



Adhesive Transfer Tapes with Adhesive 220

9502 • 9502HL • 9502R • 9505 • 9505HL • 9505R

Technical Data

October, 2003

Product Description

3M™ Adhesive Transfer Tapes with 3M™ Adhesive 220 is an economical choice for general industrial bonding of metals, painted metals and high surface energy plastics.

Construction

Product Number	Adhesive Type/Color	Adhesive Thickness ¹ (mils, mm)	Liner Color, Type, Print	Liner Caliper
3M™ Adhesive Transfer Tape 9502	220/ Clear	2.3 mils (0.06 mm)	Tan, 58#, Polycoated Kraft with green "3M" logo	4.2 mils
3M™ Adhesive Transfer Tape 9505	220/ Clear	4.9 mils (0.12 mm)	Tan, 58#, Polycoated Kraft with green "3M" logo	4.2 mils
3M™ Adhesive Transfer Tape 9502HL	220/ Clear	2.3 mils (0.06 mm)	Tan, 83#, Polycoated Kraft with green "3M" logo	6.2 mils
3M™ Adhesive Transfer Tape 9505HL	220/ Clear	4.9 mils (0.12 mm)	Tan, 83#, Polycoated Kraft with green "3M" logo	6.2 mils
3M™ Adhesive Transfer Tape 9502R	220/ Clear	2.3 mils (0.06 mm)	White, Polycoated Glassine with white "3M" logo	3.5 mils
3M™ Adhesive Transfer Tape 9505R	220/ Clear	4.9 mils (0.12 mm)	White, Polycoated Glassine with white "3M" logo	3.5 mils

Note 1: 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 calipers of 2 and 5 mils, the coat weight (and theoretical caliper) has not changed.

When bonding a thin, smooth, flexible material to a smooth surface, it is generally acceptable to use 2 mils of adhesive. If a texture is visible on one or both surfaces, the 5 mil adhesive would be suggested. If both materials are rigid, it may be necessary to use a thicker adhesive to successfully bond the components. 3M™ VHB™ Acrylic Foam Tapes may be required (please refer to the data page for VHB tapes).

Liner configuration guide:

General purpose steel rule die cutting	58# polycoated kraft (PCK)
Steel rule cutting many nameplates on common sheet	83# PCK
Kiss cutting, steel rule	83# PCK
Rotary die cutting	3.5 mil polycoated glassine (PCG)

The polycoated kraft and glassine liners are more resistant to humidity curl and wrinkling than standard plain paper liners.

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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.

I. Adhesion to stainless steel

ASTM D3330 modified (90 degree peel, 2 mil aluminum foil backing)

Dwell on stainless steel:	2.3 mil (.0023 inches)		4.9 mil (.0049 inches)	
	Oz./In.	N/100 mm	Oz./In.	N/100 mm
15 minute room temperature (RT)	40	44	53	58
72 hour RT	74	80	98	107
72 hour 158°F (70°C)	131	143	173	189

II. Adhesion to Other Surfaces²

ASTM D3330 modified (90 degree peel, 2 mil aluminum foil backing)

Dwell/substrate:	2.3 mil (.0023 inches)		4.9 mil (.0049 inches)	
	Oz./In.	N/100 mm	Oz./In.	N/100 mm
72 hour RT ABS	55	60	65	71
72 hour RT glass	70	77	89	97
72 hour RT polycarbonate	55	60	63	69

III. Relative High Temperature Operating Ranges

Short term (minutes/hours)	350°F (177°C)
Long term (days/weeks)	250°F (121°C)

IV. Static Shear - ASTM D3654 - 1" x 1" sample area - aluminum foil to stainless steel

Temperature	Load	Minutes to Failure	
		2 mil	5 mil
70°F (21°C)	2000 grams	5,000	5,000
158°F (70°C)	1000 grams	4,000	4,000

V. Shelf Life of Tape in Roll Form

24 months from the manufacturing date when stored at 70°F (21°C) and 50% relative humidity.

VI. Environmental Performance

The 3M™ Adhesive 220 family is resistant to occasional splashes of organic materials including MEK, automotive oil, weak acid and base solutions and gasoline. These adhesives are also resistant to humidity and intermittent water exposure.

