

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

Customer :	M/s Top Anil Maarketing Company, Dindigul, Tamil Nadu
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:**



**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.*

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

### LAB CONTINUOUS MICROWAVE HEATING SYSTEM SPECIFICATIONS:

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

### ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

<b>Temperature (degree C)</b>	38°C (±5°C)
<b>Humidity (%)</b>	≤ 36 % RH
<b>Pressure (kN/m2 or kPa)</b>	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
<b>Compact Thermal Imaging Camera</b>		<b>Model: FLIR E-30</b> <b>Resolution: 160 x 120 IR Thermal</b> <b>sensitivity of 0.10°C</b>

**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.*

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

**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:**



**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.

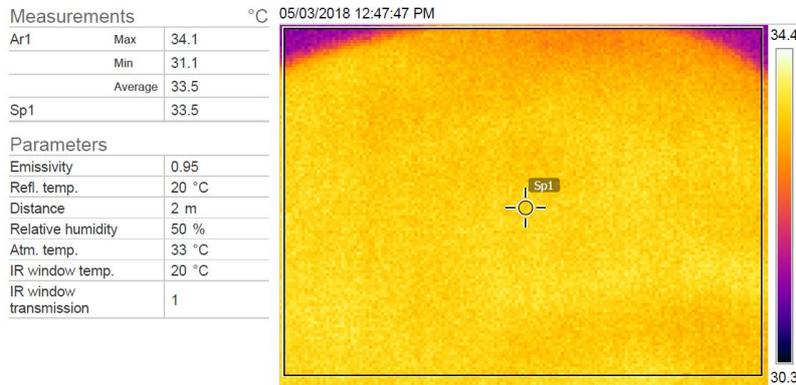
**Kerone Research & Development Centre (KRDC), Mumbai**

B/47, Addl. MIDC. Anand Nagar, Ambarnath (East), Thane- 421 506, India

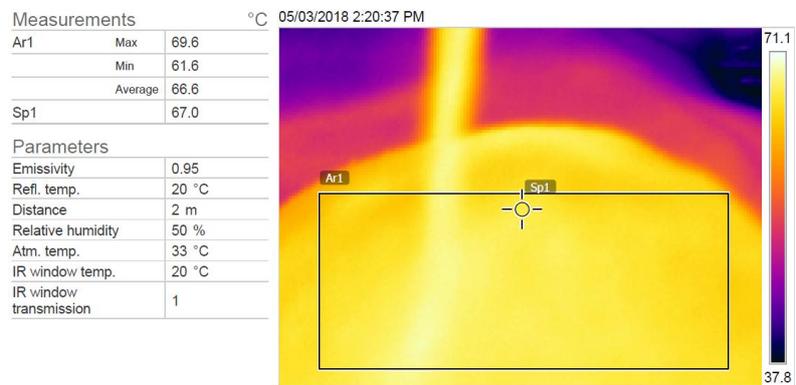
Tel- +91-251-2620542/13/44/45/46, Email-[info@kerone.com](mailto:info@kerone.com), [www.kerone.com](http://www.kerone.com)

**THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:**

**1. Before Heat Treatment**



**2. After Heat Treatment:**



**BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:**



**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.*

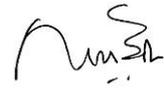
**Kerone Research & Development Centre (KRDC), Mumbai**  
B/47, Addl. MIDC. Anand Nagar, Ambarnath (East), Thane- 421 506, India  
Tel- +91-251-2620542/13/44/45/46, Email-[info@kerone.com](mailto:info@kerone.com), [www.kerone.com](http://www.kerone.com)

### **OBSERVATIONS:**

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

**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.*