

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

Customer :	M/s Prem Henna Private Limited, Nashik
Process :	Batch Microwave Heat Treatment for Drying of Henna

TEST REPORT No: 47/KRDC/LAB/17 Mum 27/04/2018

Date Sample reception : 27/04/2018
ID : 47/LAB/33

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 30 kg
Sampling date : 11/05/2018
Product : Herbal Henna (Mehandi)
Requirement : Final product must be dried upto 1-2% moisture content
Start Date test : 11/05/2018
End Date test : 11 /05/2018

LABORATORY EXPERIMENTAL SET UP:



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LAB BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:


Microwave Power	2 kW(CW)
Frequency	2450 MHz \pm 50
Convective Power	3.5 kW (air flow 350 l/min at 20°C)
Microwave Exposure Zone (cavity)	1 cubic meter
Mode Stirrer	One
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250°C
Exhaust Power	1HP
Tray Size	450x950x50 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	30.8°C (\pm 5°C)
Humidity (%)	\leq 68% RH
Pressure (kN/m ² 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

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

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<p>Moisture Analyzer</p>		<p>Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)</p>
<p>Thermo Hygrometer</p>		<p>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</p>

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on herbal henna mehendi without adding any additive to speed up the drying rate. For this experimental run, some amount of sample was taken and placed it on a microwave safe tray with uniform layer of thickness about 5 mm. Observations are made after every 10 minutes. Initial weight before drying, final weight after drying, initial moisture content and final moisture content has been taken.

ANALYTICAL RESULTS:

Setting Temperature: 70°C

Microwave Power: 0.5 kW

Initial Sample Weight: 250 grams

Initial Moisture Content: 6.4%

Sr. No.	Time (minutes)	Weight noted (grams)	Total weight loss(grams)	Temperature on sample(°C)	Remarks, if any
1.	After 10	244	6	49.8	Drying rate started
2.	After 20	241	9	51.2	Drying phase continue
3.	After 30	239	11	54.9	Variant of Drying rate
4.	After 40	238	12	58.1	Variant of Drying rate

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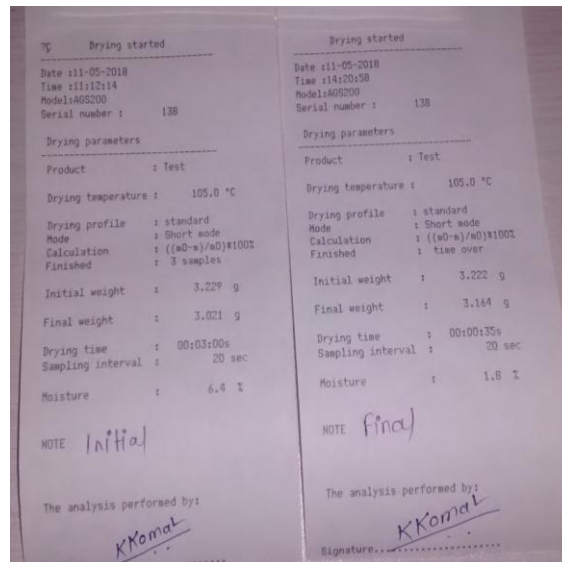
5.	After 50	237	13	60.2	Variant of Drying rate
6.	After 60	236	14	66.6	Required Drying rate

