

TABLE 1
CHEMICAL FABRICS & FILM ASSOCIATION
Recommended Minimum Performance Standard for Vinyl Swimming Pool Liners -
In-Ground

CFFA-P-101C
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PROPERTY	TEST METHOD	VALUE
THICKNESS, mils, +/-5%	ASTM D1593	Nominal
SPECIFIC GRAVITY (range)	ASTM D792	1.23 - 1.29*
TENSILE STRENGTH (psi, min.)	ASTM D882	MD 2300 TD 2000
MODULUS @ 100% ELONGATION (psi, min.)	ASTM D882	MD 950 TD 950
ELONGATION @ BREAK (% , min.)	ASTM D882	MD 300 TD 300
DIMENSIONAL STABILITY (% change max., 212°F for 15 min. or 158°F for 30 min.)	ASTM D1204	MD -4.0
SNAP BACK (% , max.)	CFFA - 240	-2.0
TEAR RESISTANCE (lbs./in, min.)	ASTM D1004	MD 220 TD 220
VOLATILITY (% weight loss, max.)	ASTM D1203	1.5
WATER EXTRACTION (% weight loss, max., 24 hrs @ 70°C)	ASTM D1239	0.35
LOW TEMPERATURE IMPACT (Pass, degrees F, +/-2°)	ASTM D1790	-20
FUNGAL RESISTANCE	ASTM G21 ASTM E 1428	No Growth No Stain
WEATHERING ** Xenon QUV	SAE J1885 ASTM G53	200 Hours for Minimal Color Change 1500 Hours for Minimal Polymer Degradation
PRINT ABRASION RESISTANCE: *** Taber Method Topcoated film, CS 17 wheels, 500 g weight ***	ASTM D4158	300 cycles
Wyzenbeek Method **** (3 lbs. pressure, 4 lbs. tension)	ASTM D4157	2000 cycles
LAYFLAT (Belly or Baggy Center)	CFFA-	-0%, +1.8%
Taper or Racetracking	CFFA-	+1.8%

*Specific gravity may vary with color.

**Either method may be used. Exposure test for 1500 hours on material should show minimal color fading of base film by visual inspection.

***Either method may be used.

****Abrasion test should show minimal wear.

Recommended Minimum Performance Standards for
VINYL SWIMMING POOL LINERS - IN-GROUND

Developed by



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1. Scope

- 1.1 This document sets forth recommended minimum performance standards for vinyl and other polymeric films, plain and printed, which are used as in-ground swimming pool liners.
- 1.2 This specification is not applicable to vinyl or polymeric films used in other applications.

2. Applicable Documents

For applicable documents used in this specification, refer to the ASTM or CFFA.

3. Definitions

Abrasion - Measurement of the ability of the chemical coating to resist surface wear when rubbed against another (abradent) surface.

Elongation @ Break - A measurement of the percent elongation from the original sample at the moment when the material breaks during a tensile test.

Fungal & Bacterial Resistance - A determination of the ability of a polymeric film to resist fungal growth.

Low Temperature Resistance - The measurement of the ability of a polymeric film to withstand cracking at low temperatures.

Modulus @ 100% Elongation - A measurement of the stiffness of the vinyl film measured by recording the load at 100% elongation.

Tear Strength - A measurement of the force required to continue or propagate a tear in a polymeric film.

Tensile Strength - A measurement of the force required to break a polymeric film.

Volatility - An accelerated measurement of weight loss of a polymeric film when subjected to an elevated temperature in activated carbon.

Water Extraction - A measurement to determine the level of water soluble components of a polymeric film.

Weathering - An artificial accelerated test to predict the weathering characteristics of a polymeric film.

4. Performance Requirements

- 4.1 Vinyl and other polymeric films are manufactured from natural and/or synthetic fibers chemically coated on one side to provide a durable, protective surface. Depending upon application, the polymeric films will be colored, decorated and/or textured to provide an aesthetically pleasing appearance and feel while maintaining minimum performance standards under non-abusive consumer usage.
- 4.2 Properties described in Table 1 for polymeric films collectively make up the minimum performance standards. Properties are measured using CFFA and/or ASTM Standard Test Methods. Test methods outlined in the CFFA Standard Test Methods pamphlet describe their purpose and relate the properties tested to various aspects of performance.
- 4.3 The test results for polymeric films, when tested in accordance with the CFFA Standard Test Methods, must attain the minimum values of all properties listed in Table 1 for a given construction in order to conform to this standard.

5. Test Procedures - All test methods are run to ASTM or CFFA Standard Test Methods.