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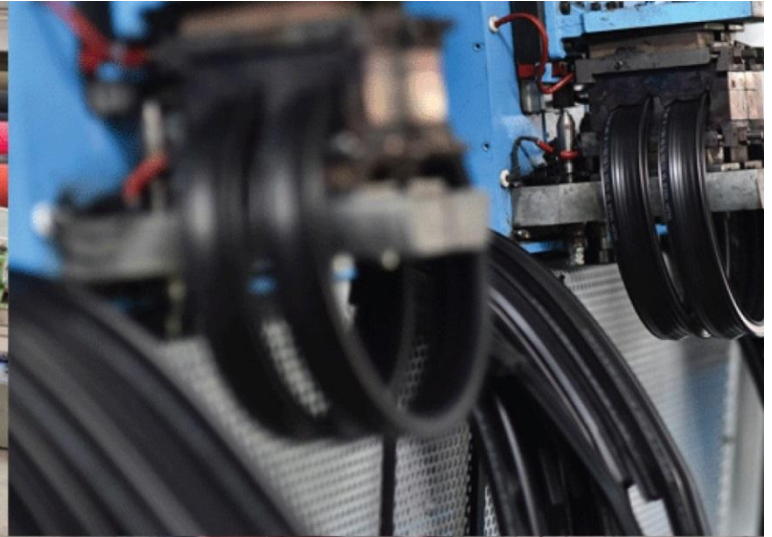
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In Association With



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 Drying of Semolina**



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Customer :	M/s. Alimento Agro Foods Pvt. Ltd., Kota
Process :	Batch Convection Heat Treatment for Drying of Semolina

TEST REPORT No: 47/KRDC/LAB/17 Mum 31/10/2018

Date Sample reception : 31/10/2018
ID : 47/LAB/63

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 10 kg
Sampling date : 31/10/2018
Product : Semolina
Requirement : Drying
Start Date test : 31/10/2018
End Date test : 01/11/2018

LABORATORY EXPERIMENTAL SET UP:



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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)	29.4°C (±5°C)
Humidity (%)	≤50% 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



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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)
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 semolina to speed up the drying rate. For this experimental run, boiling water has been added to raw semolina (semolina:water=1:2) and mixed well without any lumps and then immediately transferred to SS tray with uniform layer of about 10 mm for drying. Toppling has been given after every 30 minutes for uniform drying. Initial weight before drying, weight after adding water, final weight after drying, initial moisture content, moisture content after adding water and final moisture content has been taken.

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ANALYTICAL RESULTS:

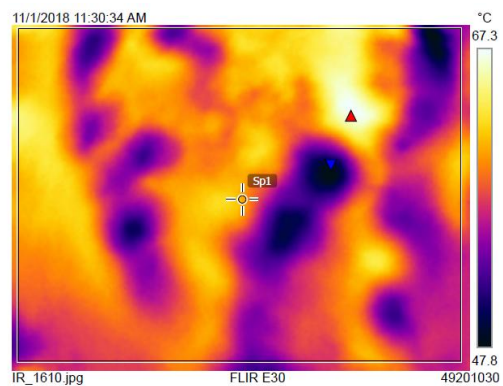
Initial weight (grams)	500
Weight after adding water (grams)	1460
Initial Moisture Content (%)	10.4
Moisture Content after adding water (%)	65.6
Setting Temperature(°C)	a) For initial 3 hours: 120°C b) After 3 hours: 80°C
Total Drying Time (hours)	4
Final weight (grams)	449
Final Moisture Content (%)	0.8

THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. Before Heat Treatment:

Measurements		
Bx1	Max	67.4 °C
	Min	47.4 °C
	Average	58.5 °C
Sp1		61.1 °C

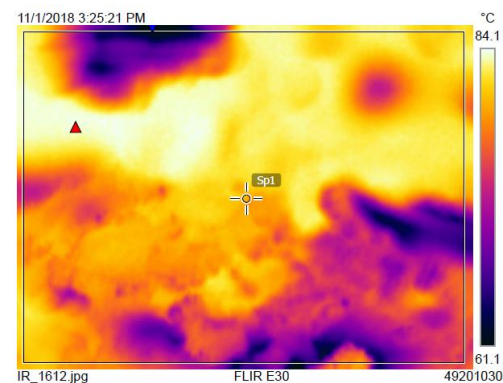
Parameters	
Emissivity	0.95
Refl. temp.	20 °C



2. After Heat Treatment:

Measurements		
Bx1	Max	84.0 °C
	Min	60.9 °C
	Average	78.1 °C
Sp1		80.1 °C

Parameters	
Emissivity	0.95
Refl. temp.	20 °C



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BEFORE AND AFTER PICTURES OF SPECIMEN SAMPLE:



Initial Raw Sample



After Adding
Boiling Water



Final Sample

MOISTURE ANALYSIS REPORTS:

Drying started		Drying started		Drying started	
Date : 1-11-2018	Time : 16:21:22	Date : 1-11-2018	Time : 12:13:09	Date : 1-11-2018	Time : 16:09:59
Model:AGS200	Serial number : 138	Model:AGS200	Serial number : 138	Model:AGS200	Serial number : 138
Drying parameters		Drying parameters		Drying parameters	
Product : Test	Drying temperature : 105.0 °C	Product : Test	Drying temperature : 105.0 °C	Product : Test	Drying temperature : 105.0 °C
Drying profile : standard	Mode : Short mode	Drying profile : standard	Mode : Short mode	Drying profile : standard	Mode : Short mode
Calculation : $((m0-m)/m0)*100\%$	Finished : 3 samples	Calculation : $((m0-m)/m0)*100\%$	Finished : 3 samples	Calculation : $((m0-m)/m0)*100\%$	Finished : 3 samples
Initial weight : 1.416 g	Final weight : 1.269 g	Initial weight : 1.195 g	Final weight : 0.411 g	Initial weight : 1.229 g	Final weight : 1.219 g
Drying time : 00:09:20s	Sampling interval : 20 sec	Drying time : 00:23:00s	Sampling interval : 20 sec	Drying time : 00:01:40s	Sampling interval : 20 sec
Moisture : 10.4 %		Moisture : 65.6 %		Moisture : 0.8 %	
NOTE Initial		NOTE After adding boiling water		NOTE After drying	
The analysis performed by: Signature: <u>K Komal</u>		The analysis performed by: Signature: <u>K Komal</u>		The analysis performed by: Signature: <u>K Komal</u>	

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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.



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OBSERVATIONS:

The Drying behavior of semolina 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 drying time. As per physical investigation, it has been observed that there is no change in colour after drying.

A handwritten signature in black ink that reads "K Komal".

Miss Komal Bhoite
Tested By