



A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Member Of



AIMCAL (USA)



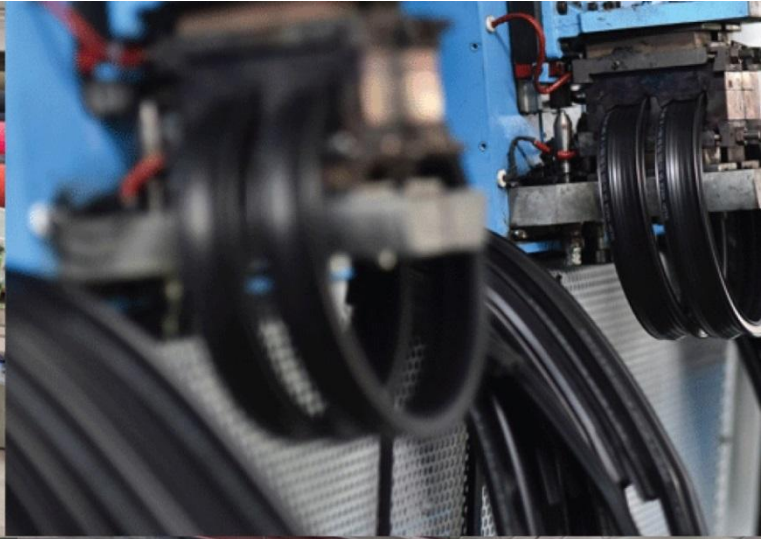
A.M.P.E.R.E (EUROPE)

In Association With



ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC),
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



**Batch Convection Heat Treatment for
Dehydration of Mushrooms**



Kerone Research & Development Centre (KRDC)
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 :	M/s. Prafulla Agarwal
Process :	Batch Convection Heat Treatment for Dehydration of Mushrooms

TEST REPORT No: 47/KRDC/LAB/17 Mum 01/09/2020

Date Sample reception : 01/09/2020
ID : 47/LAB/175

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 200 grams
Sampling date : 01/09/2020
Product : Button Mushroom
Requirement : Final Moisture should be around 10%
Start Date test : 01/09/2020
End Date test : 01/09/2020

LABORATORY EXPERIMENTAL SET UP:



Format: F/R&D/01



Kerone Research & Development Centre (KRDC)

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



LAB BATCH CONVECTION HEATING SYSTEM SPECIFICATIONS:

Heating Zone (width*height*depth)	550*650*550 mm
No. of Heaters	4
Total Heater Power	3 kW
Motor	0.5 HP
No. of trays	7
Tray size (width*height*depth)	600500 X 35
Nominal Capacity of Dehumidifier	1 tr each
Humidity Range of Dehumidifier	20-90%

Format: F/R&D/01



ELECTRO MAGNETIC Innovative technologies



A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com



Max. Ambient Temperature of Dehumidifier	40°C
Water Removal Rate of Dehumidifier	80 lt per day at NTP

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (°C)	28°C (±5°C)
Humidity (%)	≤83% 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: 160x 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)

Format: F/R&D/01



ELECTRO MAGNETIC Innovative technologies



A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com

<p>Thermo Hygrometer</p>		<p>Model No: HTC-2 Temperature accuracy: $\pm 0.1^{\circ}\text{C}$ (1.8°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: $\pm 5\%$ RH Humidity resolution: 1% RH</p>
---------------------------------	---	---

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on Button Mushrooms to speed up the drying rate. For this experimental run, given mushroom sample has been sliced vertically in 5-6 mm thickness by removing the stem and these slices has been placed in a perforated tray in such a manner that none of the pieces are touching and there is some space around each slice for air to circulate for achieving even drying characteristics. Observations are made after every 15 minutes on LOD basis. Also, initial and final moisture content has been taken.

