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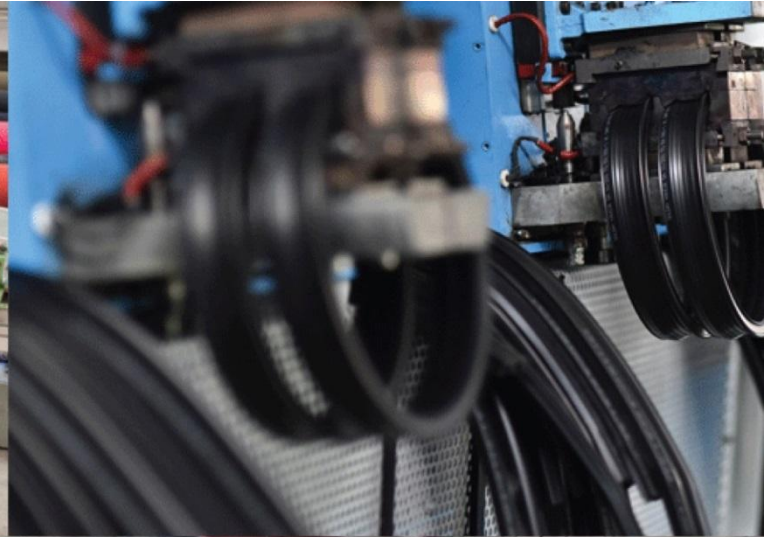


ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India

Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com



**Continuous Infra-red Heat Treatment to Drum
Seal for curing of PVC lining Compound**



ISO 9001-2008 | ISO 9001-2015 | EMS 14001 | OHSAS 18001
In Association with SVCH-Technologii, Moscow (Russia)



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Customer :	M/s. Balmer Lawrie - Van Leer Ltd. Navi Mumbai
Process :	Continuous Infra-red Heat Treatment to Drum Seal for curing of PVC lining Compound

TEST REPORT No: 47/KRDC/LAB/17 Mum 23/01/2019

Date Sample reception : 23/01/2019
ID : 47/LAB/86

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 10 Nos.
Sampling date : 28/01/2019
Product : Drum Seal
Requirement : Curing of PVE Lining Compound
Start Date test : 28/01/2019
End Date test : 28/01/2019

LABORATORY EXPERIMENTAL SET UP:



Format: F/R&D/01



LAB CONTINUOUS INFRARED HEATING SYSTEM SPECIFICATIONS:

IR Medium Wave Emitters	6 Nos (-each having 0.5 kW, 445 mm heating length)
Short Wave IR Emitter with special reflectors	6 Nos (-each having 1 kW, 406 mm heating length)
IR Emitter to Object Distance	120 mm (- in medium wave zone)
IR Emitter to Object Distance	100 mm (- in short wave zone)
Overall IR Heating Zone length	1400 mm
Web width	400 mm
IR wavelength range	0.7 to 10 microns
Direct Exposure of MW IR	500 mm
Direct Exposure of SW IR	750mm
Temperature Range	0-400°C

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	28.5°C (±5°C)
Humidity (%)	≤ 65% RH
Pressure (kN/m ² or kPa)	Not recorded

Note for recommendation: Environmental conditions have a direct impact on test results. Accuracy and consistency of test data are affected by the laboratory conditions



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EQUIPMENTS USED:

Name of Equipment	Picture of Equipment	Specifications
Compact Thermal Imaging Camera		Model :FLIR E-30 Resolution: 160x 120IR Thermal sensitivity of 0.10°C
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: $\pm^{\circ}\text{C}$ (1.8°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: $\pm 5\%$ RH Humidity resolution: 1% RH

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on given sample of drum seal to speed up the drying rate for curing of PVC lining. For this experimental run, given PVC lining compound has been injected at the corners of drum seals and then treated under infrared exposure at particular temperature and time for curing purpose. The temperature on the surface of product has been noted.

