Call Letters	Appendix B
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1. SCOPE

1.1 This appendix describes equipment used in methods found in this standard. It includes a description of equipment used in more than one method, and a table referencing each test method and the appropriate equipment required to conduct the tests described in these methods.

2. TEST EQUIPMENT DESCRIPTION

2.1 This paragraph describes equipment required by more than one test method in this standard.

2.2 Adhesion testers

2.2.1 Adhesion peel tester or slip/peel tester

The testing machine will be of the constant rate of extension type composed of a device for fixing the sample in a configuration that facilitates the testing of samples in the 90° as well as the 180° position, and a clamp that falls in a position where the center of each device is in the same plane. The tester sample holders also will be oriented so that they will be parallel to the direction of stress, and so aligned so that they will hold the specimen wholly in the same plane. A stress gauge or load cell and recording device will be part of the sample-holding apparatus and will be capable of recording the force required. A means of moving the stress jaw at a uniform rate of 300 mm/min (12"/min.).

2.2.2 Adhesion/release tester

This equipment is the same as the above except the speed of the test can be adjusted to 300; 750; 1,500; 7,500; 15,000; and 30,000 mm/min (12, 30, 60, 300, 600 and 1,200"/min.) for the combination adhesion/release tester. The test bed stroke can be adjusted to as much as 400 mm (16").

2.2.3 Tensile tester as described below in paragraph 2.3

2.3 Tensile tester

2.3.1 The testing machine shall be of the constant rate of extension type composed of two clamps whose center shall be in the same plane, parallel with the direction of the motion of the stressing clamp, and so aligned that they will hold the specimen wholly in the same plane; a device for recording the tensile load and the amount of jaw separation; and a means of moving the stressing jaw at a uniform rate to be specified in the test method.

2.3.2 The tester should have a load range such that the test mean value falls between 20% and 80% of full scale.

2.3.3 In lieu of the clamping jaws, a pair of 102 mm (4") diameter cylinders shall be used when specified. These cylinders shall be constructed so that when they are attached to the tensile machine, the line of the tape during testing shall be parallel to the motion of the applied stress.

2.4 Cutter, specimen.

2.4.1 The specimen cutter shall hold two single-edged razor blades in parallel planes, a precise distance apart, to form a cutter of exact specimen widths. Two cutters, 12 mm (0.5") and 24 mm (1") cutting width, shall be available.

2.4.2 The 12 mm (0.5") cutter shall consist of a 12 mm (0.5") thick by 200 mm (8") length of aluminum barstock 12 mm (0.5") wide. The edges for about 125 mm (5") from one end shall be tapered slightly to form a handle. The width of the bar for 75 mm (3") from the opposite end shall be narrowed to exactly 12 mm (0.5") minus the thickness of a single razor blade (one of two used as cutting edges). The razor blades shall be held in position using side plates. The end of the cutter shall be cut away at a 45° angle to expose the cutting edge at one end of the blades. The edges shall be separated by 12 ± 0.1 mm (0.500 ± 0.005").

2.4.3 The 24 mm (1") cutter shall follow the same description as in 2.3.2, except that the barstock width shall be 24 mm (1") and shall be narrowed to exactly 24 mm (1") minus the thickness of a single razor blade.

2.5 Cup, water vapor transmission rate, and water penetration rate test.

2.5.1 The test cups shall be made from materials that are non-hygroscopic. The cup shall have a zero moisture vapor transmission rate (MVTR). The cups shall be rectangular with a flat, smooth, rigid flange, and shall have the following dimensions:

Flange: Outside 50 x 150 ± 0.5 mm (2.0 x 6.0 ± 0.02").
Inside (opening): 25 x 102 ± 0.5 mm (1.0 x 4.0 ± 0.02").

Body: Inside 25 x 102 x 37.5 (depth) ± 0.5 mm (1.0 x 4.0 x 1.5 (depth) ± 0.02").

The mass shall not exceed 80% of the balance capacity used in weighing.