ANALYTICAL RESULTS:

Setting Temperature: 65°C

Initial Weight: 115 grams

Initial Moisture Content: 92.9%

Sr. No.	Time (minutes)	Weight noted (grams)	Weight loss (%)	Temperature on sample ($^{\circ}\text{C}$)	Remarks, if any
1.	After 15	80	30.4	38	Drying rate started
2.	After 30	57	50.4	40	Drying phase continue
3.	After 45	40	65.2	42	Variant of Drying rate
4.	After 60	27	76.5	45	Variant of Drying rate
5.	After 75	14	87.8	48	Variant of Drying rate
6.	After 90	10	91.3	50	Required Drying rate

Final Weight: 10 grams

Total Weight Loss: 91.3%

Final Moisture Content: 13%

Format: F/R&D/01



ELECTRO MAGNETIC Innovative technologies

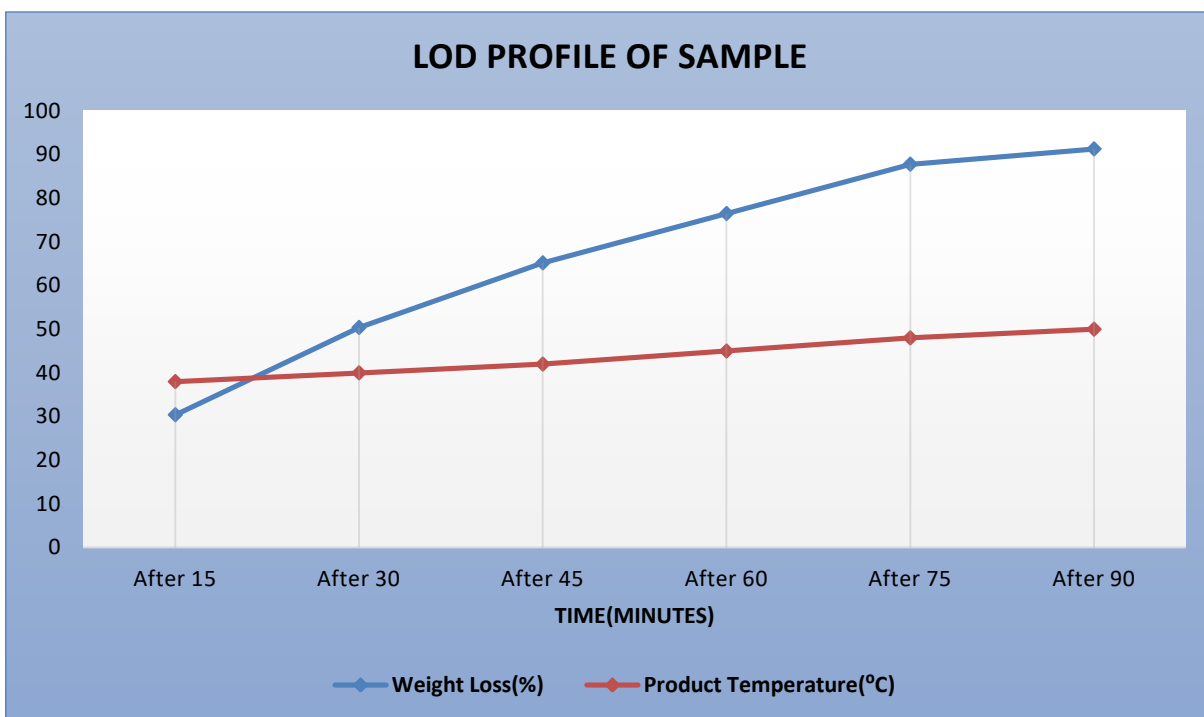


A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC)

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

GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:



THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

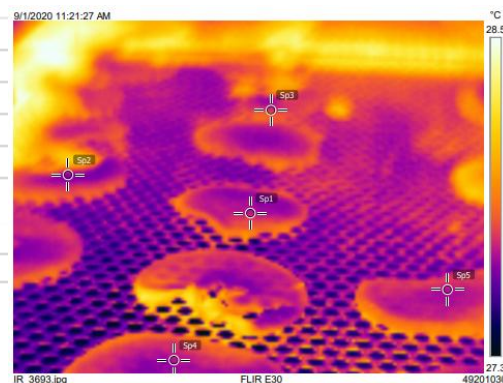
1. Before Heat Treatment:

Measurements

Sp1	27.2 °C
Sp2	27.6 °C
Sp3	28.0 °C
Sp4	28.8 °C
Sp5	27.9 °C

Parameters

Emissivity	0.95
Ref. temp.	20 °C



Format: F/R&D/01



ELECTRO MAGNETIC Innovative technologies



A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com

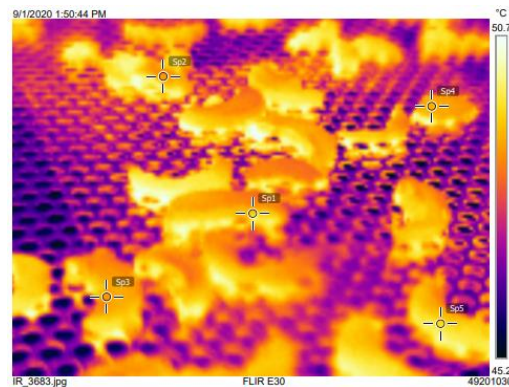
2. After Heat Treatment:

