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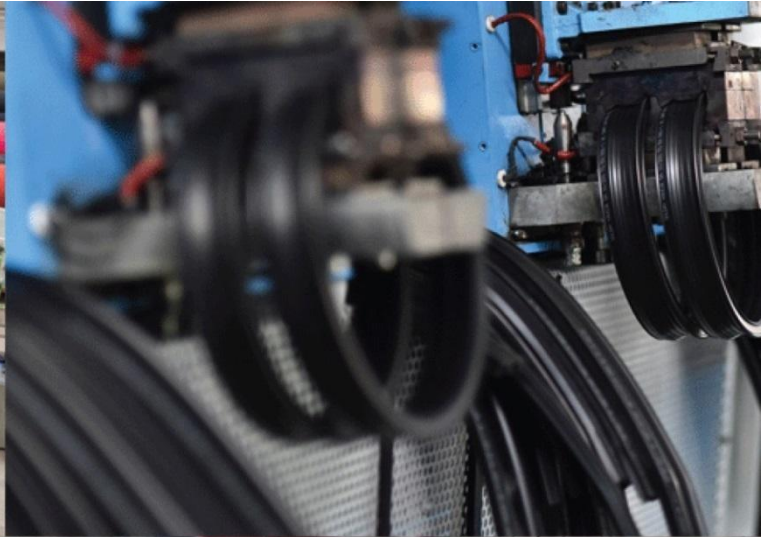
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ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC),  
B/47, Addl. MIDC. Anand Nagar, Ambarnath (East), Thane- 421 506, India  
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com



**CONTINUOUS ROTARY IR HEAT TREATMENT FOR  
DRYING OF ACTIVATED ALUMINA BEADS**





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Customer :	M/s. CILICANT CHEM PRIVATE LIMITED
Process :	Continuous rotary IR heat treatment for drying of Activated Alumina Beads

**TEST REPORT No: 64/KRDC/LAB/17 Mum 22/04/2022**

Date Sample reception : 13/04/2022  
ID : 64/LAB/22

**SAMPLE DESCRIPTION:**

Sampling : As Requested  
Sample Condition : Acceptable  
Sampling date : 21/04/2022  
Product : Activated Alumina Beads  
Requirement : To increase the strength of Alumina Beads.  
Start test Date : 21/04/2022  
End test Date : 21/04/2022

**LABORATORY EXPERIMENTAL SETUP: LAB ROTARY IR HEATING SYSTEM**



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### LAB ROTARY IR HEATING SYSTEM SPECIFICATIONS:

<b>Infrared Power</b>	5 kW
<b>Type of Infrared Emitters</b>	Quartz Infrared
<b>Rotary Drum Size</b>	Φ324 mm x 800 mm long x 3mm Thk.
<b>Thermal Monitoring System</b>	Single Channel Fiber Optic: Range -40 to 250°C
<b>Exhaust</b>	Exhaust port with manual damper
<b>Air Circulation Fan</b>	Radial Fan FHP 0.5HP




### ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

<b>Temperature (degree C)</b>	30°C (±5°C)
<b>Humidity (%)</b>	≤67% RH
<b>Pressure (kN/m<sup>2</sup> or kPa)</b>	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
<p><b>Compact Thermal Imaging Camera</b></p>		<p><b>Model:FLIR E-30</b> <b>Resolution: 160x 120IR</b> <b>Thermal sensitivity of 0.10°C</b></p>
<p><b>Thermo Hygrometer</b></p>		<p><b>Model No: HTC-2</b> <b>Temperature accuracy: ±°C (1.8°F)</b> <b>Temperature resolution: 0.1°C (0.2°F)</b> <b>Humidity range: 10%~99%</b> <b>RH Humidity accuracy: ±5%</b> <b>RH Humidity resolution: 1% RH</b></p>
<p><b>Moisture Analyzer</b></p>		<p><b>Make: Axis Balance</b> <b>Description:</b> <b>Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample&gt;5g)</b></p>



## SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on given sample i.e. Activated Alumina Beads for drying treatment. For this experimental run, Beads were passed through continuous rotary IR heating system at various set parameters. Multiple passes are given to achieve desired output. The observations are made on the basis of moisture reduction and physical changes in product samples.

