



February 9, 2015

3M INTERNAL TEST REPORT SUMMARY
3M WINDOW FILMS, RENEWABLE ENERGY DIVISION
SAINT PAUL, MN 55144

TEST: **Tensile Strength**

REFERENCES: ASTM D882-09, *Standard Test Method for Tensile Properties of Thin Plastic Sheeting*
3M TM-209

TEST SPECIMEN: 3M™ Safety and Security Window Film, S70 Exterior
Lot: 325632401566-009-A

TEST APPARATUS: MTS Criterion™, Model 43 Tensile Tester

SETTINGS: Initial Crosshead Speed = 12 in/min
Secondary Crosshead Speed = 2 in/min
Sample width = 1 inch
Sample Gauge Length = 4 inches
Load Cell Rating: 2,200 lbs

OVERVIEW:

This report summarizes the measured tensile properties of 3M™ Safety and Security Window Film, S70 Exterior. Prior to each test, the adhesive liner was removed.

RESULTS:

Specimen Comment	Width	Thickness	Peak Load	Peak Stress	Modulus	Peak Strain	Yield Load	Yield Strain	Yield Stress	Break Load	Break Stress	Break Strain
	in	in	lbf	psi	psi	%	lbf	%	psi	lbf	psi	%
S70X - MD	1.0	0.0	159.6	22,780	513,000	174.3	112.5	6.2	16,060	159.6	22,780	174.3
S70X - TD	1.0	0.0	196.8	28,120	583,600	133.7	197.0	134.4	28,150	196.8	28,120	133.7
Average (MD/TD) - nominal	1.0	0.0	178.2	25,450	548,300	154.0	154.7	70.3	22,105	178.2	25,450	154.0

RESULTS (cont'd):

Figure 1. Tensile Curves for Safety S70 Exterior (MD).

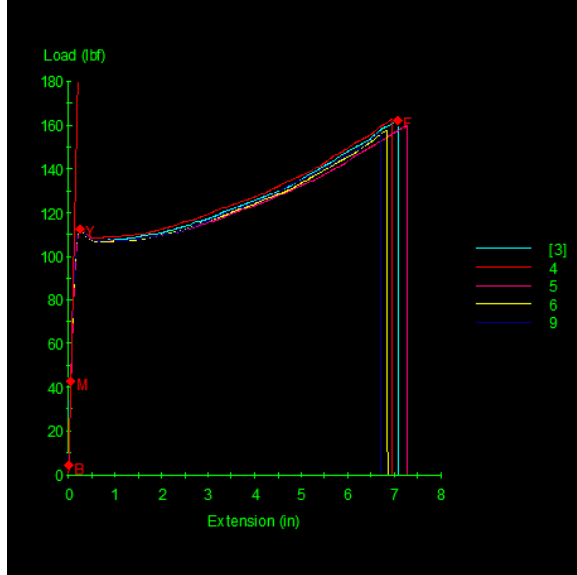
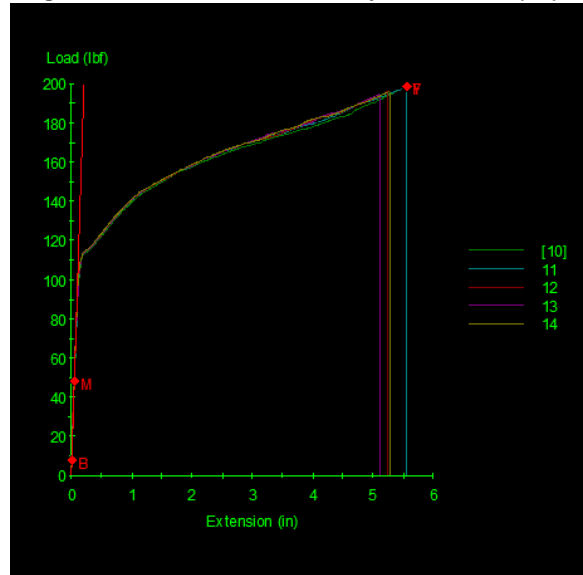


Figure 2. Tensile Curves for Safety S70 Exterior (TD).



Specimen Comment	Width	Thickness	Peak Load	Peak Stress	Modulus	Peak Strain	Yield Load	Yield Strain	Yield Stress	Break Load	Break Stress	Break Strain
	in	in	lbf	psi	psi	%	lbf	%	psi	lbf	psi	%
S70X - MD [3]	1.0	0.007	161.9	23,100	495,000	177.2	112.5	6.2	16,100	161.9	23,100	177.2
S70X - MD [4]	1.0	0.007	162.6	23,200	498,000	173.7	113.0	6.2	16,100	162.6	23,200	173.7
S70X - MD [5]	1.0	0.007	159.8	22,800	529,000	181.8	112.1	6.4	16,000	159.8	22,800	181.8
S70X - MD [6]	1.0	0.007	157.6	22,500	505,000	171.2	112.2	6.0	16,000	157.6	22,500	171.2
S70X - MD [9]	1.0	0.007	156.2	22,300	538,000	167.6	112.5	6.1	16,100	156.2	22,300	167.6
S70X - TD [10]	1.0	0.007	198.8	28,400	552,000	139.0	198.8	139.0	28,400	198.8	28,400	139
S70X - TD [11]	1.0	0.007	198.8	28,400	551,000	139.0	198.8	139.0	28,400	198.8	28,400	139
S70X - TD [12]	1.0	0.007	195.7	28,000	611,000	130.9	****	****	****	195.7	28,000	130.9
S70X - TD [13]	1.0	0.007	194.6	27,800	594,000	127.6	194.6	127.6	27,800	194.6	27,800	127.6
S70X - TD [14]	1.0	0.007	195.9	28,000	610,000	131.8	195.9	131.8	28,000	195.9	28,000	131.8

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