Measurements

Sp1	50.5 °C
Sp2	47.1 °C
Sp3	48.0 °C
Sp4	46.8 °C
Sp5	48.9 °C

Parameters

Emissivity	0.95
Refl. temp.	20 °C



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



BEFORE



AFTER

Format: F/R&D/01



Kerone Research & Development Centre (KRDC)
B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com

REHYDRATION TEST:

For this test, little amount of treated sample has been taken in a glass and then boiled water added to it and covered it for 7-10 minutes followed by stirring.





ELECTRO MAGNETIC Innovative technologies

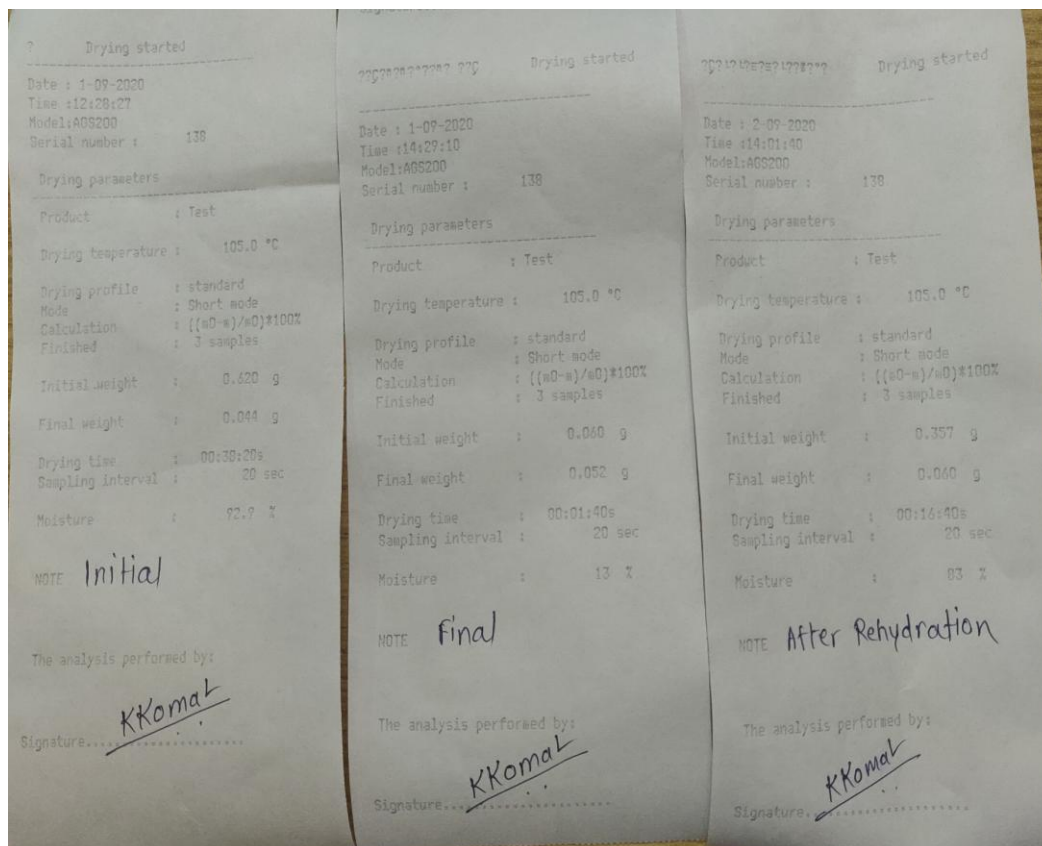


A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com

MOISTURE ANALYSIS REPORTS:



OBSERVATIONS:

The drying behavior of Button Mushroom has been investigated under the convection heating system. The drying rate is found to be increasing with respect to increase in time. It has been found that the moisture content on the dry basis (%) decreases with respect to increase in drying time. As per physical investigation, it has been observed that required moisture content has been achieved with colour change in final product.

Miss Komal Bhoite
Tested By

Format: F/R&D/01