2.6 Panel

2.6.1 A 50 x 125 x 1.2 mm (2 x 5 x 0.048") ± 10% panel of 304 stainless steel, free from burrs or sharp edges, having a bright annealed finish. The surface roughness shall be 0.5 ± 0.25 microns (2 ± 1 micro inches) (Ra). The deviation in flatness in both the machine and the cross direction of the bright annealed surface shall be 0.125 mm (0.005") maximum. The surface shall be free of contaminants such as process oils, and visual defects such as blemishes and scratches.

2.6.2 Panels with other shapes and dimensions may be formed or cut from the same steel and finish when specified by an individual method. The surface, directional flatness, and edges should still meet the requirements of 2.6.1. This paragraph will be cited with the necessary exceptions.

2.6.3 The bright annealed surface of any panels during storage or shipment should be covered with a residue free wrapper.

2.6.4 Panels showing or developing stains, discoloration, or scratches are not acceptable.

2.7 Roller, mechanically operated, rubber covered.

2.7.1 A steel roller, 81 ± 2.5 mm (3.25 ± 0.1") in diameter and 43.75 ± 1.25 mm (1.75 ± 0.05") in width, covered with rubber approximately 6.25 mm (0.25") in thickness and having a Shore scale A durometer hardness of 80 ± 5. The surface of the roller shall be a true cylinder void of any concave or convex deviations. The mass of the roller shall be 2 ± 0.5 kg (4.5 ± 0.1 lb_m).

2.7.1.1 A simple check to determine if the rubber surface is cylindrical is to wrap a very thin paper (onion skin) and roll it across a flat glass plate on which is placed carbon paper, face up. The carbon rubs off onto the thin paper to reveal high spots or hollows on the rubber surface.

2.7.1.2 For foil tapes only. A steel roller 125 ± 25 mm (5.0 ± 1") in diameter with a total weight of 4.5 ± 0.5 kg (10.0 ± 0.10 lb_m) may be used. The cylindrical surface of the roller shall be a true cylinder void of any concave or convex deviations so that the roller will apply a uniform pressure across the width of its entire surface.

2.7.2 A mechanically driven mount for the roller to move at either 300 or 600 ± 12 mm/minute (12 or 24 ± 0.5"/minute) in one direction and return at the same speed in the opposite. The mount shall support the roller so that, during rolling, the full weight of the roller (but only the weight of the roller) shall be allowed to act on the specimen. The roller shall be free to rotate on its own axis. The mount shall provide a means of lifting the roller so that, at rest the roller surface does not contact any object.

2.8 Roller, hand operated, rubber covered.

2.8.1 Roller as in 2.7.1

2.8.1.1 Roller as in 2.7.1.2

2.8.2 The roller construction shall not allow the weight of the handle to increase the weight of the roller during use.

2.9 Tear tester

2.9.1 The apparatus shall be an Elmendorf-type of tester conforming to the following:

2.9.2 A stationary clamp and a movable clamp carried on a pendulum preferably formed by a sector of a wheel or circle, free to swing on a balance or other substantially frictionless bearings;

2.9.3 A pointer and pointer stop to record the maximum arc of swing of the sector pendulum;

2.9.4 A sector release to hold the pendulum in the raised position during the mounting of the sample, and permitting it to follow through the force of gravity;

2.9.5 Pendulum carrying a circumferential graduated scale, so as to indicate the force used in tearing the specimen;

2.9.6 A knife attachment for initial slitting of the specimen.

2.9.7 With the pendulum in the raised position, the movable clamp shall lie in the same plane as the fixed clamp forming as it were an extension to the fixed clamp. This plane shall be perpendicular to the plane of oscillation of the pendulum. The gripping surface of the jaws in each clamp shall be 25 mm (1.0") by 16.5 mm (0.65"). The clamps shall be separated by a distance of 2.5 mm (0.1"). The knife attachment shall slit this specimen midway between the clamps at right angles to the upper edge of the clamps. The slit shall extend from the bottom edge of the specimen to a point of 4 mm (0.16") above the top edge of the clamps leaving a distance of 43 mm (1.72") of uncut specimen perpendicular to the long dimension of the specimen. The perpendicular from the line formed by the top edge of the clamps to the axis of suspension shall be 104 mm (4.2") and shall make an angle of 27.5° with the plane of the specimen.

