycarbonate, unplasticized PVC, Glass/Epoxy, PBT	90°C
	ABS	75°C
VHB™ Foam Tape 4945	Phenolic, Aluminum, Galvanized Steel, Alkyd Enamel	110°C
	Polyamide (Nylon), Polycarbonate, ABS	90°C
	Unplasticized PVC	75°C
VHB™ Adhesive Transfer Tapes F-9473PC, F-9469PC, F-9460PC	Stainless, Steel, Glass/Epoxy, Enameled Steel, Ceramic, Phenolic; Nickel Plated Steel (9469 only)	110°C
	ABS, Polycarbonate, Aluminum Galvanized Steel	90°C
	Unplasticized PVC	75°C