ANALYTICAL RESULTS:

Setting Temperature: 150°C

Time required for curing of PVC seal: 40 seconds

Temperature on Seal: 110-150°C



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THERMAL IMAGE OF TEMPERATURE PROFILE:

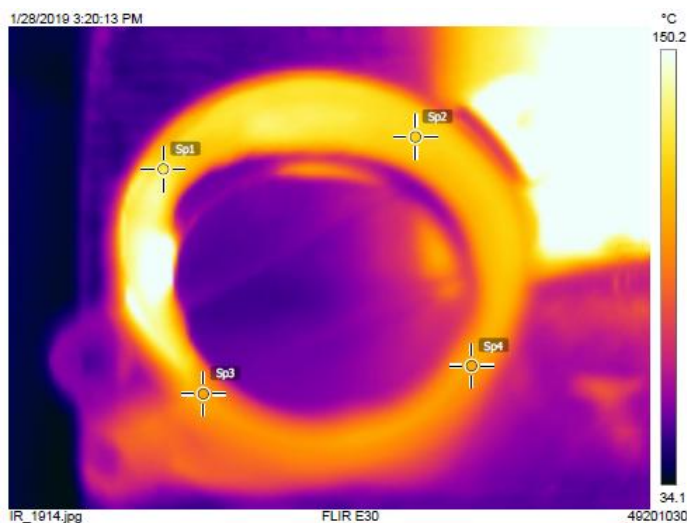
1. On Small Drum Seal:

Measurements

Sp1	132.5 °C
Sp2	126.1 °C
Sp3	112.4 °C
Sp4	113.0 °C

Parameters

Emissivity	0.95
Refl. temp.	20 °C



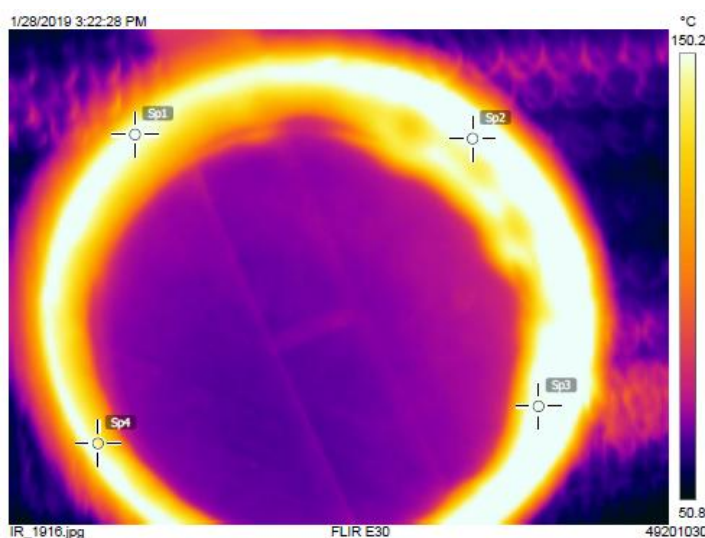
2. On Big Drum Seal:

Measurements

Sp1	150.2 °C
Sp2	150.2 °C
Sp3	150.2 °C
Sp4	144.5 °C

Parameters

Emissivity	0.95
Refl. temp.	20 °C



Format: F/R&D/01



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BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



WITHOUT PVC



WITH PVC LINING SUPPLIED BY CLIENT



CURED PVC LINING TREATED AT KRDC

Format: F/R&D/01

The value obtained is already corrected for possible recover value stated, if applicable. This document may not be reproduced or disclosed wholly or partly in any part thereof without the written consent of the laboratory management or customer. This document relates only to the specimen samples processed. The processed sample will be kept in this laboratory for 7 days from the date of heat treatment.



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OBSERVATIONS:

The drying behavior of PVC lining compound has been investigated under the infra-red heating system. It has been found that there is complete curing of PVC compound without burning and without damaging seal.

Miss Komal Bhoite
Tested By