3. EQUIPMENT

3.1 Possible sources of test equipment are:

ChemInstruments, 510 Commercial Drive, Fairfield, Ohio 45014. Telephone: (877) 752-4155

Paul L. Gardner Company, Inc., 316 N.E. First Street, P.O. Box 10688, Pompano Beach, FL 33061-6688. Telephone: (954) 946-9454

IMASS Inc., P.O. Box 134, Accord, MA 02018-0134. Telephone: (617) 482-8090

SATEC Materials Testing Equipment, 900 Liberty Street, Grove City, PA 16127-0903. Telephone: (412) 458-9610

Testing Machines, Inc. 2 Fleetwood Court, Ronkonkoma, NY 11779. Telephone: (631) 439-5400

TABLE I - Method with Equipment Reference

Method	Equipment
PSTC-101	Cutter, specimen
	Panel
	Roller, rubber covered, mechanically operated
	Adhesion tester / Tensile tester with 90° fixture
PSTC-5	Cutter, specimen
	Panel
	Quick stick test fixture
	Tensile tester
PSTC-6	Rolling ball tack tester
	Steel ball 11 mm (7/16") diameter
PSTC-107	Holding power test stand - room temperature version
	Holding power test stand - oven temperature version
	Holding power cut-off fixture
	Panel
	Roller, rubber covered, hand or mechanically operated
	Specimen tester
PSTC-8	Fixture with free-turning mandrel
	Tensile tester
PSTC-9	Vessel forced-convection oven, ammonium sulfate, distilled water
PSTC-11	Roller, rubber covered, hand operated
	Nonrotating metal cylinder
	Oven, circulating (65.5 °C [150 °F]), Cold Chamber (-18.3 °C [-1 °F])
PSTC-13	Variable speed unwind machine
PSTC-14	Panel
	Stop watch
	Cutter, specimen
	Punch, paper, single hole
	Holding power test stands, horizontal
	Roller, rubber-covered per Appendix B
PSTC-15	Coating apparatus (50 microns [2 mil] dry thickness capable)
	Vented drying chamber
	Circulating oven
	Tensile Tester with 90° fixture or Release Testing Machine
	Panels,
	Roller per Appendix B
PSTC-16	Cutter, specimen
	Panel
	Test fixture
	Tensile tester
	Loop Tack Tester
PSTC-21	Roller, rubber covered, hand operated
	Ultraviolet light source (RS Lamp)
	102 x 102 mm (4 x 4") test panels
	Paint spray equipment
	Convection oven
PSTC-22	Roller, rubber covered, hand operated
	102 x 102 mm (4 x 4") test panels
	Paint spray equipment
PSTC-131	Cutter, specimen
	Tensile tester with pneumatic clamps or 102 mm (4") diameter cylinders
PSTC-133	Thickness gauge or micrometer as specified
PSTC-34	Cup, water vapor transmission rate
	Humidity chamber maintained at 37.8 ± 2°C (100 ± 3.6°F)
	and 90% to 95% RH
	Balance, analytical

PSTC-35	Cup, water penetration rate Container for water at least 102 mm (4") deep
PSTC-38	Balance, analytical Elmendorf tear tester
PSTC-50	Tensile tester, die Cutter, specimen Tensile tester
PSTC-51	Dielectric Strength Tester per ASTM D 149
PSTC-53	Holding power test stands Cutter, specimen Roller, rubber covered, hand operated Weight, 500 g (1.1 lbm)
PSTC-54	Tape winding fixture (see ASTM D 1000) Weight, 500 g (1.1 lbm) Air-circulating Oven (130°C)
PSTC-55	Panel Roller, rubber covered, hand operated
PSTC-56	Penetration tester per Figure 1, ASTM D 876 Oven with 1°C / 2 minute increase rate
PSTC-57	Brass rods Winding fixture Weights Bunsen burner Stop watch Stands and clamps Level Enclosure Gas supply
PSTC-171	Ruler (Metric or English)

Individual methods may require different test weights.
Refer to Section 4 of the different methods.

