



3M™ High Temperature Acrylic Adhesive 100

941, 965, 966, 9461P, 9461PC, 9462P

Technical Data

June, 2014

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.

Construction 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.

3M™ Adhesive Transfer	Adhesive Thickness (mils)	Liner Material - Thickness
Tape 941	2.3 (.06 mm)	58# Polycoated Kraft - 4.0 mils thick
Tape 966	2.3 (.06 mm)	62# Densified Kraft - 3.8 mils thick with printed liner
Tape 9461P	1.16 (.03 mm)	55# Densified Kraft - 3.2 mils thick with printed liner
Tape 9461PC	1.16 (.03 mm)	58# Polycoated Kraft - 4.0 mils thick
Tape 9462P	2.3 (.06 mm)	55# Densified Kraft - 3.2 mils thick with printed liner
Tape 965	2.3 (.06 mm)	55# Densified Kraft - 3.2 mils thick with printed liner

***Note:** The caliper listed is based on a calculation from manufacturing controlled adhesive coat weights using a density of 1.012 g/cc. While past data pages have listed nominal thicknesses of 1 mil and 2 mils, the coat weight (and theoretical caliper) has not changed.

3M™ Adhesive Transfer Tapes with Adhesive 100

941, 965, 966, 9461P, 9641PC, 9462P

Typical Physical Properties and Performance Characteristics

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

Adhesion Peel: ASTM D-3330 (modified) (90 degree peel, 12"/min. [305 mm/min.] 2 mil aluminum)

Metal (Stainless Steel)

3M™ Adhesive Transfer	20 minute dwell		72 hr. dwell		Ultimate bond	
	oz./in.	N/100mm	oz./in.	N/100mm	oz./in.	N/100mm
Tape 941	53	58	78	85	145	159
Tape 965	45	49	72	79	116	127
Tape 966	53	58	78	85	145	159
Tape 9461P	48	53	85	93	119	130
Tape 9461PC	48	53	85	93	119	130
Tape 9462P	53	58	78	85	145	159

High Surface Energy Plastic (ABS)

3M tape 941	44	48	54	59	40	44
3M tape 965	–	–	69	75	45	49
3M tape 966	44	48	54	59	40	44
3M tape 9461P	–	–	36	39	18	20
3M tape 9461PC	–	–	36	39	18	20
3M tape 9462P	44	48	54	59	40	44

Use on “Low Surface Energy Plastics” such as Polypropylene is not recommended. Consider other 3M™ Adhesive Transfer Tapes with 3M™ Adhesive 300, 300MP, 350 or 300LSE.

Adhesive Static Shear

Values for all 3M™ Adhesive 100 family of tapes on Stainless Steel (1 x 1 inch test samples)

Room temperature	2000 gms for 10,000 minutes
158°F (70°C)	1000 gms for 10,000 minutes
200°F (93°C)	1000 gms for 10,000 minutes
350°F (177°C)	500 gms for 10,000 minutes
450°F (232°C)	400 gms for 10,000 minutes

Note: 3M tape 965 showed some slippage at evaluated temperatures above 200°F (93°C).

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Typical Physical Properties and Performance Characteristics (continued)

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

Typical Liner Release Values: Liner release values may vary from lot to lot. Values stated are only typical or average values based on lots tested.

3M™ Adhesive Transfer	
Tape 941	23 gms/inch
Tape 965	22 gms/inch
Tape 966	39 gms/inch
Tape 9461P	29 gms/inch
Tape 9461PC	35 gms/inch
Tape 9462P	30 gms/inch

Environmental Performance

The properties defined are based on the attachment of impervious faceplate materials (such as aluminum) to an aluminum test surface.

- 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.

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Available Size	Core size:	3M™ Adhesive Transfer Tapes are offered on a three inch paper core.
	Minimum width:	1 inch 3 inch for 3M™ Adhesive Transfer Tape 9462P
	Maximum width:	48 inches
	Standard length:	180 yards

For other than standard sizes contact your 3M sales representative.

