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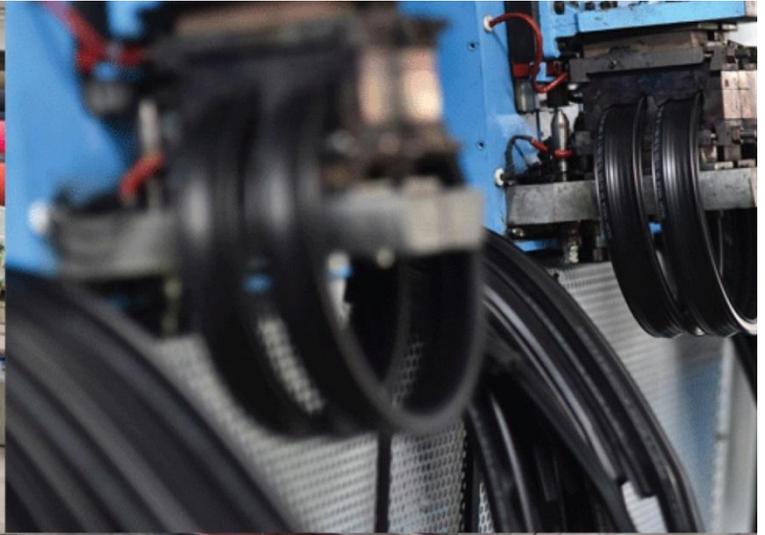
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ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambarnath (East), Thane- 421 506, India  
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**Batch Microwave Heat Treatment  
for Rubber Preheating**



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

### TEST REPORT No: 47/KRDC/LAB/17 Mum 01/10/2018

Date Sample reception : 01/10/2018  
ID : 47/LAB/61

#### SAMPLE DESCRIPTION:

Sampling : As Requested  
Sample Condition : Acceptable  
Quantity : 3 bags  
Sampling date : 08/10/2018  
Product : Natural Rubber  
Requirement : Rubber Preheating (Temperature of core of product after treatment must be greater than or equal to 70°C)  
Start Date test : 08/10/2018  
End Date test : 08/10/2018

#### EXPERIMENTAL SET UP:



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### BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:

Microwave Power	1.45 kW
Frequency	2450 MHz $\pm$ 50
Convective Power	1.5 kW
Microwave Exposure Zone (cavity)	500*350*350 mm <sup>3</sup>
Exhaust Power	0.5 HP

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**ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:**

Temperature (degree C)	28.6°C (±5°C)
Humidity (%)	≤58% 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
Digital Thermometer with sensor		Model No: TM-902C Temperature range: -50~750°C Temperature accuracy: ±1°C
Infrared Thermometer		Model: FLUKE 566 Temperature Range: -40°C to 650°C Display Resolution: 0.1°
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

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### 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 preheating. For this, rubber slabs has been placed in microwave system with different positions and heating treatment has been given for various parameters. The surface temperature and inner core temperature of sample has been noted.

### ANALYTICAL RESULTS:

	Trial 1 (sample placed vertically)	Trial 2 (samples placed horizontally)
No. of samples	12	12
Microwave Power Gain (%)	85	85
Chamber Temperature (°C)	80	80
Hot Air Temperature (°C)	85	85
Heating Cycle Time (minutes)	3	3
Microwave Current (A)	7	7
Surface Temperature (°C)	40-45	40-60
Core Temperature (°C)	70-92	70-102

### PICTURES DURING TRIALS:



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### OBSERVATIONS:

By the physical observation, it has been found that preheating of natural rubber, which is having low elastic properties, when exposed to microwave radiation, it get more resilience and elasticity. The requirement of core temperature 70°C and/or greater than 70°C has been successfully achieved.

*K Komal*

Miss Komal Bhoite  
Tested By

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