

July 19, 2019

## ▪TEST REPORT▪

**PN 147195E**  
*PO wire transfer*

### PHYSICAL TESTING DEPARTMENT

Prepared For:

Norwahida Yusof  
GB Industries SDN BHD  
Lot 3850-3855, Chembong Phase II  
Ind. Estate Chembong  
Chembong Rembau N. Sembilan 71300 MAL

Prepared By:

*Sandy Jones-Hamrick*  
Sandy Jones-Hamrick  
Project Technician

Approved By:

*Melissa Martin*  
Melissa Martin  
Physical Testing Manager

Rev 101218



An A2LA ISO 17025 Accredited Testing Laboratory — Certificate Numbers 255.01 & 255.02  
ISO 9001:2015 Registered

**ISO 9001:2015**  
Registered

Letters and reports are for the exclusive use of the clients to whom they are addressed and shall not be reproduced, except in full, without the written permission of Akron Rubber Development Laboratory, Inc. (ARDL). The information contained herein applies to the specific material, products or processes tested or evaluated. No warranty of any kind is herein construed or implied. The liability of ARDL, Inc. shall be limited to the amount of consideration paid for services. ARDL, Inc. is ISO 17025 accredited by A2LA for the test methods listed on the referenced certificates.

July 19, 2019  
Norwahida Yusof  
GB Industries SDN BHD

Page 2 of 5  
PN 147195E

**SUBJECT:** Physical Testing on material submitted by the above company to ASTM D 120 Class 3 test specification.

**RECEIVED:** Eight (8) NOVAX rubber insulating gloves identified as Class 3

**DIMENSIONS, PARA. 17.1 - 17.3.1<sup>A</sup>**

Three gloves tested.  
Average of four readings reported.

**REQUIREMENTS:** Thickness Crotch, mm = 1.52 – 2.92  
Thickness Palm & Back, mm = 1.90 – 2.92

	<u>LENGTH, mm</u>	<u>WIDTH, mm</u>	<u>PALM, mm</u>	<u>CROTCH, mm</u>	<u>BACK, mm</u>
Glove 1	415	136	3.05	3.02	2.89
Glove 2	416	136	3.02	2.96	2.83

**ORIGINAL PHYSICAL PROPERTIES, ASTM D 412, D 2240**

Die C dumbbells tested at 20 in/min.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Durometer A, points	38	47 max.	Pass
Tensile Strength, MPa	21.7	17.2 min.	Pass
Ultimate Elongation, %	715	600 min.	Pass
200% Modulus, MPa	0.86	2.1 max.	Pass
Tension Set @ 400%, %	2.1	25 max.	Pass

**TEAR RESISTANCE, ASTM D 624, DIE C**

Specimens tested at 20 in/min.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Tear Strength, kN/m	33.1	21 min.	Pass

\*ARDL is ISO 17025 accredited by A2LA for the test methods listed on the certificates referenced on page one. Unless specified, the current specification version is used.

**NOTE:** Non-ISO 17025 accredited test methods are designated with the <sup>A</sup> symbol to differentiate from ISO 17025 accredited methods in the body of the test report.\*

www.ardl.com | 2887 Gilchrist Rd. | Akron, Ohio 44305 | answers@ardl.com | Toll Free (800) 830-ARDL  
Fax (330) 794-6610 | Worldwide (330) 794-6600

#### **PUNCTURE RESISTANCE, ASTM D 120**

Palm area punctured at 20 in/min.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Puncture Resistance, kN/m	72.3	18 min.	Pass

#### **HEAT-AGED PROPERTIES, ASTM D 573**

Specimens aged 168 hrs. @ 70°C in a forced air oven.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Tensile Strength, % of original	117.9	80 min	Pass
Elongation, % of original	94.8	80 min.	Pass

#### **A-C PROOF, ASTM D 120, PARA 18.4.2**

Preconditioning: See below.