TABLE 2 - Equipment Sources

TYPE	PSTC	DESCRIPTION	OTHER TEST METHODS				CHEM INSTRUMENTS	CHEM INSTRUMENTS	IMASS	TMI	THWING ALBERT	TINIUS OLSEN
	TEST NO.		TLMI	ASTM	AFERA	FINAT	EQUIPMENT	ACCESSORIES				
Peel & Release	101(A-F) 4B	90 & 180 deg Peel/Release	L-IA1 L-IA2 L-IA3	D3330 (A - F) D5375 (A,B) D6252	4001 P11	1, 2, 3, 5, 10, 11	AR-1500 or AR-1000 TT-1000	RD-3000 HR-100 TP-26 SC-012 / 024	SP-2000 SP-2200 SP-101B	80-15-00 80-90-01		Yes
	55	Oil Resistance					SO-8 AR-1000/1500 TT-1000	TP-26 HR-100				
	15	Wet Spread					LC-100 SOS-8 AR-1000/1500 or TT-1000	PF-90 HR-100 TP-26				
High-speed Release		Unwind Force of Liner at High Speed	L-1A3			4	HSR-1000	NA	ZPE-1100W			
Tack	16	Loop Tack	LT	D6195 (A)		9	LT-500 or LT-1000 or TT-1000	TP-13 TP-16 SC-100 LTF-100				
		Probe Tack		D2979			PT-500 or PT-1000	NA		80-02-01		
	6	Rolling Ball		D3121			TT-100	NA				
	5	Quick Stick			4015		TT-1000	PF-90	Yes	Yes	Yes	
Shear	107 (A-F), 14	Shear at ambient temperature	7	D6463 (B) D3654 (A)	4012	8	RT-10 or RT-30	HR-100 TP-23 SC-012 SC-024 TW-500 & 1000				
		Dynamic				18				Yes	Yes	Yes
Heated Shear Aging	53 107 (G)	Shear at elevated temperatures	SHR	D6463 (A) D4498			HT-8 or HT-30 & SO-8					
	50	Shear after Solvent immersion					TT-1000 SO-8	HR-100				
Thickness	33	Thickness Measurement	T-411	D3652 D645 D374	4006		MI-1000	NA		49-60-01 49-70-01	89-100	
Unwind	8, 13	High Speed Unwind Force		D1000	4008		HSU-1000	NA				
	8	Unwind Force			4013		TT-1000	UWF-100	SPA2-09			

TYPE	PSTC TEST NO.	DESCRIPTION	OTHER TEST METHODS				CHEM INSTRUMENTS EQUIPMENT	CHEM INSTRUMENTS ACCESSORIES	IMASS	TMI	THWING ALBERT	TINIUS OLSEN
			TLMI	ASTM	AFERA	FINAT						
Tensile	31, 39	Tensile Strength of Material	L-1A1 II-E III-A T494 om 96	D828 D903 D3330 D882 1004 D3759	4004		TT-1000	SC-100		84-31-01	Yes	
		Elongation			4005							
Burst		Burst Strength of Perforated Material	Burst DC1				BP-1000	NA				
		Penetration								13-09-04	Yes	
Aging & Drying	9,11				4026		SOS-8	NA				
Water Vapor Transmission	34				4002		WV-100	NA				
Stain Test	21,22						SO-8	HR-100				
Water Penetration	35						SO-8	NA			Yes	
Tear	38	Tear Resistance	T-4141 om-98							Elmendorf 83-10-00	Yes	
Dielectric Breakdown	51	Hipotronics, Inc.										
Blocking	54											
Penetration	56											
Flammability	57				4009							
Cold			Yes	D1894-99 D4518-91					Yes	Yes	Yes	
Contact Angle			Yes	D724-99								

Equipment supplier websites:

Cheminstruments Inc.: www.cheminstruments.com
Hipotronics, Inc.: www.hipotronics.com
IMASS: www.imass.com
TMI: www.testingmachines.com
Thwing Albert: www.thwingalbert.com
Tinius Olsen: www.tiniusolsen.com