Features

- 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:
 - 60# Densified Kraft for die-cutting metal nameplates
 - 55# Densified Kraft for rotary die-cutting specialty labels
 - 58# Polycoated Kraft for polycarbonate graphics
 - 86# Polycoated Kraft for polycarbonate end tabs and plastic nameplates on a common sheet

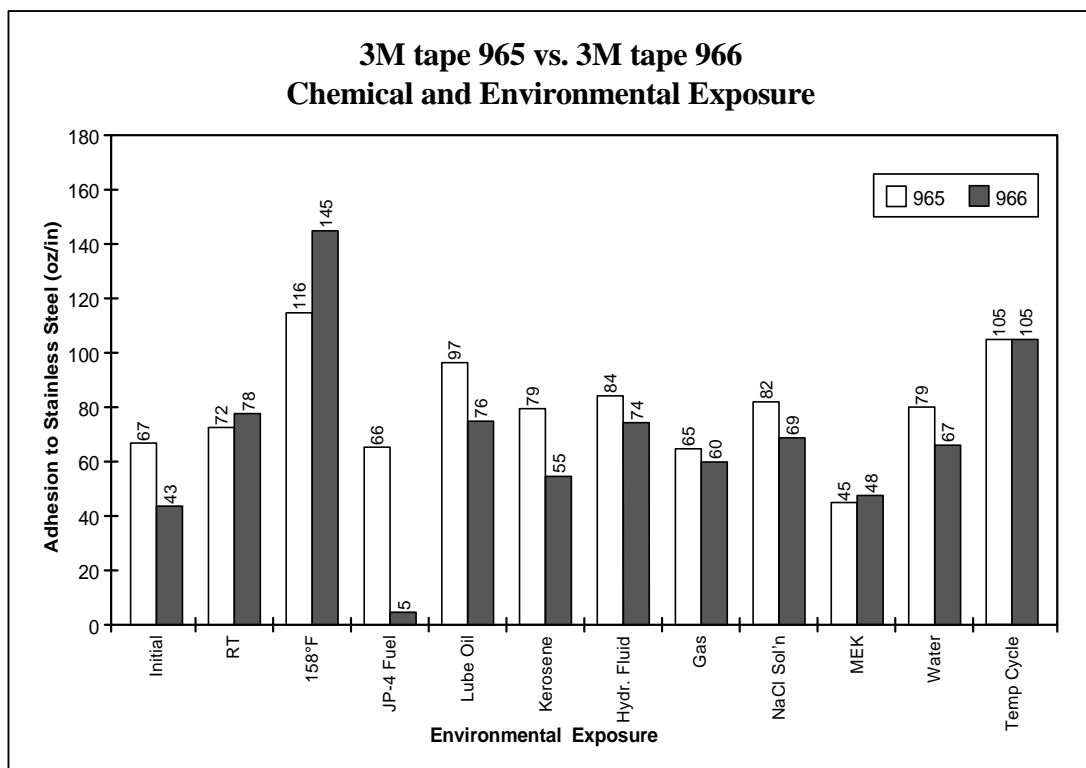
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Chemical and Environmental Exposure

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.**



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Thermal and Electrical Properties for 3M tape 966

3M™ Adhesive Transfer Tape 966 was tested for the following properties; however, the results should be very similar for the other 3M™ Adhesive Transfer Tapes with 3M™ High Temperature Acrylic Adhesive 100.

Thermal Conductivity (ASTM C518)	.103 BTU-ft/ft ² -hr-°F (@105°F) .106 BTU-ft/ft ² -hr-°F (@160°F) .108 BTU-ft/ft ² -hr-°F (@214°F) .178 Watt/m-K (@41°C) .183 Watt/m-K (@71°C) .187 Watt/m-K (@101°C)
Coefficient of Thermal Expansion (ASTM-D696) First heat (125-175°C) Second heat (25-175°C)	19.9 x 10 ⁻⁵ m/m/°C 58.4 x 10 ⁻⁵ m/m/°C
Insulation Resistance (test voltage = 100 VDC, MIL-I-46058C) Before moisture resistance Cycle #4 Cycle #10 24 hr after moisture resistance	>1.0 x 10 ¹⁵ ohms 1.5 x 10 ¹¹ ohms 9.4 x 10 ¹⁰ ohms 9.7 x 10 ¹² ohms
Surface Resistance	>1.0 x 10 ¹⁵ ohms
Surface Resistivity	>5.6 x 10 ¹⁶ ohms
Volume Resistance	3.9 x 10 ¹¹ ohms
Volume Resistivity (ASTM D257-92)	4.0 x 10 ¹⁵ ohm-cm
Dissipation Factor	0.025 (@1 kHz)
Dielectric Constant (ASTM D-150-92)	2.92 (@1 kHz)
Dielectric Strength (500 vac, rms. [60 Hz]/sec.) (ASTM D149-92)	1100 volts/mil

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.

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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.

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.

Storage

Humidity controlled storage 60°F (16°C) to 80°F (27°C) and 40 to 60% R.H. and in a plastic bag.

Shelf Life

If stored properly, product retains its performance and properties for 18 months from date of shipment.

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Certification/ Recognition

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.

Product Use

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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ISO 9001

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



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Printed in U.S.A.
©3M 2014 70-0709-3907-2 (11/06)