



# High Temperature PSA Solutions for Electronic Component Attachments

Technical Bulletin

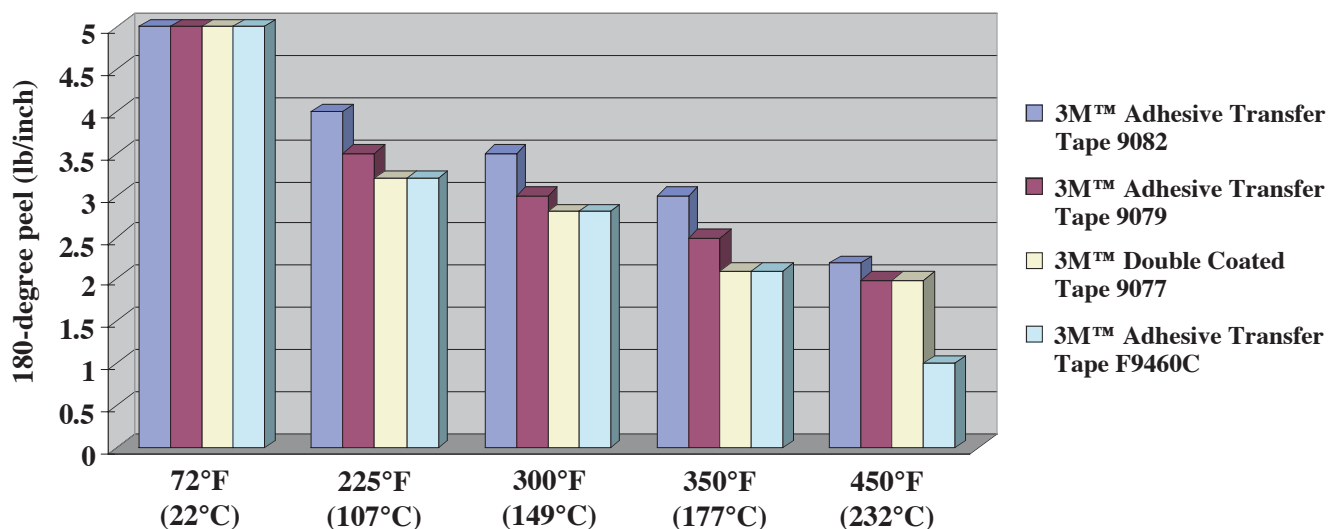
February, 2007

This technical bulletin presents a comparative performance at high temperatures of various pressure sensitive adhesive tapes. Of particular interest is the thermal stability performance on adhesion strength, weight loss, and long-term and short-term survival temperature tolerances. This technical bulletin deals with high temperature applications, for example, PCB attachment for lead-free electronic components would require high temperature rated adhesives able to resist temperatures higher than 260°C (500°F).

Three types of 3M high temperature adhesive systems are currently used in many industrial applications and are designated as 100MP, 100HT & 100HTL, respectively. This bulletin provides a quick summary on the selected adhesive products with emphasis on their high temperature performance. The objective is to help engineers to select the right solution to meet specific design requirements. For more detailed adhesive performance and properties, refer to the data pages.

**Note: The data presented in this technical bulletin are best estimates for the current product constructions, and they should not be used for specifications purpose.**

## (1) Peel Adhesion versus Temperature on Aluminum (per ASTM D3330 for 180-degree Peel Adhesion with a dwell time of 2 minutes at testing temperatures)



