KERONE

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ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC)
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Batch Microwave Heat Treatment for Rubber Preheating

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

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Customer :	**Laboratory Experimental Analysis**
Process :	**Batch Microwave Heat Treatment for Rubber Preheating**

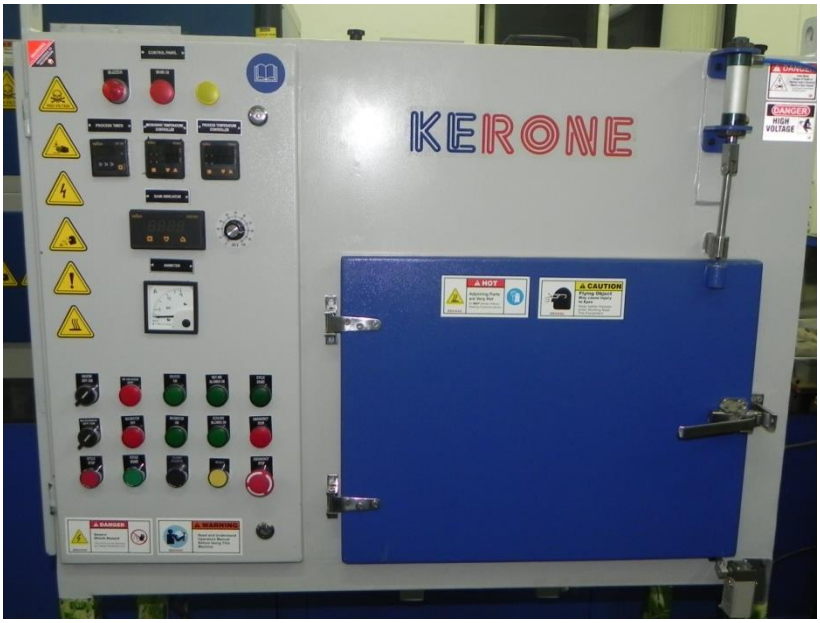
TEST REPORT No: 47/KRDC/LAB/17 Mum 11/12/2018

Date Sample reception : 11/12/2018
ID : 47/LAB/61

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 1 bag
Sampling date : 11/12/2018
Product : Natural Rubber
Requirement : Rubber Preheating (Temperature of core of product after treatment must be range between 60-70°C)
Start Date test : 11/12/2018
End Date test : 11/12/2018

EXPERIMENTAL SET UP:



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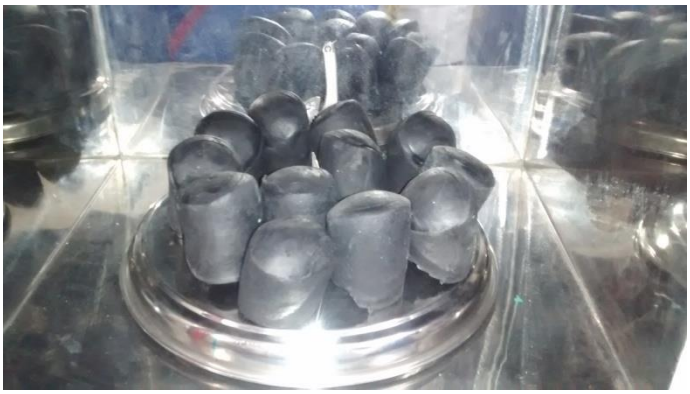

BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:

Microwave Power	1.45 kW
Frequency	2450 MHz ± 50
Convective Power	1.5 kW
Microwave Exposure Zone (cavity)	500*350*350 mm^3
Exhaust Power	0.5 HP

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	28.3^oC (±5^oC)
Humidity (%)	≤65% 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

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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**
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 preheating. For this, rubber slabs has been placed on turntable in microwave system and hot air preheating treatment has been given and then microwave heating treatment has been given for same parameters. The inner core temperature of samples has been noted.

