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3M™ Adhesive Transfer Tape 966

Product Description

The 3M™ Adhesive Transfer Tapes with 3M™ High Temperature Acrylic Adhesive 100 are designed for temperature exposure to 450°F (232°C) for short periods of time and/or solvent resistance. They have exceptional shear values even at elevated temperatures. They also offer low “outgassing” properties, which is an important consideration for the aerospace, automotive and electronic industries.

Product Features

3M™ Adhesive Transfer Tapes 941, 966, 9461P, 9461PC and 9462P use the same 3M™ High Temperature Acrylic Adhesive 100 and come with different liners for a variety of die cutting applications. 3M™ Adhesive Transfer Tape 965 uses a slightly modified 3M™ High Temperature Acrylic Adhesive 100 to provide excellent resistance to jet fuel and other chemicals for identification labels on aircraft.

- Excellent bond to metal and high surface energy plastics.
- Outstanding temperature and chemical resistance.
- Two adhesive thicknesses: 1 mil for thin profile labels and 2 mil for rougher surfaces.
- Low outgassing and low leachable chloride, important considerations for electronic and aerospace industries.
- Available on various liners for specialized processing:
  - 62# Densified Kraft for die-cutting metal nameplates
  - 55# Densified Kraft for rotary die-cutting specialty labels
  - 58# Polycoated Kraft for moisture stability

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	
Adhesive Thickness	0.06 mm	2.3 mil
Liner	62# Densified Kraft with “3M” printed in green	
Liner Thickness	3.6 mil	
Dispenser Selection	For assistance in helping you determine the best dispenser for your application, contact your local 3M sales representative, or the toll free 3M sales assistance number at 1-800-362-3550.	

Typical Performance Characteristics

Additional Test notes

Use on “Low Surface Energy Plastics” such as Polypropylene is not recommended. Consider priming Low Surface Energy substrates with 3M™ Tape Primer 94 or utilizing other 3M™ Adhesive Transfer Tapes designed for Low Surface Energy substrates such as 3M™ Adhesive 300LSE, 300MP, 350 or 300.

Static Shear	Test Condition
10,000 min	2000 g @ Room Temperature
10,000 min	1000 g @ 70°C (158°F)
10,000 min	1000 g @ 93°C (200°F)
10,000 min	500 g @ 177°C (350°F)
10,000 min	400 g @ 232°C (450°F)

Property: Static Shear
Method: ASTM D3654
notes: 1in x 1in size; test terminated after 10,000 minutes

90° Peel Adhesion		Dwell/Cure Time	Substrate
5.8 N/cm	53 oz/in	20 min @ Room Temperature	Stainless Steel
8.5 N/cm	78 oz/in	72 hr @ Room Temperature	Stainless Steel
15.9 N/cm	145 oz/in	Ultimate Bond	Stainless Steel
4.8 N/cm	44 oz/in	20 min @ Room Temperature	ABS
5.9 N/cm	54 oz/in	72 hr @ Room Temperature	ABS

Table continued on next page

Typical Performance Characteristics (continued)

90° Peel Adhesion		Dwell/Cure Time	Substrate
4.4 N/cm	40 oz/in	Ultimate Bond	ABS

Property: 90° Peel Adhesion
Method: ASTM D3330
Backing: 2 mil Aluminum Foil
notes: 12 in/min (300 mm/min)

Available Sizes

Property	Values	
Standard Length	180 yd	
Minimum Available Width	1 in	
Maximum Available Width	48 in	
Core Size (ID)	76.2 mm	3 in
Note	For other than standard sizes contact your 3M sales representative.	

