



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 (SH7CLARL)  
Lot: 211H6171 T

TEST APPARATUS: MTS Criterion™, Model 43 Tensile Tester

SETTINGS: Crosshead Speed = 10 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 (SH7CLARL). 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	%
S70 - MD	1	0.007	155.6	22,220	509,600	163.4	113.8	6.8	16,260	154.5	22,060	164.2
S70 - TD	1	0.007	194.0	27,720	598,600	122.8	195.1	127.4	27,900	194.0	27,720	122.8
Average (MD / TD) - nominal	1	0.007	174.8	24,970	554,100	143.1	154.5	67.1	22,080	174.3	24,890	143.5

RESULTS (cont'd):

Figure 1. Tensile Curves for Safety S70 (TD).

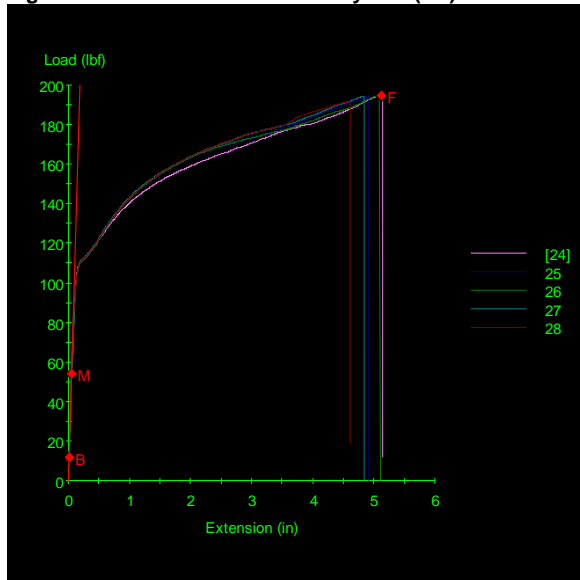
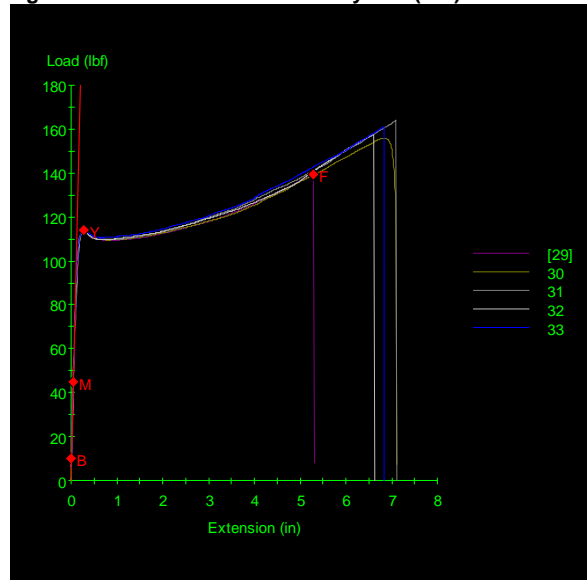


Figure 2. Tensile Curves for Safety S70 (MD).



Specimen Comment	Width in	Thickness in	Peak Load lbf	Peak Stress psi	Modulus psi	Peak Strain %	Yield Load lbf	Yield Strain %	Yield Stress psi	Break Load lbf	Break Stress psi	Break Strain %
S70 MD [29]	1	0.007	139.2	19900	500000	132.5	113.8	6.8	16300	139.2	19900	132.5
S70 MD [30]	1	0.007	155.8	22300	498000	170.9	113.6	7.1	16200	150.7	21500	175.1
S70 MD [31]	1	0.007	164	23400	505000	177.4	113.5	6.7	16200	164	23400	177.4
S70 MD [32]	1	0.007	157.7	22500	519000	165.5	113.9	6.7	16300	157.7	22500	165.5
S70 MD [33]	1	0.007	161.1	23000	526000	170.6	114.4	6.6	16300	161.1	23000	170.6
S70 TD [24]	1	0.007	194.9	27800	607000	128.3	****	****	****	194.9	27800	128.3
S70 TD [25]	1	0.007	194.4	27800	615000	122.9	****	****	****	194.4	27800	122.9
S70 TD [26]	1	0.007	195.1	27900	588000	127.4	195.1	127.4	27900	195.1	27900	127.4
S70 TD [27]	1	0.007	194.2	27700	595000	120.7	****	****	****	194.2	27700	120.7
S70 TD [28]	1	0.007	191.6	27400	588000	114.9	****	****	****	191.6	27400	114.9

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