



Technical Data Sheet

3M™ VHB™ Adhesive Transfer Tape F9460PC

Product Description

Finite Element Analysis (FEA) data is available for this product at: [3m.com/FEA](https://www.3m.com/FEA)

3M™ VHB™ Adhesive Transfer Tape F9460PC utilizes the 3M™ High Performance Acrylic Adhesive 100MP, which has excellent long term holding power with much higher adhesion strength than typical pressure sensitive adhesive systems. This 3M™ VHB™ Adhesive Transfer Tape is transparent and is ideal for use in many interior and exterior industrial applications to replace rivets, spot welds, liquid adhesives, and other permanent fasteners.

Technical Information Note

The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Typical Physical Properties

Property	Values	Additional Information
Adhesive Type	Acrylic	
Liner	58# Polycoated Kraft Paper (PCK)	
Liner Thickness	0.106 mm	
Total Tape Thickness (mil)	2.3 mil	View
Test Method: ASTM D3652		
Total Tape Thickness (mm)	0.06 mm	View
Test Method: ASTM D3652		
Density	1.012 g/cm ³	
Density	0.04 lb/in ³	
Liner Print	3M VHB	

Liner Thickness 4.2 mil

UL Listing

3M™ Adhesive 100MP has UL 746C listings with different temperature ratings on many commonly used substrate materials as indicated in the table below. Qualification for this listing requires high strength retention after extended exposure to high temperatures, humidity, cold, and cyclic conditions.

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Substrates Temperature Rating

Stainless Steel, Glass/Epoxy, Enameled Steel,

Ceramic, Phenolic: 110°C

ABS, Polycarbonate, Aluminum, Galvanized Steel:

90°C

Unplasticized PVC: 75°C

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Our testing has shown that 3M™ Adhesive 100MP yielded 92% retention of peel adhesion after the roll was aged for more than 5 years at an elevated temperature of 150°F (65°C). The initial tack and liner release properties were still excellent. This testing result suggests that the tape is relatively unaffected by long-term exposure to elevated temperatures. Bonds made with 3M™ Adhesive 100MP can tolerate periodic short-term exposures to temperatures up to 500°F (260°C).

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3M™ Adhesive 100MP is thermoplastic in nature, becoming softer as temperature increases and firmer as temperature decreases. As the adhesive becomes firmer, the performance generally increases. This performance increase is demonstrated graphically in Figure 1 for 3M™ VHB™ Adhesive Transfer Tape F9473PC. It shows the breakaway and peel forces as a function of temperature. The exception of the performance increase is at very low temperatures when high impact stresses along with high frequencies are encountered. At low temperatures, the tape becomes very firm and glassy; the ability to absorb impact energy is reduced.

Dynamic Mechanical Properties











For engineers who have to use adhesive properties for modeling and analysis purpose, we suggest a Young's modulus of 4.5×10^2 kPA (measured at 23°C & 1 Hz) and a Poisson's ratio of 0.499. For detailed adhesive modulus and damping properties, please refer to the nomograph for 3M™ VHB™ Adhesive Transfer Tapes, which is available upon request through our technical service group. The nomograph presents adhesive modulus and damping properties as functions of temperature and frequency.

Typical Performance Characteristics

Additional Test notes

3M™ VHB™ Adhesive Transfer Tapes F9460PC, F9469PC, and F9473PC are made from the same adhesive system and are thermoplastic in nature, becoming softer as temperature increases and firmer as temperature decreases. As the adhesive becomes firmer, the adhesion performance generally increases. At low temperatures (lower than -40°F [-40°C]), the 3M™ VHB™ Adhesive Transfer Tape becomes very firm and glassy

Property	Values	Additional Information
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180° Peel Adhesion	12.3 N/cm	View 
<p>Test Method: ASTM D3330</p> <p>Backing: 2 mil Aluminum Foil</p> <p>Notes: 12 in/min (300 mm/min)</p>		
180° Peel Adhesion	112 oz/in	View 
<p>Test Method: ASTM D3330</p> <p>Backing: 2 mil Aluminum Foil</p> <p>Notes: 12 in/min (300 mm/min)</p>		
Normal Tensile	690 kPa	View 
<p>Test Method: ASTM D897</p> <p>Substrate: Aluminum</p>		
Normal Tensile	100 lb/in ²	View 
<p>Test Method: ASTM D897</p> <p>Substrate: Aluminum</p>		
Overlap Shear Strength	550 kPa	View 
<p>Test Method: ASTM D1002</p> <p>Substrate: Stainless Steel</p>		
Overlap Shear Strength	80 lb/in ²	View 
<p>Test Method: ASTM D1002</p> <p>Substrate: Stainless Steel</p>		
Short Term Temperature Resistance	260 °C	View 
<p>Notes: No change in room temperature dynamic shear properties following 4 hour conditioning at indicated temperature with 100 g/static load. (Represents minutes, hour in a process type temperature exposure).</p>		
Short Term Temperature Resistance	500 °F	View 
<p>Notes: No change in room temperature dynamic shear properties following 4 hour conditioning at indicated temperature with 100 g/static load. (Represents minutes, hour in a process type temperature exposure).</p>		
Long Term Temp C	149 °C	View 
<p>Notes: Maximum temperature where tape supports at least 250 g load per 0.5 in² in static shear for 10,000 minutes. (Represents continuous exposure for day or weeks).</p>		
Long Term Temp F	300 °F	View 
<p>Notes: Maximum temperature where tape supports at least 250 g load per 0.5 in² in static shear for 10,000 minutes. (Represents continuous exposure for day or weeks).</p>		
Short Term Temperature Resistance	500 °F	

Short Term Temperature Resistance 260 °C

Long Term Temperature Resistance 149 °C

Long Term Temperature Resistance 300 °F

Static Shear 1000 g [View](#) 


Test Method: ASTM D3654

Notes: Static shear measured at various temperatures and gram loadings on stainless steel. Will hold listed weight for 10,000 minutes.

