

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 Foodiverse, Cairo, Egypt
Process :	Batch Convection Heat Treatment for Drying of cooked Pasta

TEST REPORT No: 47/KRDC/LAB/17 Mum 22/05/2018

Date Sample reception : 22/05/2018
ID : 47/LAB/36

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 1 kg
Sampling date : 24/05/2018
Product : Elbow pasta
Requirement : Final product must be cooked and dried upto 4-5% moisture content
Start Date test : 24/05/2018
End Date test : 24/05/2018

LABORATORY EXPERIMENTAL SET UP:



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Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com**LAB BATCH CONVECTION HEATING SYSTEM SPECIFICATIONS:**


Heating Zone (width*height*depth)	510*480*410 mm
No. of Heaters	6
Total Heater Power	6 kW
Motor	0.5 HP
Centrifugal Exhaust Blower	1440 rpm
No. of trays	6
Tray size (width*height*depth)	560*25*435 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	30.7°C (±5°C)
Humidity (%)	≤ 58% 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 pasta without adding any additive to speed up the drying rate. For this experimental run, pasta has been cooked completely in salt and water solution for about 10-15 minutes and after draining rinsed in cold water. Then this completely cooked pasta on a dehydrator tray has placed in such a manner that it form uniform layer for hot air to circulate for achieving even drying characteristics and then kept in batch convection heating system for treatment. The observations are made after every 30 minutes. Also, initial weight before drying, weight after cooking, final weight after drying, initial moisture content, moisture content after cooking, final moisture content after treatment, and moisture content after rehydration test has been taken.

ANALYTICAL RESULTS:

Setting Temperature: 60°C

Thickness of layer: Single layer of pasta

Initial Sample Weight: 500 grams

Initial Moisture Content: 1.1%

Weight after Cooking: 1155 grams

Moisture Content after Cooking: 56.1%

Sr. No.	Time (minutes)	Weight noted (grams)	Total weight loss(grams)	Temperature on sample(°C)	Remarks, if any
1.	After 30	961	194	45.4	Drying rate started

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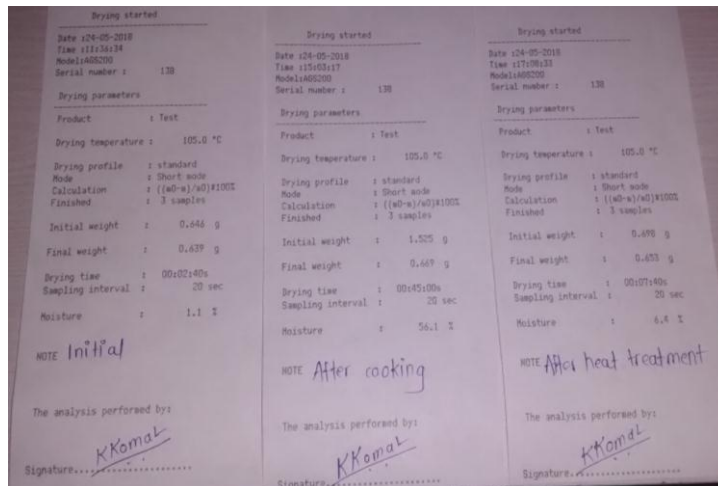
2.	After 60	775	380	47.8	Drying phase continue
3.	After 90	632	523	55.6	Variant of Drying rate
4.	After 120	540	615	57.9	Variant of Drying rate
5.	After 150	515	640	59	Required Drying rate

