Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com

Customer :	**M/s. Premier Seals (I) Pvt. Ltd., Pune**
Process :	**Batch Microwave Heat Treatment for Rubber curing**

TEST REPORT No: 47/KRDC/LAB/17 Mum 23/06/2018

Date Sample reception : 23/06/2018
ID : 47/LAB/44

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 37 pieces
Sampling date : 23/06/2018
Product : Natural Rubber
Requirement : Rubber curing (Temperature of core of product after treatment must be between 60-70^{o}C)
Start Date test : 23/06/2018
End Date test : 23/06/2018

LABORATORY EXPERIMENTAL SET UP:

Format: F/R&D/01

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LAB BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:

Microwave Power	2 kW(CW)
Frequency	2450 MHz ± 50
Convective Power	3.5 kW (air flow 350 l/min at 20^{o}C)
Microwave Exposure Zone (cavity)	1 cubic meter
Mode Stirrer	One
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250^{o}C
Exhaust Power	1HP
Tray Size	450x950x50 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	25.2^{o}C (±5^{o}C)
Humidity (%)	≤ 66% RH
Pressure (kN/m2 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

EQUIPMENTS USED:

Name of Equipment	Picture of Equipment	Specifications
Infrared Contact Thermometer		**Model: FLUKE 566** **Temperature Range: -40°C to 650°C** **Display Resolution: 0.1°C**

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Digital Thermometer with sensor		**Model No: TM-902C** **Temperature range: -50~750°C** **Temperature accuracy: ±1°C**
Thermo Hygrometer		**Model No: HTC-2** **Temperature accuracy: ±°C (1.8°F)** **Temperature resolution: 0.1°C (0.2°F)** **Humidity range: 10%~99% RH** **Humidity accuracy: ±5% RH** **Humidity resolution: 1% RH**

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on given of rubber slabs having same shape and size in batch microwave heating system for rubber curing. For this, 12 rubber slabs has been placed in microwave system for different time period, different power and different temperature. The surface temperature and inner core temperature of sample has been noted.

ANALYTICAL RESULTS:

Sample Code: TS1D
Sample weight: 250 grams per slab
Load per trial: 12 slabs

Sr. No.	Microwave Power (kW)	Temperature (°C)	Time (minutes)	Surface Temperature of sample (°C)	Inner Temperature of sample(°C)
1.	2	85	3	50-55	70-130
2.	1.5	85	3	35-45	70-85
3.	1.4	80	3	38-45	70-80
4.	1.4	75	2	35-40	65-77

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SAMPLE PICTURES:

OBSERVATIONS:

By the physical observation, it has been found that pre-curing of natural rubber, which is having low elastic properties, when exposed to microwave radiation, it get more resilience and elasticity. The strength and induced cross links of polymer chains of rubber slabs has to be analyzed.

K Komal

Miss Komal Bhoite
Tested By