



ELTEK
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Final Report

2/15/2019

ASTM D120 Rubber Insulating Gloves
ASTM D412 Standard Test Methods for Vulcanized Rubber and
Thermoplastic Elastomers - Tension
Area Swell Measurements

ELTEK Labs Project #: 190110-1-CW

SUBMITTED TO

R and R Lotion

15547 North 77th Street
Scottsdale, AZ 85260

Attention: R. Fletcher Rich

ELTEK International Labs

**Test Data Sheet - Insect Spray Repellent Formula 0280-1 in contact with rubber lineman's gloves (Type 1, Class 2, ANSI/ASTM D120)
 To determine if any significant changes occur in the tested properties of the gloves.**

ELTEK Project #: 190110-1-CW Technician Name: Turner, Jessie Technician Signature: Jessie Turner

Company: R and R Lotion Designation: Insect Repellent Formula 0280-1
 Contact: R. Fletcher Rich
 Address: 15547 North 77th Street
Scottsdale, AZ 85260

Room conditions during test: 23 ± 2 °C and 50 ± 5 % R. H.

PROCEDURE

Tensile Properties

The outer-surface of the glove was sprayed with a liberal amount of insect repellent, wiped off, allowed to stand thusly for 4 hours and then washed with mild soap and warm water. The above procedure was repeated once a day for 3 days. On the fourth day, samples were cut from the cuff areas of the gloves and tested as reported.

Area Swell

Test samples were measured after a 24-hour soak at 75°F in the insect repellent.

AC Electrical Proof Tests

Glove samples exposed to the insect repellent as per tensile property samples but were not cut up. Test was performed at 20 KV @ 3 minutes, maximum proof test current was recorded during the last 20 seconds of the test. Pass/Fail criteria is based on a maximum proof test current of 18 mA as dictated by the Class 2 and 16" glove length. Clearance from cuff to water line was set at 3 inches. Test was repeated after 16 hour soak in distilled water.

RESULTS

Tensile Properties (ASTM D412, Avg. of 5)

Table 1 Tensile Strength, psi

Specimen Number	Control	Candidate 3 Day Exposure	Percent Change From Initial	Control After 7 Day Aging at 158°F	Control Percent Change From Initial	Candidate 3 Day Exposure Followed by 7 Day Aging at 158°F	Candidate Percent Change From Initial
1	1164 lbs.	1125 lbs.	3% ↓	999 lbs.	18% ↓	1003 lbs.	14% ↓
2	1476 lbs.	1123 lbs.	24% ↓	1007 lbs.	32% ↓	1010 lbs.	32% ↓
3	1340 lbs.	1299 lbs.	3% ↓	1400 lbs.	4% ↑	974 lbs.	27% ↓
4	1696 lbs.	1283 lbs.	24% ↓	1027 lbs.	39% ↓	1044 lbs.	48% ↓
5	1513 lbs.	1226 lbs.	19% ↓	1044 lbs.	31% ↓	906 lbs.	40% ↓

Table 2 Ultimate Elongation %

Specimen Number	Control	Candidate 3 Day Exposure	Percent Change From Initial	Control After 7 Day Aging at 158°F	Control Percent Change From Initial	Candidate 3 Day Exposure Followed by 7 Day Aging at 158°F	Candidate Percent Change From Initial
1	5 lbs.	7 lbs.	40% ↑	6 lbs.	20% ↑	7 lbs.	40% ↑
2	6 lbs.	7 lbs.	17% ↑	7 lbs.	17% ↑	7 lbs.	17% ↑
3	8 lbs.	8 lbs.	0%	7 lbs.	22% ↓	7 lbs.	88% ↓
4	6 lbs.	7 lbs.	17% ↑	7 lbs.	17% ↑	8 lbs.	33% ↑
5	6 lbs.	7 lbs.	17% ↑	7 lbs.	17% ↑	8 lbs.	33% ↑

Table 3 500 % Modulus, psi

Specimen Number	Control	Candidate 3 Day Exposure	Percent Change From Initial	Control After 7 Day Aging at 158°F	Control Percent Change From Initial	Candidate 3 Day Exposure Followed by 7 Day Aging at 158°F	Candidate Percent Change From Initial
1	184 lbs.	114 lbs.	38% ↓	121 lbs.	34% ↓	93 lbs.	49% ↓
2	136 lbs.	119 lbs.	12% ↓	112 lbs.	18% ↓	98 lbs.	28% ↓
3	142 lbs.	108 lbs.	24% ↓	129 lbs.	9% ↓	70 lbs.	51% ↓
4	193 lbs.	114 lbs.	41% ↓	86 lbs.	55% ↓	70 lbs.	64% ↓
5	138 lbs.	104 lbs.	25% ↓	129 lbs.	7% ↓	63 lbs.	54% ↓

