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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

Continuous Infra-red Drying of Rose Petals

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Customer :	**M/s. DARSHAN INTERNATIONAL**
Process :	**Continuous IR Drying of Rose Petals**

TEST REPORT No: 47/KRDC/LAB/17 Mum 15/07/2021

Date Sample reception : 30/07/2021
ID : 47/LAB/14

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 350 g
Sampling date : 30/07/2021
Product : Fresh Rose flowers
Requirement : To be Dried completely
Start Date test : 30/07/2021
End Date test : 30/07/2021

LABORATORY EXPERIMENTAL SET UP:

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LAB CONTINUOUS INFRARED HEATING SYSTEM SPECIFICATIONS:

IR Medium Wave Emitters	6 Nos (-each having 0.5 kW, 445 mm heating length)
Short Wave IR Emitter with special reflectors	6 Nos (-each having 1 kW, 406 mm heating length)
IR Emitter to Object Distance	120 mm (- in medium wave zone)
IR Emitter to Object Distance	100 mm (- in short wave zone)
Overall IR Heating Zone length	1400 mm
Web width	400 mm
IR wavelength range	0.7 to 10 microns
Direct Exposure of MW IR	500 mm
Direct Exposure of SW IR	750mm
Temperature Range	0-400°C

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	27.1^{o}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
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: ±°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 Rose petals to speed up the drying rate. For this experimental run, given sample has been placed on a perforated tray and then passed under Continuous IR heating system with suitable parameters. Observations are made on the final moisture content of sample, weight and appearance.

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ANALYTICAL RESULTS:

Initial Moisture Content:87.3%

TRIAL-1:

Setting Temperature: 100°C
Intensity of IR : 90%
Initial Weight: 38g
Cycle Time of 1 pass: 4mins 30sec

No. of passes	Total time	Product Temperature (°C)	Remark
After 1st pass	4 min 30sec	44°C	Drying started
After 2nd pass	9 min	49°C	Drying continues
After 3rd pass	13 min 30sec	51°C	Drying continues
After 4th pass	18min	52°C	Drying continues
After 5th pass	22min 30sec	55°C	Dried

Final Weight: 3 g
Final Weight loss in %: 92.10%
Final Moisture content: 26%

BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:

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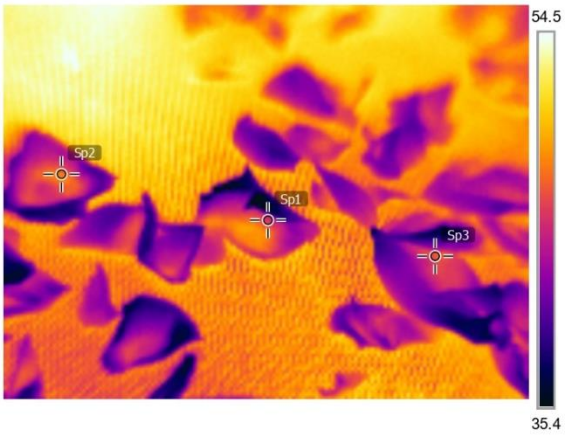
a) UNTREATED **b) TREATED**

THERMAL ANALYSIS REPORTS :

During 1st cycle-

Measurements	
Sp1	45.6 °C
Sp2	48.1 °C
Sp3	46.7 °C
Parameters	
Emissivity	0.95
Refl. temp.	20 °C



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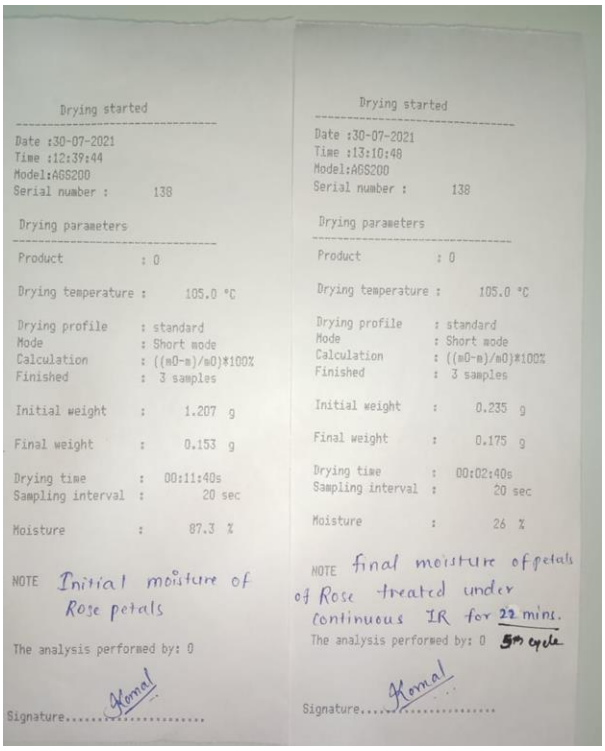
MOISTURE ANALYSIS REPORTS:



Drying started

Date :30-07-2021
Time :12:39:44
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 : 1.207 g
Final weight : 0.153 g
Drying time : 00:11:40s
Sampling interval : 20 sec
Moisture : 87.3 %

NOTE Initial moisture of Rose petals

The analysis performed by: 0

Signature.....Komal

Drying started

Date :30-07-2021
Time :13:10:48
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 : 0.235 g
Final weight : 0.175 g
Drying time : 00:02:40s
Sampling interval : 20 sec
Moisture : 26 %

NOTE final moisture of petals of Rose treated under continuous IR for 22 mins. 5th cycle

The analysis performed by: 0

Signature.....Komal

OBSERVATIONS:

The drying behavior of Rose Petals has been investigated under the continuous IR heating system. As per physical investigation, it has been observed that it moisture of petals reduces with increase in cycle time and temperature.

Ms. Komal Ingle
Tested By