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Raychem

Specification	**RT-1050/6**
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THERMOFIT® ADHESIVE AND SEALANT
THERMOFIT S-1030

Thermofit S-1030 is a general purpose, flexible, thermoplastic adhesive based on a modified polyolefin composition and is supplied in tape form (3/4"x.01"x33 feet). It is also furnished as a coating on the interior of molded parts in accordance with the applicable specification control drawings. This material was developed to bond Thermofit heat-shrinkable products where flexibility is desired at low temperatures. Thermofit S-1030 adhesive bonds to many materials such as polyolefins, neoprene and to many metals such as steel and aluminum.

PROPERTY	UNIT	REQUIREMENT	METHOD OF TEST
PHYSICAL			
Visual		Pass	Section 4.3.1.1
Specific Gravity		1.0 max.	Section 4.3.1.2
Low Temperature Impact		-70 max	ASTM D 792
Brittleness	C	Pass	
Blocking (Cohesive @ 55° C)			4.3.1.7, ASTM D 746 4.3.1.8 ASTM D 1146
Adhesive Peel*	Pounds/inch width		Notes 1,2
Polyethylene to Polyethylene		25 minimum	
Neoprene to Neoprene		25 minimum	
PVC to PVC		15 minimum	
Polyethylene to Aluminum		25 minimum	Note 2B
CHEMICAL			
Water Absorption	Percent	1.0 maximum	Section 4.3.2.1 ASTM D 570
Corrosive Effect[1] 16 hours at 121° C *(250° F)*		Pass	Section 4.3.2.2 ASTM D 2671 Method B
Fungus Resistance		Rating of 1 or less	Section 4.3.2.5 ASTM G 21

[1]Use Thermofit RNF-100 to hold specimen in contact with mandrel.

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Solvent and Fluid Resistance			
Polyethylene to Polyethylene	pounds/inch width		
Peel Specimens			
24 hours at 23° C			
Followed by Adhesive Peel			Note 3
Hydraulic Fluid (MIL-H-5606)		20 minimum	
Hydraulic Fluid (MIL-H-46170)		20 minimum	
Lube Oil (Mil-L-7808)		20 minimum	
Lube Oil (Mil-L-23699)		20 minimum	
Cleaning Compound (PC 437)		20 minimum	
Lube Oil (VV-L-800)		20 minimum	
Anti-Icing Fluid (MIL-A-8243)		20 minimum	
5% Salt Water		20 minimum	
2 hours at 23° C			
Followed by Adhesive Peel			Note 3
Diesel Fuel #2		20 minimum	
JP-4 Fuel (MIL-T-5624)		20 minimum	
Decontamination Fluid DS-2		20 minimum	
ELECTRICAL			
Volume Resistivity	ohm-cm	10^{10} min	Section 4.3.3.1 ASTM D 257
Dielectric Strength	volts/mil	500 min	Section 4.3.3.2 ASTM D 149

Acceptance Tests: Visual, Peel (Aluminum)

NOTE 1 ADHESIVE PEEL SUBSTRATES

Material	Use
Polyethylene	Thermofit RNF-100
Neoprene	Thermofit NT
PVC	Thermofit PVC
Aluminum	2024-T3 or equivalent

NOTE 2 PEEL STRENGTH

A) Heat Shrinkable Tubing

Recover a 6-inch length of the specified heat shrinkable tubing on a glass-laminated plastic or a metal tube 1-inch in diameter. Apply heat with a Thermofit 500A Thermogun equipped with a TG 13 reflector and operating at 288-343°C *(550-650°F).* Cool the recovered tubing to room temperature. After cooling, lightly abrade the outside of the recovered tubing and the insides of three 1-1/2-inch lengths of the specified 1-1/2 inch diameter expanded tubing with No. 320 emery cloth. Wipe with a clean cloth or paper towel wet with methyl ethyl ketone. Spiral wrap the adhesive tape, with a 50% overlap to produce a double thickness of adhesive, over the recovered tubing. Place a strip of 3/4 inch wide masking tape lengthwise over the adhesive tape to hold it in place and to provide unbonded ends to insert into tensile tester. (Figure A).

Place three 1-1/2-inch lengths of the tubings, abraded on the inside, over the adhesive, as shown in Figure A, and recover as described above. Continue heating for 30 seconds after the tubing has recovered. Place the assembly in an oven for 10 minutes at 150+3°C *(302+5°F)* to assure uniform heating. Cool to room temperature, and cut along one edge of the masking tape to remove the bonded assembly from the mandrel (Figure B). Cut a specimen 1I inch wide (Figure C) from the center of each double thickness.

Insert the unbonded ends of each specimen in the jaws of a tensile tester operating at a jaw separation speed of 2 inches per minute. Make readings of peel strength at every 1/2 inch of jaw separation after 1 inch initial separation. The average of five readings shall define peel strength.

B) Heat Shrinkable Tubing to Aluminum

Abrade an 18-inch length of 1-inch diameter aluminum pipe (2024 T-3 or equivalent) with No. 320 emery cloth and wipe with a clean cloth or paper towel wet with methyl ethyl ketone. Spiral wrap the adhesive tape on the mandrel, with a 50% overlap to produce a double thickness of adhesive. Place a strip of 3/4-inch wide masking tape lengthwise over the adhesive to hold it in place and to provide unbonded ends to insert into tensile tester. (Figure D)

Abrade, clean, recover and oven-heat three 1-1/2-inch lengths of 1-1/2 inch diameter RNF-100 as described in Section A above. After cooling to room temperature, cut tubing into 1-inch wide sections (Figure D). Cut each specimen along the edge of the masking tape to free unbonded ends of the tubing.