## ANALYTICAL RESULTS:

### Trial No. 1:

**Initial Weight: 300g**

**Initial Moisture: 5.5%**

**IR set temperature: 350°C**

**Drum speed: 0.2 rpm**

Sr. No.	Cycle Time (minutes)	Product Temp. (°C)	Moisture Content. %	Remarks.
1.	5 min.	(80-87) °C	1.2%	Partially dried.
2.	5 min.	(90-99) °C	0.9%	Partially dried.
3.	5 min.	(100-134) °C	0.5%	Dried as desired.

**Final weight: 240g**

**Final Moisture:0.5%**

**Total cycle time: 15 min.**

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### BEFORE AND AFTER PICTURES OF TREATED SAMPLE:

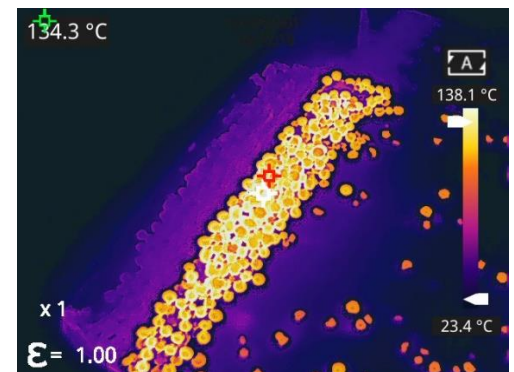
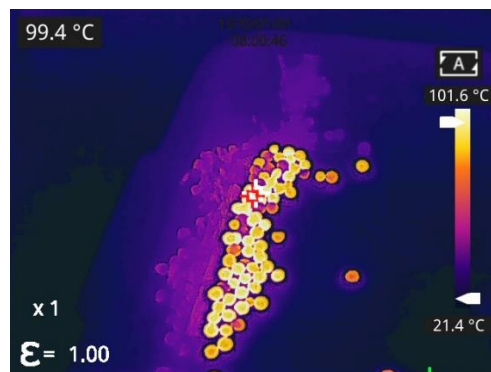
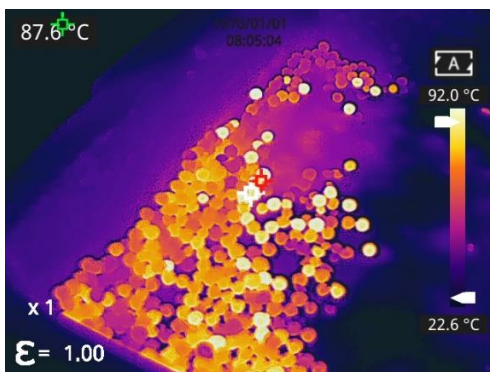


a) Untreated



b) Treated

### THERMAL IMAGE HEAT TREATMENT:



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## MOISTURE ANALYSIS REPORTS:

Drying started		Drying started	
Date	: 21-04-2022	Date	: 21-04-2022
Time	: 11:07:00	Time	: 13:20:23
Model	: AGS200	Model	: AGS200
Serial number	: 138	Serial number	: 138
Drying parameters		Drying parameters	
Product	: 0	Product	: 0
Drying temperature	: 105.0 °C	Drying temperature	: 105.0 °C
Drying profile	: standard	Drying profile	: standard
Mode	: Short mode	Mode	: Short mode
Calculation	: $((m0-m)/m0)*100\%$	Calculation	: $((m0-m)/m0)*100\%$
Finished	: 3 samples	Finished	: 3 samples
Initial weight	: 0.817 g	Initial weight	: 0.749 g
Final weight	: 0.772 g	Final weight	: 0.745 g
Drying time	: 00:06:00s	Drying time	: 00:02:00s
Sampling interval	: 20 sec	Sampling interval	: 20 sec
Moisture	: 5.5 %	Moisture	: 0.5 %
NOTE	Initial moisture Beads	NOTE	Final moisture Beads
The analysis performed by:		The analysis performed by:	
Signature	<i>Aayali</i>	Signature	<i>Aayali</i>

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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 heating behavior of Activated Alumina Beads has been investigated under the Rotary IR Heating System. The heating rate is found to be increasing with respect to increasing cycle time. Also, it has been found that the beads which were easily breakable into powder forms. After treatment they have achieved the strength and become hardened with desired moisture content as required.

A handwritten signature in black ink, appearing to read "Sayali" with a star-like symbol at the end.

Ms. Sayali Asole

Tested By