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ELTEK Project #: 190110-1-CW Technician Name: Turner, Jessie Technician Signature: Jessie Turner

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Area Swell, % (Avg. of 3)

Table 4 Percent Change From Initial

Specimen Number	Initial Weight (g)	Weight After a 24 Hour Soak in Repellent (g)	Initial Thickness (mm)	Thickness After a 24 Hour Soak in Repellent (mm)
1	1.5985	1.7476	1.883	1.841
2	1.4439	1.5699	1.836	1.799
3	1.7116	1.8741	1.806	1.772
Average	1.585	1.731	1.842	1.804
	Percent Change	6%↑	Percent Change	0%

AC Electrical Proof Test (ASTM D120)

Table 5 AC Proof Tests	Glove 1	Glove 2
Initial		
Leakage Current at 20 kV, mA	13.90	13.90
Pass/Fail Proof Test 20 kV	Pass	Pass
Breakdown Voltage kV	32.7	32.9
3 Day Insect Repellent Exposure		
Leakage Current at 20 kV, mA	14.21	14.21
Pass/Fail	Pass	Pass
Breakdown Voltage kV	31.1	33.3
16 Hour Distilled Water Soak		
Leakage Current at 20 kV, mA	15.16	14.99
Pass/Fail Proof Test 20 kV	Pass	Pass
Breakdown Voltage kV	30.6	30.8
3 Day Insect Repellent Exposure Followed by 16 Day Distilled Water Soak		
Leakage Current at 20 kV, mA	14.21	14.21
Pass/Fail Proof Test 20 kV	Pass	Pass
Breakdown Voltage kV	33.6	32.7

Notes: ↑ or ↓ equals the direction of the percentage of change observed from the control to the candidate after exposures.

ELTEK International Labs
Project Test Equipment Record Sheet

ELTEK Labs Project: # 190110-1-CW

Technician: Turner, Jessie

Technician Signature: Jessie Turner

Company: R and R Lotion

Contact: R. Fletcher Rich

Address: 15547 North 77th Street
 Scottsdale, AZ 85260

Number	ELTEK Equipment Name	Manufacturer's Information			Function	Range	Last Calibration	Next Calibration
		Name	Model	Serial No.				
562	Phenix High Voltage Tester	Phenix Technologies	6TC150-30	99-500	AC Proof and Breakdown Strength Tests	Range 1: 150.00 kV & 200.00 mA; Range 2: 15.00 kV & 2.00 A; Time: 0000:00:00 to 9999:59:59	4/4/2018	4/4/2019
600	Micrometer	Mitutoyo	293-761-30	1067963	Precise measurements of thickness.	0-1inch	2/26/2018	2/26/2019
61	Oven 838-A-	Fisher Scientific	838F	114	Aging test specimens - samples	30°C - 280°C	11/14/2018	11/14/2019
661	Insight 30kN Test System	MTS Systems Corporation	569329-05	260394	Tensile strength, compressive strength, flexural strength	Force: 0 to 6500 lbf; Length: 0 to 10 in; Speed: 0 to 20 in/min	4/9/2018	4/9/2019
692	Digital Analytical Balance	Denver Instrument	SI-234	24650423	Weight Measurements	0-230g	6/14/2018	6/14/2019
182	Temperature & Humidity Wi-Fi Data Logger	Lascar Electronics	EL-WiFi-TH	98:8B:AD:20:7E:45	Monitoring Lab Conditions	Temperature [-20°C to 60°C]; Relative Humidity [0 to 100 %RH]	6/26/2018	6/26/2020

Note: Calibration dates listed reflect the most recent calibration interval. All equipment listed was verified to be within a current calibration interval prior to initiation of testing. Previous calibration records are available on request.



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This report contains the data obtained by the test performed. These are the actual results for the test which ELTEK International Laboratories conducted for:

R and R Lotion Project #: 190110-1-CW

The test results are accurate for the specimens tested. These specific values may not be duplicated in all cases.

Report Submitted By:

Reviewed By:

Laboratory Technician

Date: 2/15/2019

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