Electrical and Thermal Properties

Insulation Resistance	Test Condition
>1 × 10^15 Ω	Before moisture resistance
1.5 × 10^11 Ω	Cycle #4
9.4 × 10^10 Ω	Cycle #10
9.7 × 10^12 Ω	24 hr after moisture resistance

Property: Insulation Resistance
Method: MIL-I-46058C
notes: test voltage = 100 VDC

Thermal Conductivity		Test Condition
0.103 (btu-ft)/(h-ft²-°F)	0.178 W/m/K	105°F(41°C)
0.106 (btu-ft)/(h-ft²-°F)	0.183 W/m/K	160°F(71°C)
0.108 (btu-ft)/(h-ft²-°F)	0.187 W/m/K	214°F(101°C)

Property: Thermal Conductivity
Method: ASTM C518

Electrical and Thermal Properties (continued)

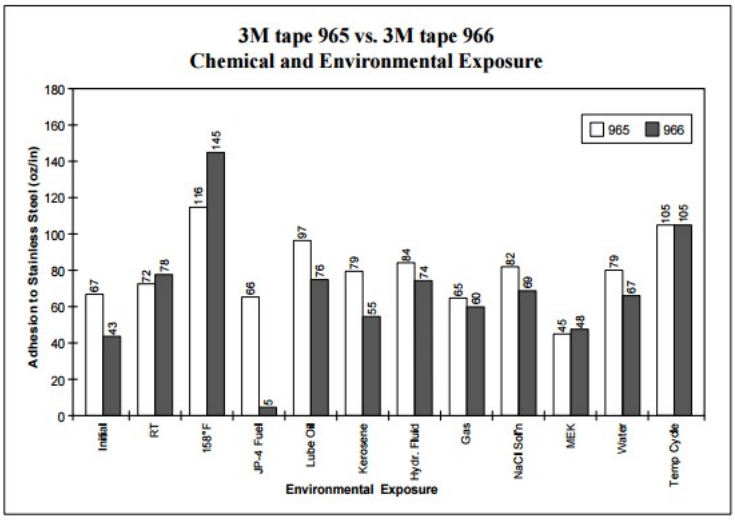
Property	Values	Method	Test Condition
Dielectric Constant	2.92	ASTM D150	1 KHz, Room Temperature
Dissipation Factor	0.025	ASTM D150	1 KHz, Room Temperature
Dielectric Strength	1100 V/mil	ASTM D149	500 vac, rms[60 hz/sec]
Volume Resistance	3.9 × 10^11 Ω		
Volume Resistivity	4 × 10^15 Ω-cm	ASTM D257	Room Temperature
Surface Resistance	>1 × 10^15 Ω		
Surface Resistivity	>5.6 × 10^16 Ω		
Coefficient of Thermal Expansion	19.9 × 10^-5 m/m/°C	ASTM D696	First Heat(125 - 175°C)
Coefficient of Thermal Expansion	58.4 × 10^-5 m/m/°C	ASTM D696	Second Heat(25 - 175°C)

Typical Environmental Performance

Chemical and Environmental Exposure

The 3M™ High Temperature Acrylic Adhesive 100 is well known in industry for environmental and chemical resistance. For many applications, any one of the products in this grouping will perform satisfactorily when exposed to different chemicals or temperatures. Jet fuels, however, are a challenge for pressure sensitive products. More specifically, the Aviation Turbine Fuel, Grade JP-4 (MIL H-T-5624), will attack many of the best adhesives within 72 hours. In response to the demands of this market and the corresponding military specification MIL-T- 9906C, 3M™ Adhesive Transfer Tape 965 was developed as it differs slightly in chemistry from the rest of the 3M adhesive 100 family to provide the extra chemical resistance.
In addition to the added fuel resistance, 3M tape 965 retains all of the notable features of the adhesive 100: excellent adhesion to metals, good adhesion to high surface energy plastics, low outgassing, and excellent static shear values for room temperature and heated conditions. The chart below shows adhesion values (to stainless steel) of 3M™ Adhesive Transfer Tapes 965 and 966, with an emphasis on fuel and oil exposure.
The data represents representative or typical values and should not be used for specification purposes.