Test Procedure: Each glove shall be submitted to a proof voltage test as specified in Table 2. The A.C. voltage shall be initially applied at a low voltage value and gradually increased at a constant rate-of-rise of approximately 1000 V/s until the specified test voltage level is reached or failure occurs. The current is measured during the test period, either continuously or at end of the period. The test voltage shall be reduced at the same rate. The test period shall be equal to 3 min, considered to start at the instant the specified proof voltage is reached. Unless an electrical failure occurred during the period test, the applied voltage should be reduced at least to half value before opening the test circuit. The glove was filled with tap water and immersed in water to the specified depth. A metal rod was lowered inside the glove as one electrode and a metal rod placed in the water tank outside the glove as the other electrode. A voltage was applied to the electrodes at an increasing rate of 1000 V/s until specified voltage for each class of glove was reached. The specified voltage was applied for a period of 3 minutes after which the voltage was lowered to 0 V.

#### **REQUIREMENTS:**

Class	Glove Length (mm)	Exposed Cuff Length (mm)	Test Voltage (VAC)	Maximum Current (mA)
3	410	89	30,000	22

#### **RESULTS:**

Preconditioning: Gloves were preconditioned as follows:

Sample	Pre-Conditioning	Measured Current (mA)	Pass/Fail
Class 3 (1)	None	10	Pass

\*ARDL is ISO 17025 accredited by A2LA for the test methods listed on the certificates referenced on page one. Unless specified, the current specification version is used.

NOTE: Non-ISO 17025 accredited test methods are designated with the ^ symbol to differentiate from ISO 17025 accredited methods in the body of the test report.\*

**A-C MOISTURE ABSORPTION/PROOF, ASTM D 120, PARA 18.4.4**

The A.C. voltage shall be applied as specified in 5.6.1.4.2 until the specified withstand voltage is reached in accordance to Table 6, then reduced.

**REQUIREMENTS:**

Class	Glove Length (mm)	Exposed Cuff Length (mm)	Test Voltage (VAC)	Maximum Current (mA)
3	410	89	30,000	22

**RESULTS:**

Sample	Pre-Conditioning	Measured Current (mA)	Pass/Fail
Class 3 (2)	16 hours water	NA	Fail*
Class 3 (3)	16 hours water	11	Pass

*\*Sample broke down after 1 min. & 55 sec. of electrification @ 30,000 kVAC*

**A-C BREAKDOWN, ASTM D120-14, PARA 18.4.3**

The glove was filled with tap water and immersed in water with an exposed cuff length according to Table 6. A metal rod was lowered inside the glove as one electrode and a metal rod placed in the water tank outside the glove as the other electrode. A voltage was applied to the electrodes at an increasing rate of 1000 V/s until specified voltage for each class of glove was reached.

**REQUIREMENTS:**

Class	Glove Length (mm)	Exposed Cuff Length (mm)	Test Voltage (VAC)
3	410	89	40,000

**RESULTS:**

Sample	Voltage Applied (VAC)	Pass/Fail
Class 3 (1)	40,000	Pass

*\*ARDL is ISO 17025 accredited by A2LA for the test methods listed on the certificates referenced on page one. Unless specified, the current specification version is used.*

*NOTE: Non-ISO 17025 accredited test methods are designated with the ^ symbol to differentiate from ISO 17025 accredited methods in the body of the test report.\**



**OZONE RESISTANCE, ASTM D 120, PARA 18.6.2 METHOD B**

The ozone resistance test shall be made on a 100 x 150 mm (4 x 6 inch) specimen. The specimen should be draped over a 25 mm (1 inch) diameter grounded metal tube. The free ends of the specimen shall be clamped beneath the tubing electrode so that intimate contact is established between the specimen and the tubing along the upper half of the electrode. A piece of flat aluminum sheet foil, approximately 50 x 100 mm (2 x 4 inch) shall be placed over the draped specimen so as to provide adequate separation distance to prevent flashover. An electrode wire shall be connected to the aluminum foil. The outer electrode (aluminum foil) shall be energized to 15kV ac (rms). After 1-hour exposure, inspect specimen for any visible defects. Two specimens are to be tested.

**RESULTS:**

Sample	Pass/Fail
Class 3 (1)	Pass. No visible defects
Class 3 (2)	Pass. No visible defects

Prepared By:

  
Sandy Jones Hamrick  
Project Technician

Approved By:

  
Melissa Martin  
Physical Testing Manager

sc

\*ARDL is ISO 17025 accredited by A2LA for the test methods listed on the certificates referenced on page one. Unless specified, the current specification version is used.

NOTE: Non-ISO 17025 accredited test methods are designated with the ^ symbol to differentiate from ISO 17025 accredited methods in the body of the test report.\*