# Technical Bulletin

## High Temperature PSA Solutions for Electronic Component Attachments

### (2) Product Constructions & Suggested Maximum Temperature Tolerances

Adhesive Family	Adhesive Products	Liner and Adhesive Description	Maximum Temperature Tolerances		
			Adhesive		Liner
			Long Term (Hours, Days)	Short Term (Minutes)	Short Term (Minutes)
<b>100MP Acylic</b>	3M™ Adhesive Transfer Tape F9460PC	Liner: 0.004" thick 58# Polycoated Kraft Paper Adhesive: 0.002" thick	150°C (300°F)	230°C (450°F)	125°C (260°F)
	3M™ Adhesive Transfer Tape F9469PC	Liner: 0.004" thick 58# Polycoated Kraft Paper Adhesive: 0.005" thick	150°C (300°F)	230°C (450°F)	125°C (260°F)
	3M™ Adhesive Transfer Tape F9473PC	Liner: 0.004" thick 58# Polycoated Kraft Paper Adhesive: 0.010" thick	150°C (300°F)	230°C (450°F)	125°C (260°F)
<b>100HT Acylic</b>	3M™ Adhesive Transfer Tape 9082	Liner: 0.031" thick Densified Kraft Paper Adhesive: 0.002" thick	175°C (350°F)	280°C (540°F)	230°C (450°F)
	3M™ Adhesive Transfer Tape 9085	Liner: 0.031" thick Densified Kraft Paper Adhesive: 0.005" thick	175°C (350°F)	280°C (540°F)	230°C (450°F)
<b>100HTL Acylic</b>	3M™ Adhesive Transfer Tape 9079	Liner: 0.035" thick High Temperature Paper Adhesive: 0.002" thick	175°C (350°F)	275°C (530°F)	260°C (500°F)
	3M™ Double Coated Tape 9077	Liner: 0.035" thick High Temperature Paper Adhesive: 0.002" thick	175°C (350°F)	275°C (530°F)	260°C (500°F)

# Technical Bulletin

## High Temperature PSA Solutions for Electronic Component Attachments

### (3) Weight Loss at High Temperatures (Isothermal TGA Analysis)

The testing is done using a constant temperature Thermogravimetric Analysis (TGA). Samples were analyzed by tested in a TA Instruments 2950 HI-RES Modulated Thermogravimetric running under air atmosphere in standard mode. The sample temperature was increased from ambient (22°C) to the desired temperature using the instruments highest heating rate and maintained at that temperature for the designated dwell time. Results are reported as percent of total weight loss (% TWL).

Adhesive Family	Adhesive Products	Aging Condition (Temperature & Dwell Time)		
		150°C (300°F) for 3.5 hours	175°C (350°F) for 3.5 hours	130°C (265°F) for 10 hours
<b>100MP Acrylic</b>	3M™ Adhesive Transfer Tape F9460PC	> 1%	> 10%	> 5%
	3M™ Adhesive Transfer Tape F9469PC	> 1%	> 10%	> 5%
	3M™ Adhesive Transfer Tape F9469PC	> 1%	> 10%	> 5%
<b>100HT Acrylic</b>	3M™ Adhesive Transfer Tape 9082	< 1%	< 1.5%	< 1%
	3M™ Adhesive Transfer Tape 9085	< 1%	< 2%	< 1%
<b>100HTL Acrylic</b>	3M™ Adhesive Transfer Tape 9079	< 1%	< 2%	< 1%
	3M™ Double Coated Tape 9077	< 2%	< 3%	< 2%

# Technical Bulletin

## High Temperature PSA Solutions for Electronic Component Attachments

---

### 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.

---

### Warranty and Limited Remedy

Unless stated otherwise in 3M's product literature, packaging inserts or product packaging for individual products, 3M warrants that each 3M product meets the applicable specifications at the time 3M ships the product. Individual products may have additional or different warranties as stated on product literature, package inserts or product packages. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's application. If the 3M product is defective within the warranty period, your exclusive remedy and 3M's and seller's sole obligation will be, at 3M's option, to replace the product or refund the purchase price.

---

### Limitation of Liability

Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

**ISO 9001:2000**

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001:2000 standards.

# 3M

**Industrial Business  
Converters Markets  
Industrial Adhesives and Tapes Division**

3M Center, Building 21-1W-10, 900 Bush Avenue  
St. Paul, MN 55144-1000  
800-223-7427 • 651-778-4244 (fax)  
www.3M.com/converter



*Recycled Paper  
40% pre-consumer  
10% post-consumer*

3M is a trademark of 3M Company.  
Printed in U.S.A.  
©3M 2006 70-0713-4483-5 (2/07)