

IN ASSOCIATION WITH EMItech, ITALY

Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com

Customer :	M/s. DARSHAN INTERNATIONAL, BANGALORE
Process :	Batch Vacuum Microwave Dehydrator Treatment for Drying of Marigold Flower

TEST REPORT No: 47/KRDC/LAB/17 Mum 29/07/2021

Date Sample reception	: 29/07/2021
ID	: 47/LAB/02

SAMPLE DESCRIPTION:

Sampling	: As Requested
Sample Condition	: Acceptable
Quantity	: 500 g
Sampling date	: 29/07/2021
Product	: Fresh Marigold flowers
Requirement	: To be Dried completely
Start Date test	: 29/07/2021
End Date test	: 29/07/2021

LABORATORY EXPERIMENTAL SET UP:



Format: F/R&D/01



Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com



LAB BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:

Magnetron Power Generator Rating	Air Cooled 1.45KW/2450+50 MHZ x 1 No.
Convection Power	1.5 KW
Total Heater Power	3KW (MW 1.45KW + Convection 1.5KW)
Supply Voltage required	230V 2Ph supply
MW Overall (LxWxH) in mm	620X670X640
Cavity Chamber (INNER) in mm	L-300 & Φ220
Vacuum Pump Rating	560W, 220V/50Hz, 2880rpm
Free Air Displacement	10.7 CFM
Vacuum Pump (LxWxH)	430x200x300

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	26°C (±5°C)
Humidity (%)	≤ 74% 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

Format: F/R&D/01



Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com

EQUIPMENTS USED:

Name of Equipment	Picture of Equipment	Specifications
Compact Thermal Imaging Camera		Model: FLIR E-30 Resolution: 160 x 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	THERE AND THE	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 Marigold flowers to speed up the drying rate. For this experimental run, product has been placed on a perforated tray and then kept in Batch Vacuum Microwave Dehydrator system. The observations are made after every 10 minutes. Also, initial weight before drying, final weight after drying, initial moisture content & final moisture content is recorded.

Format: F/R&D/01



ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com

ANALYTICAL RESULTS:

Initial Wt. - 200g Initial moisture – 87.1% **CYCLE NO.1-**

Microwave Power: 1.16 kW (80% Capacity) Heater: 90°C (switch 1) Cycle Time- 10 mins

Cycle	Weight noted	Total weight	Total weight	Remarks, if any
Time	(grams)	loss(grams)	loss(in %)	
After 10min	128	72	36%	Drying rate started
After 20min	75	53	41.4%	Drying continues
After 30min	40	35	50%	Variant of Drying
After 40min	27	13	32.5%	Drying completes

Final weight after drying: 27 grams Final Moisture Content: 6.6%

Format: F/R&D/01



IN ASSOCIATION WITH EMItech, ITALY EMitech

ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com

MOISTURE ANALYSIS REPORTS:

Drying starte	d	Drying start	ed
Date :29-07-2021 Fime :13:36:03 fodel:AGS200 Serial number :	138	Date :30-07-2021 Time :11:03:14 Model:A65200 Serial number :	139
Drying parameters		brying parameters	
Product	: 0	Product	: 0
Drying temperature	: 105.0 °C	Drying temperature	: 105.0 °C
Drying profile Mode Calculation Finished	: standard : Short mode : ((mO-m)/mO)#100% : 3 samples	Drying profile Mode Calculation Finished	: standard : Short mode : ((mD-m)/m0)#100% : 3 samples
Initial weight	: 1.541 g	Initial weight	: 0.742 g
Final weight	: 0.199 9	Final weight	: 0.693 g
Drying time Sampling interval	: 00:25:20s : 20 sec	Drying time Sampling interval	: 00:03:00s : 20 sec
Moisture	: 87.1 %	Moisture	: 6.6 %
NOTE Anitial	moisture of	NOTE Final	moisture of
Marigold.		Maria	010
The analysis performed by: 0		The analysis per	formed by: 0
Homel		Signature	for.

AFTER PICTURES OF TREATED SPECIMEN SAMPLE:

Untreated

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.

Treated





Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com

OBSERVATIONS:

The Drying behavior of marigold flower has been investigated under the Vacuum MW Dehydrator system. The drying rate is found to be increasing with respect to increasing drying time. It has been found that the moisture content on the dry basis (%) decreases with respect to increase drying time. As per physical investigation, it has been observed, that there is crunchiness in texture without any kind of burning.

Ms. Komal Ingle

(Tested By)

Format: F/R&D/01