VII. Low Service Temperature

The glass transition temperature, T_g, for 3M adhesive 220 is -31°F (-35°C). Many applications survive below this temperature. Factors to consider are: the materials being bonded, the dwell at RT before cold exposure and the stresses below the T_g (ie. expansion/contraction stresses, impact). Optimum conditions are: bonding HSE materials, longer time at RT before cold exposure and little or no stress below the glass transition temperature.

Note 2: 3M adhesive 220 is not recommended for low energy plastics (polypropylene, polyethylene, powder coated paints). For these surfaces please refer to the 3M™ Adhesive 300, 350, 300 LSE and 300MP product families.

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Available Sizes	Product Number	Master Size	Slit Width (minimum)	Roll Length ³	Core Size	Slit Tolerance
	3M™ Adhesive Transfer Tape 9502 3M™ Adhesive Transfer Tape 9505	48" and 60"	1/2"	60 - 360 yards	3"	± 1/32"
	3M™ Adhesive Transfer Tape 9502HL 3M™ Adhesive Transfer Tape 9505HL	48"	1/2"	60 - 360 yards	3"	± 1/32"
	3M™ Adhesive Transfer Tape 9502R 3M™ Adhesive Transfer Tape 9505R	48"	1/2"	60 - 360 yards	3"	± 1/32"

Note 3: Roll lengths vary by product slit width (the customer service department has more detailed information, 1-800-328-1681).

Application Techniques

For maximum bond strength (during installation of the final part) the surface should be thoroughly cleaned and dried. Typical cleaning solvents are heptane (for oily surfaces) or isopropyl alcohol for plastics.* Use reagent grade solvents since common household materials like rubbing alcohol frequently contain oils to minimize the drying affect on skin. These oils can interfere with the performance of a pressure-sensitive adhesive. Also, use disposable wipes, that do not contain oils, to remove the cleaning solvents.

***Note:** Carefully read and follow cleaning solvent manufacturer's precautions and directions for use. These cleaning recommendations may not be compliant with the rules of certain Air Quality Management Districts in California; consult applicable rules before use.

It is necessary to provide pressure during lamination (10-20 pli recommended) and during final part installation (10-15 psi) to allow the adhesive to come into direct contact with the substrate. Using a hard edged plastic tool, which is the full width of the laminated part, helps to provide the necessary pressure at the point of lamination. Heat can increase bond strength when bonding to metal parts (generally this same increase is observed at room temperature over longer times, weeks). For plastic parts, the bond strength is not enhanced with the addition of heat.

The ideal adhesive application temperature range is 70°F (21°C) to 100°F (38°C). Application is not recommended if the surface temperature is below 50°F (10°C) because the adhesive becomes too firm to adhere readily. Once properly applied, at the recommended application temperature, low temperature holding is generally satisfactory (please refer to section VII of the Typical Physical Properties and Performance Characteristics).

Application Equipment

To apply adhesives in a wide web format, lamination equipment is required to ensure acceptable quality. To learn more about working with pressure-sensitive adhesives please refer to technical bulletin, Lamination Techniques for Converters of Laminating Adhesives (70-0704-1430-8).

For additional dispenser information, contact your local 3M sales representative, or the toll free 3M sales assistance number at 1-800-362-3550.

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Application Ideas

- Attachment of nameplates, appliques and decorative trim to metal and high surface energy plastics.
- Lamination to sub-surface printed polycarbonate or polyester graphic overlay materials.
- Used in the automotive, appliance and electronic industries for cost-effective, long-term bonding applications.

For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-223-7427 or visit www.3M.com/converter. Address correspondence to: 3M Industrial Adhesives and Tapes Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

Certification/ Recognition

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.

UL: Many of these products have been recognized by Underwriters Laboratories Inc. under Standard UL 969, Marking and Labeling Systems Materials Component. For more information on the UL Certification, please visit the 3M website at <http://www.3m.com/converter>.

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 can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

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



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3M Center, Building 21-1W-10, 900 Bush Avenue
St. Paul, MN 55144-1000



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