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In Association With



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

AIMCAL (USA)



Microwave Heat Treatment for Evaporation/ Concentration of Reject 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. Trans Thane Creek Waste Management Association
Process:	Microwave Heat Treatment for Evaporation/Concentration of Reject Solution

TEST REPORT No: 85/KRDC/LAB/17 Mum 21/06/2022

Date Sample reception	: 17/05/2022
ID	: 85/LAB/21

SAMPLE DESCRIPTION:

Sampling	: As Requested
Sample Condition	: Acceptable
Sampling date	: 20/06/2022
Product	: Reject Solution
Requirement	: To evaporate the solution by Microwave heating
Start Date test	: 20/06/2022
Date test	: 20/06/2022

LAB MICROWAVE HEATING SYSTEM:



Format: F/R&D/01





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LAB MICROWAVE HEATING SYSTEM SPECIFICATIONS:

Microwave Power	1.45 kW(CW)
Frequency	2450 ± 50 MHz
Microwave Exposure Zone	500 mm length wise
Product surface temp. range	Max. 120 deg cells

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	30°C (±5°C)
Humidity (%)	≤70% 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
Compact Thermal Imaging Camera		Model: FLIR E-30 Resolution: 160x 120IR Thermal sensitivity of 0.10°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
Moisture Analyzer		Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)

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SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on Reject solution to speed up the drying rate. For this experimental run, given sample has been passed in MW heating system to Evaporate the Solution. Observations are made on the weight and appearance.

ANALYTICAL RESULTS:

TRIAL-1

Initial Wt.: 580g

Cycles	Specifications of Microwave	On product temp	Time required	weight (grams)	Remarks.
C1	Microwave intensity: 100%	(40-50)°C	45 min	370	Drying started
C2	Microwave intensity: 100%	(51-54)°C	45 min	280	Drying continuous
C3	Microwave intensity: 100%	(54-60)°C	45 min	260	Drying variants
C4	Microwave intensity: 100%	(59-65)°C	45 min	175	Treated as desired

Final Weight: 175g Total time required: 3 hours.

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BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



a) Untreated

b) Treated

THERMAL IMAGE:

Measurem	ents	
Sp1	54.6 °C	
Sp2	59.9 °C	76.9
Sp3	60.2 °C	-¢ ₩.6 ℃
Parameters	5	- <mark>↓</mark> 58.9 ℃60.2 ℃
Emissivity	1.00	x1
Tama	76 9°C	24.7 °



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OBSERVATION:

The drying behavior of Reject has been investigated under the Microwave heating system. The drying rate is found to be increasing with respect to increase in time. As per physical investigation, it has been found that the product weight is loss during the process. It has been observed that the product was successfully Evaporated as it was passed through the Microwave heating chamber.

Ms. Sayali Asole (Tested By)

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