Sample weight after drying: 515 grams

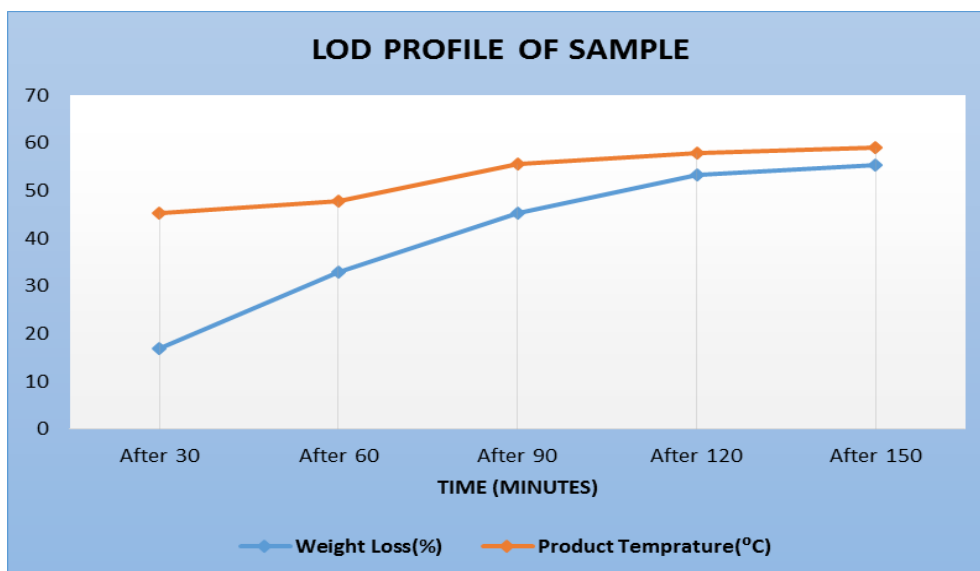
Total weight loss on drying: 640 grams

Final Moisture Content: 6.4%

MOISTURE ANALYSIS REPORTS:



GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:



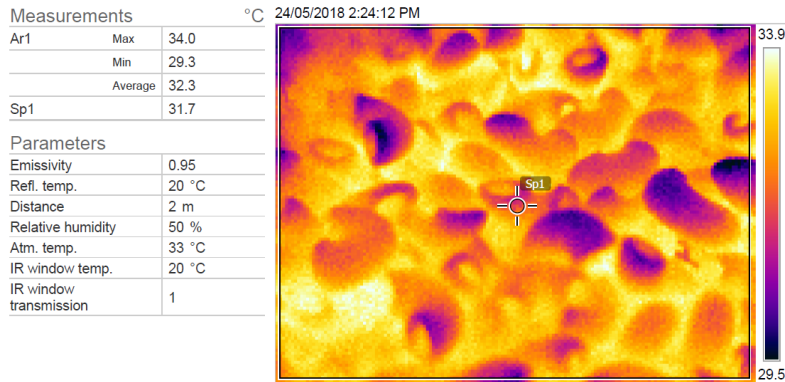
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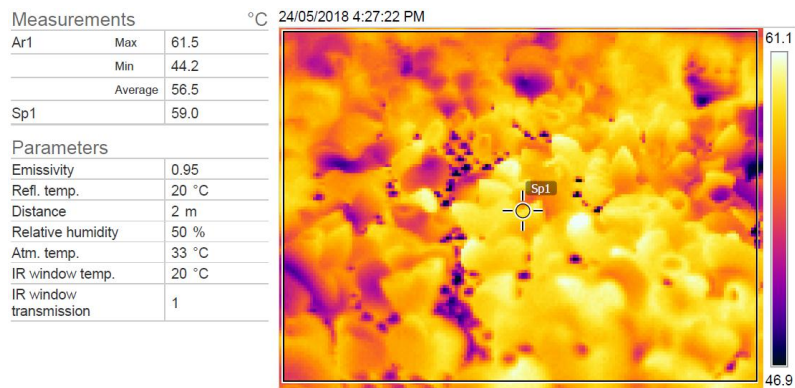
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THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. Before Heat Treatment:



2. After Heat Treatment:



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



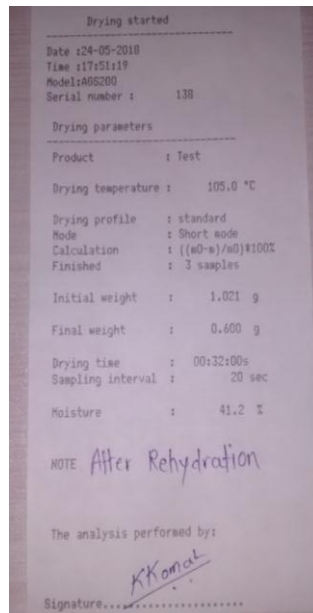
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REHYDRATION TEST:

For rehydration test, little amount of treated sample has been taken in a mug and then boiled water added to it and covered it for 3-5 minutes followed by stirring. Following are pictures of rehydration test sample and moisture analysis report of rehydrated sample.



PICTURES OF PASTA SIZE AFTER EVERY TREATMENT:



INITIAL
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**AFTER
COOKING**



FINAL



**AFTER
REHYDRATION**

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OBSERVATIONS:

The Drying behavior of cooked pasta has been investigated under the convection heating system. 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 in drying time. As per physical investigation, it has been observed that there is hardness in texture without burning and there is little colour change to reddish yellow.



Miss Komal Bhoite
Tested By

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