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TEST REPORT

REPORT NO.: 2020PC0416

PAGE: 1 OF 7

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Applicant : ENERGY SERVICE INNOVATIONS (M) SDN BHD
No. 1, Jalan USJ 1/6A, USJ 1 Subang
47620 Subang Jaya
Selangor

Manufacturer : TIFLEX LIMITED
Tiflex House Liskeard Cornwell PL14
4NB, England

Product : NEBAR WHITE GASKET
Brand: James Walker; Type of Product: GASKET
Size: 1200 mm x 1200 mm; Thickness: 6.4 mm

Reference Document : Tenaga Nasional Berhad; Tender: RFX 4000031845 – Supply of
Varius Sizes of Gasket for Grid Maintenance, Grid Division, TNB
Volume 2 (Technical Proposal)

Method of Test : Please refer to Page 2 of this test report.

Description of Sample : Please refer to Figure 1 in Page 2 of this test report.

Date Received of Complete Application : 2 July 2020

Job No. : J20201460328

Description of Test Results : This test report covers only test clauses as requested by Applicant
to SIRIM QAS International Sdn. Bhd. The test results for the
submitted test sample as described in this test report complied with
the requirement of the reference document at the respective clauses
tested.

Issued Date : 13 July 2020

Approved Signatories:

(Nomaizura Zakaria)
Testing Executive



(Rahmad Abd Shukor)
Head
Plastics and Composite Materials Section
Testing Services Department

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Methods of Test:

1. ASTM E1131: 2008 (Reapproved 2014) – Standard Test Method for Compositional Analysis by Thermogravimetry
2. ISO 4650: 2005 – Rubber – Identification – Infrared Spectrometric Method
3. ISO 48-2: 2018 – Rubber, Vulcanized or Thermoplastics – Determination of (Hardness Between 10 IRHD and 100 IRHD)
4. ASTM F152: 1995 (Reapproved 2017) – Standard Test Methods for Tension Testing of Nonmetallic Gasket Materials
5. ASTM F36: 2015 – Standard Test Method for Compressibility and Recovery of Gasket Materials
6. ASTM F152: 1995 (Reapproved 2017) – Standard Test Methods for Tension Testing of Nonmetallic Gasket Materials
7. ASTM F146: 2012 – Standard Test Methods for Fluid Resistance to Gasket Materials

Description of Sample:

Test specimens shown in Figure 1 were received on 2 July 2020.



Figure 1. Photograph of 'NEBAR WHITE GASKET; Brand: James Walker; Type of product: GASKET; Size: 1200 mm x 1200 mm; Thickness: 6.4 mm' Test Specimens



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Results:**NEBAR WHITE GASKET****Brand: James Walker; Type of Product: GASKET****Size: 1200 mm x 1200 mm; Thickness: 6.4 mm**

NO.	TEST	REQUIREMENT	RESULT	REMARK
1	<p>Continuous Operating Temperature</p> <p>Test method: ASTM E1131 (TGA Analysis)</p> <p>Test parameters:</p> <ul style="list-style-type: none"> Heat from 30°C to 600°C at 50°C/minute in nitrogen Heat from 600°C to 800°C at 50°C/minute in oxygen <p>Test date: 7 July 2020</p>	<p><u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>Minimum 110°C</p>	<p>Onset of decomposition temperature: 292°C</p>	Pass
2	<p>Thickness and Sheet Dimension</p> <p>Test method: Using calibrated caliper and measurement tape</p> <p>Test date: 3 and 13 July 2020</p>	<p><u>Schedule H and Clause iv of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>Thickness: 6.4 mm Width: 1,200 mm Length: 1,200 mm</p>	<p>Thickness: 6.4 mm Width: 1,200 mm Length: 1,200 mm</p>	<p>Pass Pass Pass</p>



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Results:**NEBAR WHITE GASKET****Brand: James Walker; Type of Product: GASKET****Size: 1200 mm x 1200 mm; Thickness: 6.4 mm**

NO.	TEST	REQUIREMENT	RESULT	REMARK
3	<p>Material</p> <p>Test method: ISO 4650 (FTIR Analysis)</p> <p>Test parameters:</p> <ul style="list-style-type: none"> • Scan method: Using Attenuated Total Reflectance (ATR) Accessory • Scan range: 4000 cm⁻¹ to 600 cm⁻¹ • Number of scans: 16 <p>Test date: 7 July 2020</p>	<p><u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>Polychloroprene Bonded Cork</p>	<p>Polychloroprene (see Figure 2)</p>	Pass
4	<p>Gasket Type</p> <p>By visual observation</p> <p>Test date: 9 July 2020</p>	<p><u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>Flat Type</p>	<p>Type: Flat</p>	Pass



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Results:**NEBAR WHITE GASKET****Brand: James Walker; Type of Product: GASKET****Size: 1200 mm x 1200 mm; Thickness: 6.4 mm**