Typical Environmental Performance (continued)



Environmental Performance

Bond Build-up:
The bond strength of 3M™ Adhesive 100 increases as a function of time and temperature.
Humidity Resistance:
High humidity has a minimal effect on adhesive performance. Bond strengths are generally higher after exposure for 7 days at 90°F (32°C) and 90% relative humidity.
U.V. Resistance:
When properly applied, nameplates and decorative trim parts are not adversely affected by outdoor exposure.
Water Resistance:
Immersion in water has no appreciable effect on the bond strength. After 100 hours in room temperature, the bond actually shows an increase in strength.
Temperature Cycling Resistance:
Bond strength generally increases after cycling four times through:

- 4 hours at 158°F (70°C)
- 4 hours at -20°F (-29°C)
- 16 hours at room temperature

Chemical Resistance:
When properly applied, nameplate and decorative trim parts will hold securely after exposure to numerous chemicals including gasoline, oil, Freon™ TF, sodium chloride solution, mild acids and alkalis.
Heat Resistance:
The 3M adhesive 100 is usable for short periods (minutes, hours) at temperatures up to 450°F (232°C) and for longer periods (days, weeks) up to 300°F (149°C).
Low Temperature Service: -40°F (-40°C). Parts should be tested for low temperature shock service.

Handling/Application Information

Application Ideas

Ideal tape application temperature range is 70°F to 100°F (21°C to 38°C) and application to surfaces at temperatures below 50°F (10°C) is not recommended for most pressure sensitive adhesives because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is satisfactory. For more specific information, contact Customer Service at 1-800-223-7427.
The liner used for 3M™ Adhesive Transfer Tapes 9461P, 9461PC and 9462P is not intended to provide premium release characteristics. Testing is urged for applications where liner release is critical. These products are not recommended for use with non-transferable facestocks such as 3M™ Label Material 8070, 8071 or 8074 because of the potential for liner caused pre-destruct.
3M™ Adhesive Transfer Tape 965 has been specially modified to provide outstanding performance for fuel line identification labels, bar code labels for harsh environments and specially performance-engineered labels for automotive, aerospace and industrial markets. It also meets MIL-T-9906C specification requirements.

Application Techniques

For maximum bond strength the surface should be thoroughly cleaned and dried. Typical cleaning solvents are heptane or isopropyl alcohol.*
Bond strength can also be improved with firm application pressure and moderate heat, from 100°F (38°C) to 130°F (54°C), causing the adhesive to develop intimate contact with the bonding surface.
*Note: Carefully read and follow the manufacturer's precautions and directions for use when working with solvents. These cleaning recommendations may not be compliant with the rules of certain Air Quality Management Districts in California; consult applicable rules before use.

Storage and Shelf Life

Humidity controlled storage 60°F (16°C) to 80°F (27°C) and 40 to 60% R.H. and in a plastic bag.
If stored properly, product retains its performance and properties for 24 months from date of manufacture.

Trademarks

References

Safety Data Sheet (SDS)

https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=966

Family Group

	941	965	966	9461P	9462P
Adhesive Thickness (mm)	0.6	0.6	0.06	0.03	0.06
Liner	58# Polycoated Kraft	55# Densified Kraft liner	62# Densified Kraft with "3M" printed in green	55# Densified Kraft with "3M" printed in green	55# Densified Kraft with "3M" printed in green

ISO Statement

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

Recognition/Certification

TSCA: These products are defined as articles under the Toxic Substances Control Act and therefore, are exempt from inventory listing requirements. Additional regulatory information for IATD products is available on the regs website: www.3m.com/regs. MSDS: 3M has not prepared a MSDS for these products which 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. UL: 3M™ Adhesive Transfer Tapes 941, 966 and 9462P have been recognized by Underwriters Laboratories Inc. under Standard UL 969 Marking and Labeling in File MH26206. For more information on the UL Certification, please visit the website at http://www.3m.com/converter, select UL Recognized Materials, and then select the specific product area.

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