



# Scotch-Weld™

## Self-Extinguishing Hot Melt Adhesive

### 3748 VO

Technical Data

August, 2006

#### Product Description

3M™ Scotch-Weld™ Hot Melt Adhesive 3748 VO is a tough, flexible, thermoplastic hot melt, 100% solids adhesive which exhibits good peel adhesion and thermal shock properties along with higher heat resistance. It features excellent electrical properties which make it ideal for use on printed wiring board and other electronic bonding applications.

Scotch-Weld Hot Melt Adhesive 3748 VO is self-extinguishing and has a UL 94 VO rating. In addition to electronic applications, it is also useful in many general industrial bonding and sealing applications where a self-extinguishing characteristic is required.

#### Features

- Excellent Adhesion
- Good Electrical Properties
- Non Corrosive to Metal

#### Typical Physical Properties

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

<b>Base Resin:</b>	Polyolefin
<b>Color:</b>	Light Yellow
<b>Specific Gravity:</b>	1.09
<b>Ball and Ring Softening Point:</b>	305°F (152°C)
<b>Viscosity:</b> @ 356°F (180°C) @ 392°F (200°C) @ 428°F (220°C)	8,500 cps 5,000 cps 3,300 cps
<b>UL 94 (Flammability Classification):</b>	V-0
<b>Shore D Hardness (ASTM D 2240):</b>	26 @ 77°F (25°C)
<b>Suggested Application Equipment:</b> <ul style="list-style-type: none"><li>– 3M™ Scotch-Weld™ Hot Melt Applicator TC or TCQ</li><li>– 3M™ Scotch-Weld™ Hot Melt Applicator EC - Temperature Module #4</li><li>– 3M™ Scotch-Weld™ Hot Melt Applicator PG II</li></ul>	

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## Typical Performance Properties

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

<b>Two Pound Dead Load Heat Resistance</b> (3M TM C 3093) <sup>(1)</sup>	175°F (79°C)
<b>Overlap Shear Strength @ 70°F (21°C)</b> (3M TM C 3096) <sup>(2)</sup> FR-4 to FR-4 Fir to Fir Polypropylene to Polypropylene Polyethylene to Polyethylene	215 psi 275 psi 250 psi 220 psi
<b>180° Peel Adhesion</b> (3M TM C 3168) <sup>(1)</sup> Wire Mesh to FR-4 to PP to PE to Fir	38 piw 35 piw 27 piw 26 piw
<b>Weight Loss by TMA (In Air)</b> Temperature of weight loss at 5°C/min	1% @ 459°F (237°C) 5% @ 621°F (327°C) 10% @ 673°F (356°C)
<b>Thermal Coefficient of Expansion by TMA</b> Over -100 to -40°C temperature range Over -20 to 25°C temperature range	-34.0 x 10 <sup>-6</sup> units/units/°C 154.5 x 10 <sup>-6</sup> units/units/°C
<b>Thermal Conductivity (@ 41°C [107°F] on .020" samples)</b> BTU-ft./ft <sup>2</sup> -hr. - °F Cal./sec. - cm - °C Watt/m - °C J/cm - sec - °C	1.11 x 10 <sup>-1</sup> 4.58 x 10 <sup>-4</sup> 1.92 x 10 <sup>-1</sup> 1.92 x 10 <sup>-3</sup>
<b>Thermal Shock Resistance</b> Potted Washer Olyphant test (3M TM C3167) + 100°C (air) to -40°C (liquid)	Passes 5 cycles w/o cracking

- (1) 1" x 4" Douglas Fir specimens are bonded with hot melt adhesive using a 1" overlap shear configuration. Bonds are then conditioned for 24 hours at 70°F (22°C), 50% relative humidity before testing. Bonds are subjected to 2 lbs. per square inch load at 100°F (49°C) for 30 minutes. Temperature of the bond line is raised every 30 minutes until failure. Heat resistance recorded is the last temperature prior to bond failure.
- (2) 1" x 4" Douglas Fir specimens are bonded with hot melt adhesive using a 1" overlap and 13 mil wire spacer to set bond line thickness. Bonds are then conditioned for 24 hours at 70°F (22°C), 50% relative humidity before testing. Bonds are pulled in shear at a separation bond speed of 2 inch a minute recording strength at failure.
- (3) Test involves bonding .020" wire mesh (galvanized window screen type) to substrate using hot melt adhesive. Wire mesh is encapsulated with adhesive. After conditioning, bond is tested by 180° peel back method using Instron at 10 inches per minute peel speed.

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## Typical Electrical Properties

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

	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	100 MHz
<b>Dielectric Constant</b> (ASTM D 150)	2.3	2.3	2.3	2.3	2.3	2.3
<b>Dissipation Factor</b> (ASTM D 150)	.002	.001	.001	.001	.001	.001
<b>Dielectric Strength</b> (ASTM D 149)	1400 volts/mil (11 mil sample)					
<b>Volume Resistivity</b> (ASTM D 257)	6.0 x 10 <sup>17</sup> ohm-cm					
<b>Surface Resistivity</b> (ASTM D 257)	4.5 x 10 <sup>17</sup> ohm/sq.					

## Typical Corrosion Properties

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

<b>Per ASTM D 3482</b> (35°C/96% RH/45 v.d.c/15 days)	Pass – No electrolytic corrosion.
<b>Per TM C 708*</b> (45°C/96% RH/250 v.d.c/5 days)	Pass – No electrolytic corrosion. Very minor surface oxidation of test wire.
<b>Per Mil S-46163</b> (10 days/50% RH/23°C)	Pass – No aluminum, brass or steel corrosion or discoloration.

\*Test involves placing two #36 AWG (.005") oxygen free bare copper wires on clean 1" x 4" glass slides in fixed position 1/4" apart. Adhesive is coated over the wires and over the area between the wires in a uniform manner and cured/set. The test specimen is then subjected to 45°C / 96% relative humidity / 250 volts d.c. for 5 days. The aged specimen is then visually examined for corrosion/attack of the copper surface

## Typical Solvent Resistance

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

	1 Hour	30 Days
Acetone	A	B
Isopropyl Alcohol	A	B
Freon® TF	B	C
Freon® TMC	B	C
1, 1, 1 - trichloroethylene	B	C
RMA Flux	A	B

**Key:** A = No attack  
B = Slight Surface Attack/Softness  
C = Severe Attack/Breakup

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<b>Storage</b>	Store below 120°F (49°C).
<b>Shelf Life</b>	When stored at the recommended conditions, this product has a shelf life of 2 years from the date of manufacture.
<b>Precautionary Information</b>	Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.
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**ISO 9001:2000**

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



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