Place the specimen in a tensile testing machine, with the specimen around the positioning mandrel and the free end of the specimen inserted into the tensile testing machine jaw (Figure E). Construct the holding fixture so that the yoke is free to rotate during testing. Test with a jaw-separation speed of 2 inches per minute. Take readings of peel strength at every 1/2 inch of jaw separation after 1I inch initial separation. The average of five readings shall define peel strength.

NOTE 3 FLUID RESISTANCE

Immerse three polyethylene adhesive peel specimens, prepared in accordance with Notes 1 and 2 in each of the test fluids for the specified time periods. After immersion, lightly wipe the specimens and air dry them for 30-60 minutes at room temperature. Test the specimens for adhesive peel in accordance with Note 2.

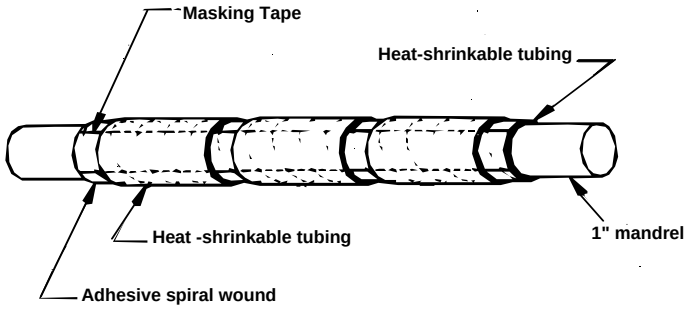


Figure A. Mandrel Assembly

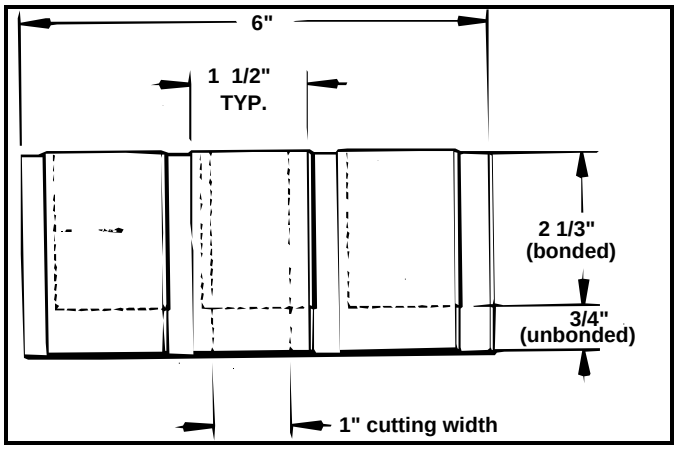


Figure B. Slab Specimen

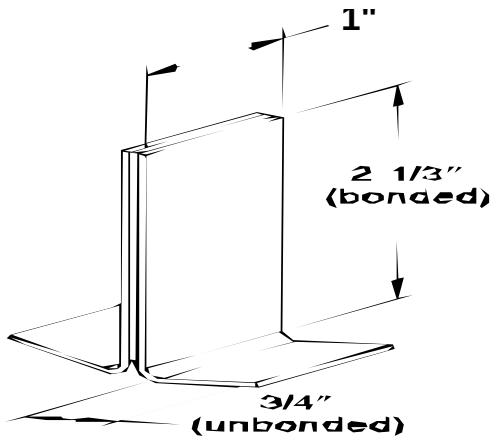


Figure C. Peel Strength Specimen

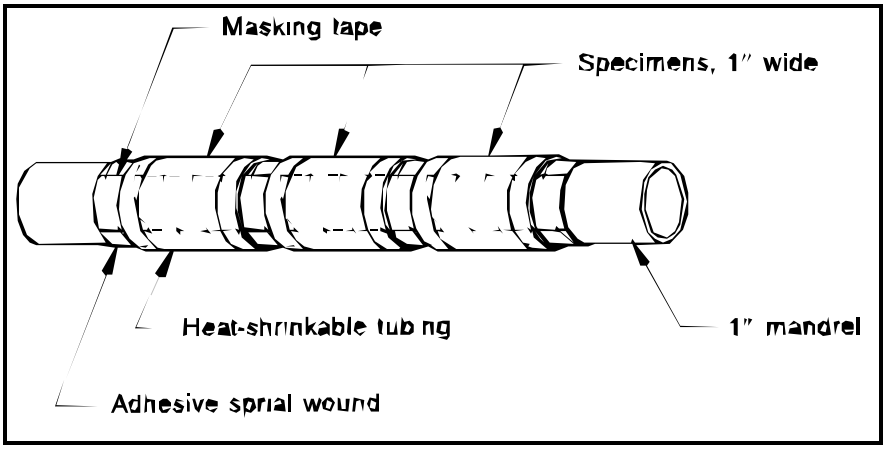


Figure D. Peel Specimen Preparation

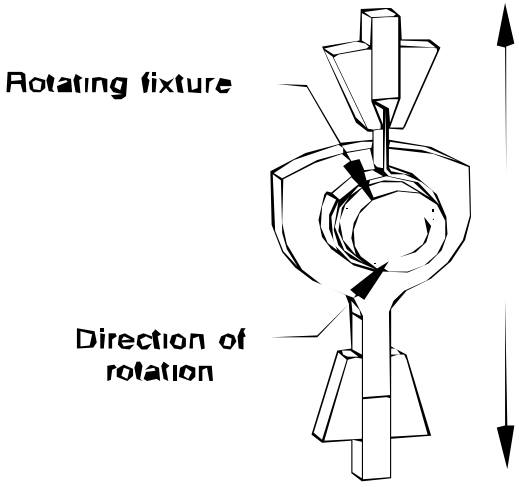


Figure E. Peel Specimen in Tensile Test

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