



KERONE

A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Member Of



AIMCAL (USA)



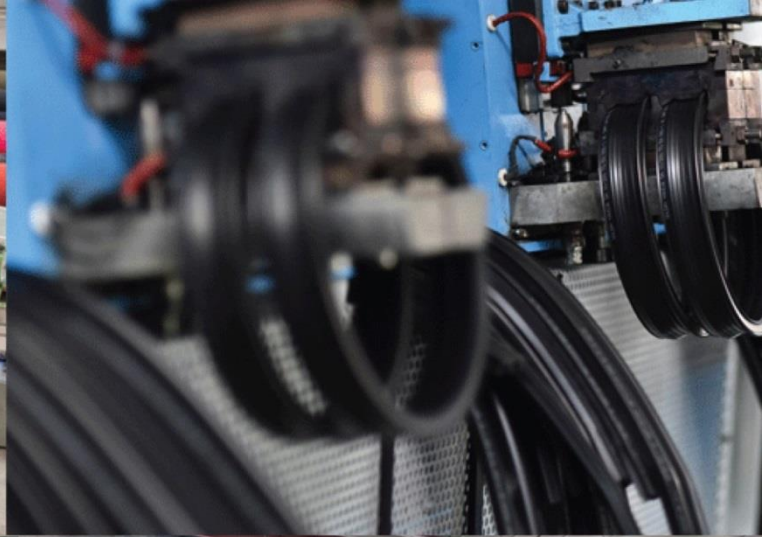
A.M.P.E.R.E (EUROPE)

In Association With



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



**Spray Drying Heat Treatment for
Drying of Hygro Solution**

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



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Customer :	M/s. BEE CHEMS
Process :	Spray Drying Heat Treatment for Drying of Hygro solution

TEST REPORT No: 75/KRDC/LAB/59 Mum 28/05/2022

Date Sample reception : 05/05/2022
ID : 75/LAB/28

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 1kg
Sampling date : 25/05/2022
Product : **Hygro Solution-N**
Requirement : Dried upto powder formation
Start Date test : 25/05/2022
End Date test : 26/05/2022

LABORATORY EXPERIMENTAL SET UP:



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LAB ELECTRIC SPRAY DRYING SYSTEM SPECIFICATIONS:

Drying chamber Installed Power	4.5 KW
Drying chamber Heat Load	250°C maximum
Pneumatic Air Pressure	6 bar
Dossing pump	6-7 rpm min.

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	33°C (±5°C)
Humidity (%)	≤65% RH
Dehumidifier Set Parameters	Temp. 50°C & RH- 10.0%
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 plant surrounding conditions.






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EQUIPMENTS USED:

Name of Equipment	Picture of Equipment	Specifications
Compact Thermal Imaging Camera		Model: FLIR E-30 Resolution: 160x 120 IR Thermal sensitivity of 0.10°C
Moisture Analyzer		Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: $\pm 1^{\circ}\text{C}$ (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 Hygro solution to speed up the drying rate. For this experimental run, given sample has been treated in spray drying system under different setting parameters. The observations are made on the basis final moisture content and physical appearance of final powder.

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ANALYTICAL RESULTS: SPRAY DRYER

Initial Moisture Content: 45.6 %

Initial Weight: 1Kg

Input Temperature (°C)	Cycle Mode	Dosing Pump (rpm)	Remark, if any
220	Continuous	15.0	Liquid convert to powder with desired particle size

Time req. to reach 220°C: 20min.

Total cycle time: 1 hour

Final Moisture Content:10.5%

Final sample recovered: 35 g

Particle Size: 0.2mm

To remove excess moisture from the final powder, the sample was dried in dehydrator at 150°C for 5 mints.

ANALYTICAL RESULTS: DEHYDRATOR

Initial Moisture Content: 10.5 %

Initial Weight: 35g

Set Temperature (°C)	Cycle time	Remark, if any
220	5 min	Dried as desired

Time req. to reach 150°C: 20min.

Total cycle time: 5 min.

Final Moisture Content:0.5%

Final sample recovered: 30 g

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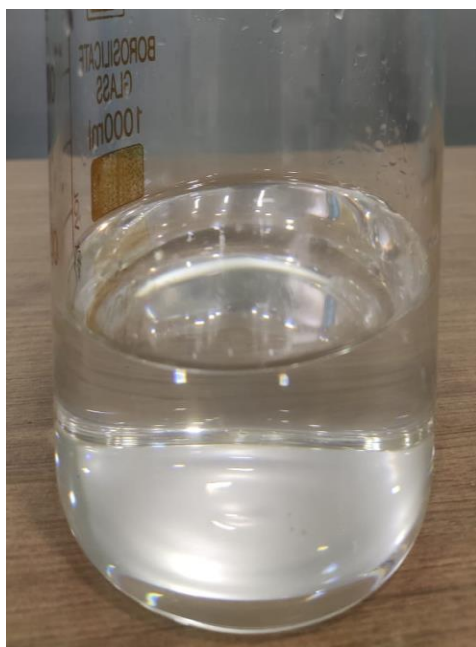
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MICROSCOPIC IMAGES:



Particle size- 0.2mm

BEFORE AND AFTER TREATMENT PICTURES OF SPECIMEN SAMPLE:



Untreated



Treated

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MOISTURE ANALYSIS REPORT:

Drying started	
Date : 26-05-2022	
Time : 11:43:09	
Model: AGS200	
Serial number : 138	
Drying parameters	
Product : 0	
Drying temperature : 105.0 °C	
Drying profile : standard	
Mode : Short mode	
Calculation : $((m0-m)/m0)*100\%$	
Finished : 3 samples	
Initial weight : 1.065 g	
Final weight : 0.579 g	
Drying time : 00:12:40s	
Sampling interval : 20 sec	
Moisture : 45.6 %	
NOTE Initial moisture	
The analysis performed by:	
Signature: <i>Angali</i>	

Drying started	
Date : 25-05-2022	
Time : 15:54:36	
Model: AGS200	
Serial number : 138	
Drying parameters	
Product : 0	
Drying temperature : 105.0 °C	
Drying profile : standard	
Mode : Short mode	
Calculation : $((m0-m)/m0)*100\%$	
Finished : 3 samples	
Initial weight : 0.610 g	
Final weight : 0.546 g	
Drying time : 00:03:40s	
Sampling interval : 20 sec	
Moisture : 10.5 %	
NOTE Final moisture (Spray dryer)	
The analysis performed by:	
Signature: <i>Angali</i>	

Drying started	
Date : 25-05-2022	
Time : 18:00:45	
Model: AGS200	
Serial number : 138	
Drying parameters	
Product : 0	
Drying temperature : 105.0 °C	
Drying profile : standard	
Mode : Short mode	
Calculation : $((m0-m)/m0)*100\%$	
Finished : 3 samples	
Initial weight : 0.789 g	
Final weight : 0.785 g	
Drying time : 00:01:40s	
Sampling interval : 20 sec	
Moisture : 0.5 %	
NOTE Final moisture (dehydrator)	
The analysis performed by:	
Signature: <i>Angali</i>	

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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OBSERVATION:

The drying behavior of Hygro Solution has been investigated under the Spray drying system. It has been found that the moisture content on the dry basis (%) decreases with respect to increase in input heating & dwell time. As per physical investigation, the solution become white coloured powder with desired particle size on drying. And the desired moisture content is obtained.

A handwritten signature in black ink, appearing to read "Sayali Asole".

Tested By,
Ms. Sayali Asole