

Kerone Research & Development Centre (KRDC), Mumbai

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

Customer :	Laboratory Experimental Analysis
Process :	Continuous Microwave Heat Treatment for Sterilization of Semolina

TEST REPORT No: 47/KRDC/LAB/17 Mum 05/03/2018

Date Sample reception : 05/03/2018

ID : 47/LAB/22

SAMPLE DESCRIPTION:

Sampling : As Requested

Sample Condition : Acceptable

Quantity : 10 kilograms

Sampling date : 05/03/2018

Product : Fine coarse semolina (Arranged from local market)

Requirement : Sterilization of Semolina

Start Date test : 07/03/2018

End Date test : 07/03/2018

LABORATORY EXPERIMENTAL SET UP:



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LAB CONTINUOUS MICROWAVE HEATING SYSTEM SPECIFICATIONS:

Microwave Power (CW oscillation) Three Microwave Generators	3 kW
Frequency	2450 ± 50 MHz
Helical Conveyor System	1-10 Hz, 20.1 to 53.6 minute helix
Material Feeding Pipe (Polypropylene)	2100 mm length, feed opening 53.5 mm
Material Feed Sensor	For down mass flow sensing
Honey comb filters	2 numbers
Air extraction system	Adjustable by POT
Loading Hopper with flow regular	Adjustable by metering gauge

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	38°C (±5°C)
Humidity (%)	≤ 36 % 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

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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Moisture Analyzer



Make: Axis Balance

Description:

Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)

PROCESS:

Fine coarse particle of semolina (10 kg) has been fed to loading hopper with the help of feeding cup and mass flow adjusted by meter gauge, then the fed material move through the helical conveyor, which is inside the heating zone and processed material has been collected at discharge point of the sterilization plant.

ANALYTICAL RESULTS:

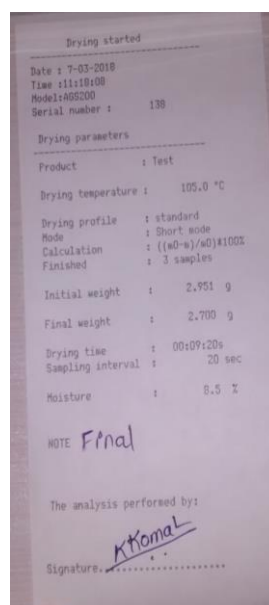
Product: Semolina

Initial Moisture Content: 11.4%

Microwave Power Intensity (%)	Helical Conveyor Speed (Hz)	Initial Temperature (°C)	Final Temperature (°C)
100	3	32.1	68-70

Final Moisture Content: 8.5 %

MOISTURE ANALYSIS REPORTS:



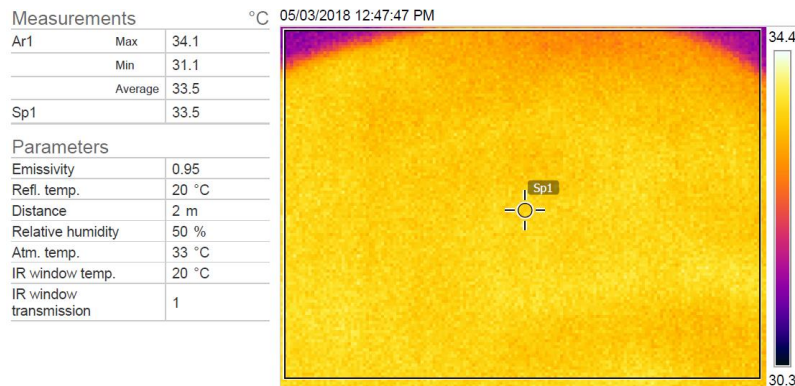
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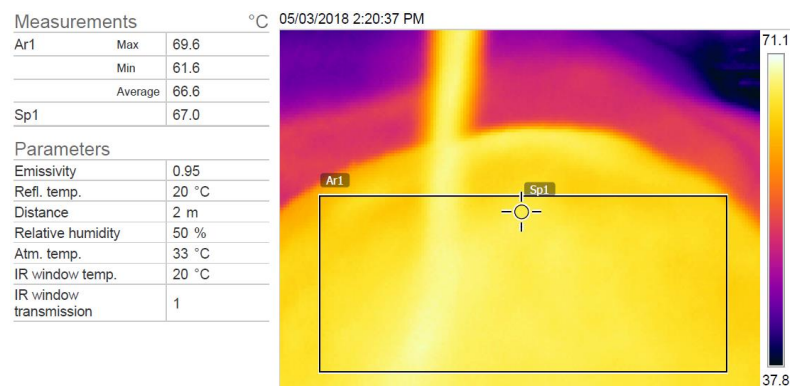
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THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. Before Heat Treatment



2. After Heat Treatment:



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



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The Drying behavior of fine coarse semolina has been investigated under the microwave irradiation mode dryer. 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 no browning in texture without burning effect.



Miss Komal Bhoite
Tested By



Dr. Uttam K. Goswami
Approved By

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