Sample weight after drying: 236grams

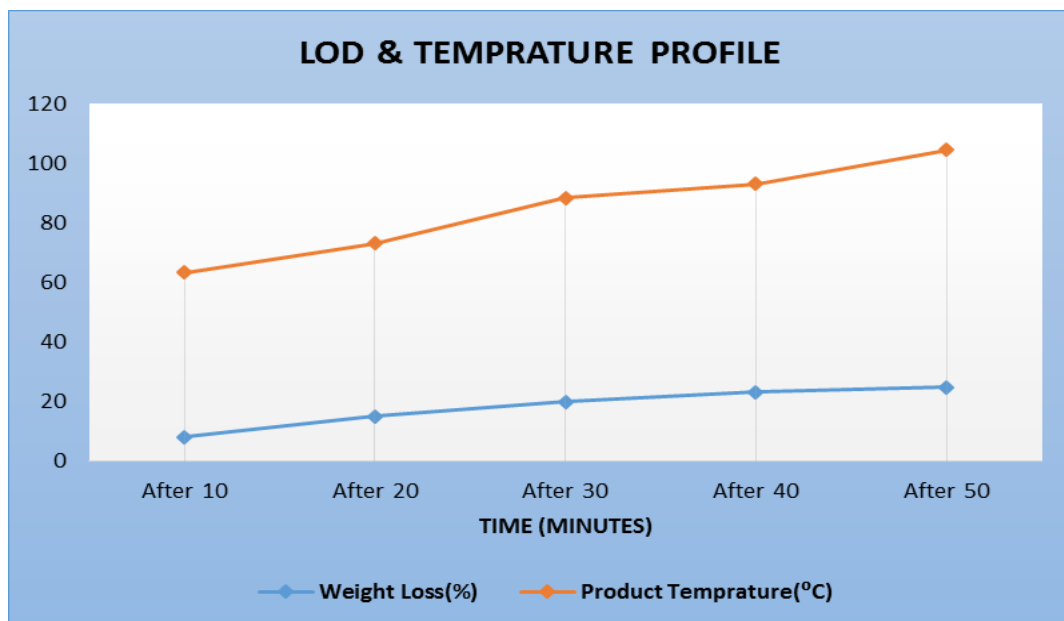
Total weight loss on drying: 14 grams

Final Moisture Content: 1.8%

MOISTURE ANALYSIS REPORTS:



GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:



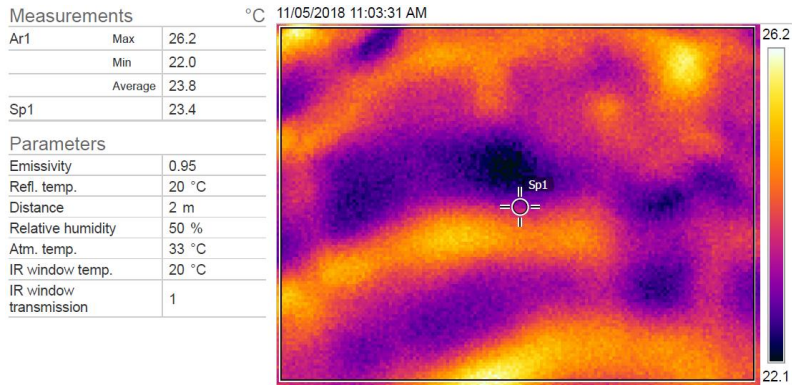
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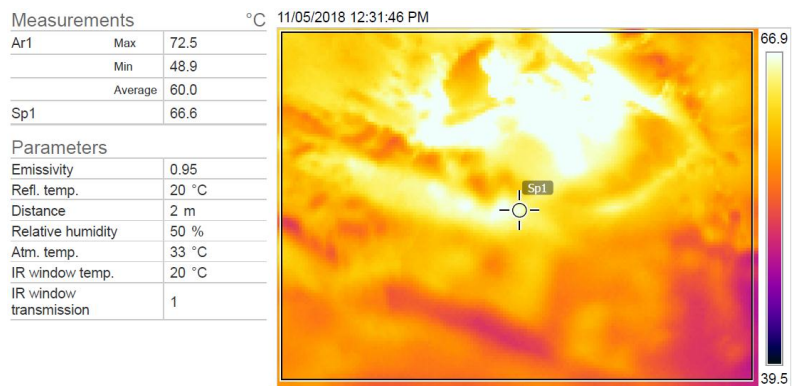
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THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. Before Heat Treatment



2. After Heat Treatment:



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



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OBSERVATIONS:

The Drying behavior of herbal henna (mehandi) powder has been investigated under the microwave irradiation mode dryer. The drying rate is found to be decreasing 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 no colour change and no textural change in the processed sample.



Miss Komal Bhoite
Tested By

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