Static Shear 1000 g [View](#) 

Test Method: ASTM D3654

Notes: Static shear measured at various temperatures and gram loadings on stainless steel. Will hold listed weight for 10,000 minutes.

Static Shear 1000 g [View](#) 


Test Method: ASTM D3654

Notes: Static shear measured at various temperatures and gram loadings on stainless steel. Will hold listed weight for 10,000 minutes.

Static Shear 1000 g [View](#) 

Test Method: ASTM D3654

Notes: Static shear measured at various temperatures and gram loadings on stainless steel. Will hold listed weight for 10,000 minutes.

Static Shear 500 g [View](#) 

Test Method: ASTM D3654

Notes: Static shear measured at various temperatures and gram loadings on stainless steel. Will hold listed weight for 10,000 minutes.

Static Shear 500 g [View](#) 

Test Method: ASTM D3654

Notes: Static shear measured at various temperatures and gram loadings on stainless steel. Will hold listed weight for 10,000 minutes.









Solvent Resistance

No apparent degradation when exposed to splash testing of many common solvents and fluids including gasoline, JP-4 fuel, mineral spirits, motor oil, ammonia cleaner, acetone and methyl ethyl ketone.
(3 splash testing cycles: 20 seconds submersion, & 20 seconds air dry.)








UV Resistance

Excellent UV resistance through outdoor weathering tests and weather-O-meter tests.



Available Sizes

Property	Values	Additional Information
Note	Subject to Minimum Order Requirements	
Standard Roll Length	55 m	
Standard Roll Length	60 yd	
Maximum Length	55 m	View 
Width: 1/4 in to 3/8 in widths		
Maximum Length	60 yd	View 
Width: 1/4 in to 3/8 in widths		
Maximum Length	220 m	View 
Width: 3/8 in to 1 in widths		
Maximum Length	240 yd	View 
Width: 3/8 in to 1 in widths		
Maximum Length	330 m	View 
Width: 1 in to 3 in		
Maximum Length	360 yd	View 
Width: 1 in to 3 in		
Maximum Length	330 m	View 
Width: 3 in and wider		
Maximum Length	360 yd	View 
Width: 3 in and wider		
Normal Slitting Tolerance	0.8 mm	
Normal Slitting Tolerance	±1/32 in	

Electrical and Thermal Properties

Property	Values	Additional Information
Insulation Resistance	> 1 x 10 ⁶ MΩ/in ²	View 
Test Method: ASTM D1000		
Dielectric Strength	1200 V	View 
Test Method: ASTM D149		
Dielectric Strength	1000 V	View 
Test Method: ASTM D149		
Dielectric Strength	1000 V	View 
Test Method: ASTM D149		
Dielectric Strength	4.08	View 
Test Method: ASTM D150		
Thermal Conductivity	0.16 W/m/K	View 
Test Method: ASTM C177		
Thermal Conductivity	1.1 (btu-in)/(h-ft ² -°F)	View 
Test Method: ASTM C177		
Coefficient of Thermal Expansion	770 x 10 ⁻⁶ m/m/°C	

Weight Loss and Outgassing Performance

Property	Values	Additional Information
Total Mass Loss	0.85 %	View 
Test Method: ASTM E595-77/84/90		
Volatile Condensable Materials	0 %	View 
Test Method: ASTM E595-77/84/90		
Note	The testing was done per ASTM E595-77/84/90 as indicated in the NASA Reference Publication 1124, Revision 4, "Outgassing Data for Selecting	

Spacecraft Materials”, June 1997. The results are reported as percentage of total mass loss (TML) and percentage of Volatile Condensable Materials (VCM), respectively, as shown below.

Storage and Shelf Life

Humidity controlled storage: 60° to 80°F (16° to 27°C) and 40-60% R.H.

If stored properly, product retains its performance and properties for 24 months from date of manufacture. If the products have been exposed to severe weather conditions, we suggest to precondition the products at the above storage conditions for at least 24 hours before using them.

Industry Specifications

UL 746C

UL 879 (File E65361)

Recognition/Certification

TSCA: These products are defined as articles under the Toxic Substances Control Act and therefore, are exempt from inventory listing requirements.

MSDS: These products are not subject to the MSDS requirements of the Occupational Safety and Health Administration’s Hazard Communication Standard, 29 C.F.R. 1910.1200(b)(6)(v). When used under reasonable conditions or in accordance with the 3M directions for use, the products should not present a health and safety hazard. However, use or processing of the products in a manner not in accordance with the directions for use may affect their performance and present potential health and safety hazards.

Note: One of 3M’s core values is to respect our social and physical environment. 3M is committed to comply with ever-changing, global, regulatory and consumer environmental, health, and safety (EHS) requirements. As a service to our customers, 3M is providing information on the regulatory status of many 3M products. Further regulation information including that for OSHA, USCPSI, FDA, California Proposition 65, READY and RoHS, can be found at 3M.com/regs.

Bottom Matter

3M

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Automotive Disclaimer

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Handling/Application Information

Application Techniques

Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure helps develop better adhesive contact and improve bond strength.

To obtain optimum adhesion, the bonding surfaces must be clean, dry, and well unified. Some typical surface cleaning solvents are isopropyl alcohol/water mixture or heptane.*

Ideal tape application temperature range is 70°F to 100°F (21°C to 38°C). Initial tape application to surfaces at temperatures below 50°F (10°C) is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory.

*Note: Be sure to follow the manufacturer's precautions and directions for use when using solvents.

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/p/d/b40065871/
Safety Data Sheet SDS	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=F9460PC

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

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