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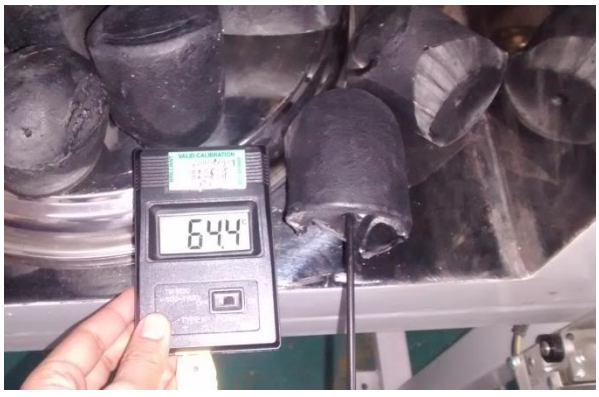
ANALYTICAL RESULTS:

	Trial (samples placed vertically)
No. of samples	12
Microwave Power Gain (%)	84
Chamber Temperature (°C)	70
Hot Air Temperature (°C)	60
Hot Air Preheating Temp (°C)	60
Preheating Time (minutes)	1
Heating Cycle Time (minutes)	2
Microwave Current (A)	7
Core Temperature (°C)	60-68

PICTURES DURING TRIALS:



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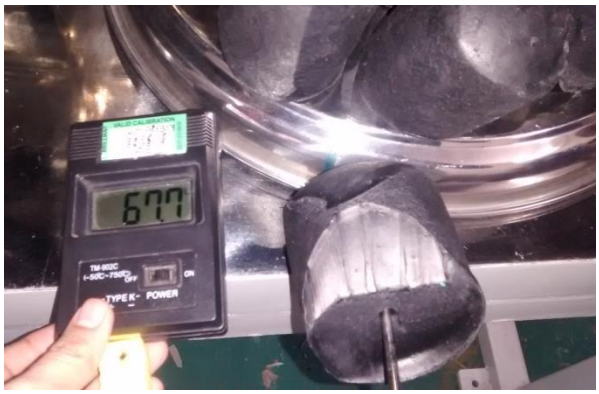

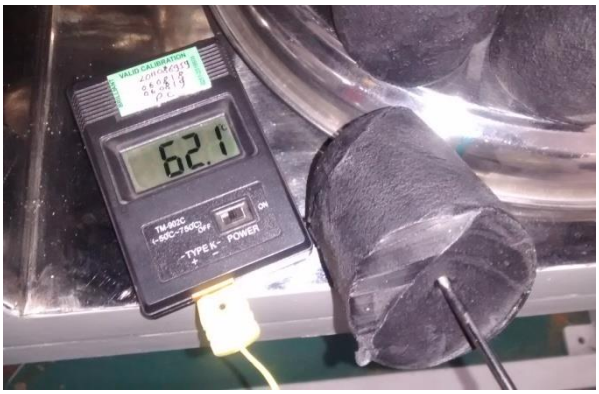

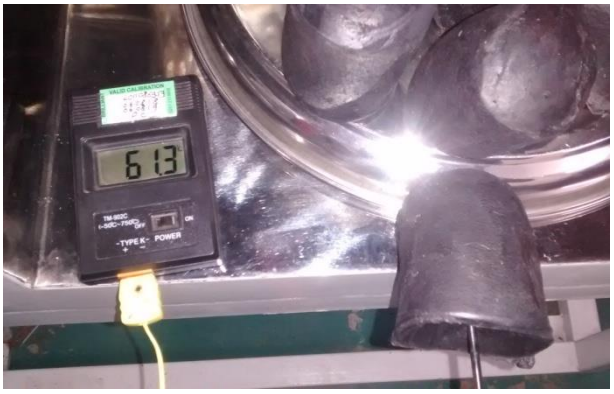

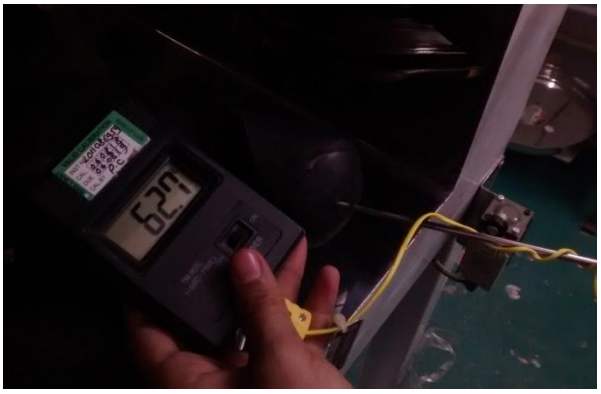

OBSERVATIONS:

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 is successfully achieved with temperature gradient 8°C.

K Komal

Miss Komal Bhoite
Tested By