NO.	TEST	REQUIREMENT	RESULT	REMARK
5	<p>Tensile Strength</p> <p>Test method: Method B of ASTM F152</p> <p>Test parameters:</p> <ul style="list-style-type: none"> Specimen size: 50 mm x 102 mm x 6.4 mm Test speed: 305 mm/minute Number of specimens tested: 5 <p>Test date: 3 July 2020</p>	<p><u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>1.5 MPa minimum</p>	3.6 MPa	Pass
6	<p>Recovery</p> <p>Test method: Procedure B of ASTM F36</p> <p>Test parameters:</p> <ul style="list-style-type: none"> Penetrator diameter: 12.8 mm Pre load: 4.4 N Major load: 351 N Number of specimens tested: 3 <p>Test date: 10 July 2020</p>	<p><u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>Minimum 75%</p>	97%	Pass
7	<p>Compressibility</p> <p>Test method: Procedure B of ASTM F36</p> <p>Test parameters:</p> <ul style="list-style-type: none"> Penetrator diameter: 12.8 mm Pre load: 4.4 N Major load: 351 N Number of specimens tested: 3 <p>Test date: 10 July 2020</p>	<p><u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u></p> <p>Lower limit minimum 20% Upper limit at least 30%</p>	26%	Pass



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Results:**NEBAR WHITE GASKET****Brand: James Walker; Type of Product: GASKET****Size: 1200 mm x 1200 mm; Thickness: 6.4 mm**

NO.	TEST	REQUIREMENT	RESULT	REMARK
8	Hardness IRHD N Test method: ISO 48-2 Test parameters: <ul style="list-style-type: none"> • Total indenting force: 5.40 N • Number of specimens tested: 5 Test date: 3 July 2020	<u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u> Lower limit minimum 65% Upper limit at least 80%	70	Pass
9	Transformer Oil Resistance (% Volume Swell) Test method: ASTM F146 Test parameters: <ul style="list-style-type: none"> • Temperature: 100°C • Duration: 70 hours • Number of specimen tested: 3 Test date: 6 to 9 July 2020	<u>Schedule E of Tenaga Nasional Berhad; Tender: RFX 4000031845</u> Maximum +15%	+2 %	Pass



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Results:

NEBAR WHITE GASKET

Brand: James Walker; Type of Product: GASKET

Size: 1200 mm x 1200 mm; Thickness: 6.4 mm

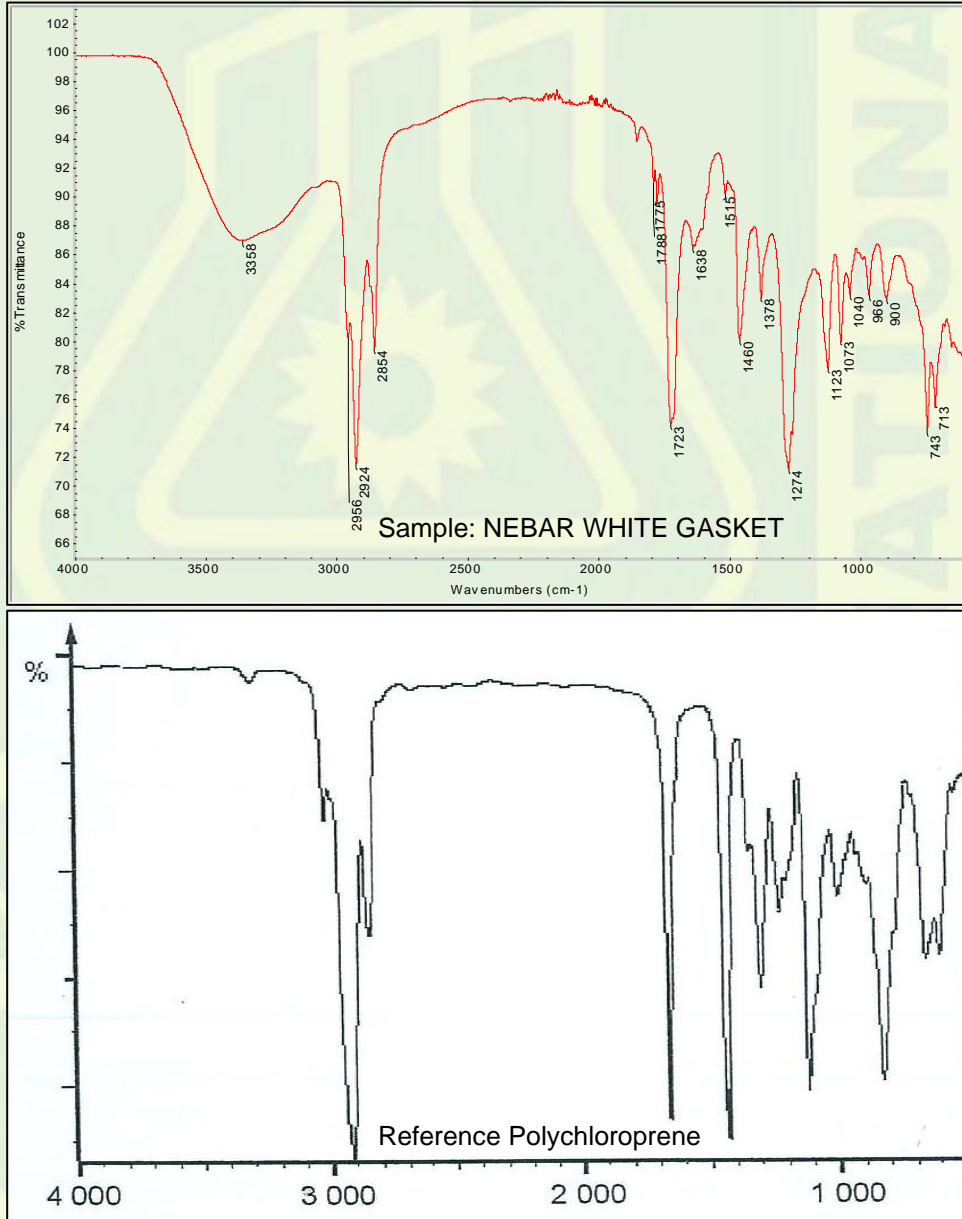


Figure 2. Split View of FTIR Spectra of 'NEBAR WHITE GASKET' Sample with Reference Polychloroprene



CONDITIONS RELATING TO THE USE OF SIRIM QAS INTERNATIONAL TEST REPORT

1. A Test Report will be issued in respect of Testing Services conducted and shall relate only to the sample actually tested. SIRIM QAS International makes no warranty whatsoever and the Applicant shall not represent in any manner that any duplication or mass production of the Product is same as the sample actually tested or that SIRIM QAS International has tested any of the duplicated or mass-produced Product. When a statement of conformity to a specification or standard is applied, the Measurement Uncertainty of test has been considered.
2. The Test Report shall not be amended, changed, varied or modified in any manner whatsoever by the Applicant or otherwise.
3. If the Test Report is to be furnished to any third party or to the public, each such Test Report shall be furnished in full, legible and in its entirety.
4. The Test Report shall not be reproduced and shall not in any event be used for any advertising purposes or whatsoever without written approval from the Chief Executive Officer of SIRIM QAS International of No 1, Persiaran Dato' Menteri, Building 8, Section 2, P.O. Box 7035, 40700 Shah Alam, Selangor Darul Ehsan.
5. Customer (Applicant/Manufacture/Factory, etc.) is not permitted to use any SIRIM QAS International, SIRIM or other SIRIM's subsidiaries logo or words on packaging, sample's manual, technical specification, brochures/flyers or any other means without the prior written approval from the Chief Executive Officer of SIRIM QAS International.
6. If such approval is obtained from the Chief Executive Officer of SIRIM QAS International, the Applicant may only include the phrase, "A sample of this product has been tested by SIRIM QAS International (Test Report No) ... (dated) (for what test) ... (to which standard)" or such similar words which stress that only the Sample was actually tested. This phrase shall only be used for the purpose of product advertisement or product promotion (eg; brochures). For avoidance of doubt, the statement shall not be used on the sample and packaging of the sample.
7. In the event there is an investigation from a Government Regulatory Agency concerning the Applicant's Test Report, SIRIM QAS International may disclose the information pertaining to the Test Report for purposes of such investigation.
8. Further or in the alternative, it is strictly forbidden unless with prior written approval from the Chief Executive Officer of SIRIM QAS International, to represent in any manner whatsoever that SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries has endorsed, approved or validated the Product of the Applicant in any manner whatsoever.
9. In the event the Applicant is found in breach of this provision, SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries without prejudice to any other rights and remedies may take whatever action necessary including but not limited to:
 - a) Informing and placing a notice in the media;
 - b) Obtaining an injunction from Court (cost on a solicitor-client basis to be borne by the Applicant);
 - c) Refusing to accept any further Product for Testing Services from the Applicant or whosoever related to the Applicant, whether subsidiary or otherwise;
 - d) Instructing the Applicant to withdraw and recall the advertisement, statement or document in question and advertise a clarification and apology to SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries twice in a national publication of SIRIM QAS International's choice at the Applicant's sole cost; and
 - e) Informing or lodging a report pertaining the Applicant's Test Report with the relevant authorities.
10. SIRIM QAS International is committed in supporting an environmentally-friendly business practices by reducing paper consumption, therefore we do not issue any hard copy of Test Report to the Applicant. However, certified true copy(ies) of the Test Report may be issued upon request by the Applicant upon payment of the relevant fee.
11. Issuance of Amendment Report due to the following reasons are chargeable to the Applicant :
 - a) Changes in details of the Applicant name and/or address;
 - b) Changes in details of the Manufacturer's name and/or address;
 - c) Changes in details of the Factory location name and/or address;
 - d) Changes in details of the model and/or type designation
12. However, issuance of Supplementary Report due to the following reasons are FOC :
 - a) Misprints and typo errors;
 - b) Missing technical information as agreed in PP1 form;
 - c) Test data not reported;
 - d) Mistake in reporting of test data
13. Corrections to report shall only be allowed if the date of issuance of the original report has not exceeded 6 months and shall be limited to maximum 3 times, after either case whichever occurs earlier, an Amendment or a Supplementary Report shall not be issued.