

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. Indian Products (P) Limited (Jayanti Group)
Process :	Batch Microwave Heat Treatment for Sterilization Of Spices

TEST REPORT No: 47/KRDC/LAB/17 Mum 18/06/2018

Date Sample reception : 18/06/2018
ID : 47/LAB/43

SAMPLE DESCRIPTION:

Sampling : As requested
Sample Condition : Acceptable
Quantity : 2 boxes
Sampling date : 21/06/2018
Product : Spices
Requirement : Sterilizing of given Spices
Start Date test : 21/06/2018
End Date test : 21/06/2018

LABORATORY EXPERIMENTAL SET UP:



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LAB BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:


Microwave Power	2 kW(CW)
Frequency	2450 MHz \pm 50
Convective Power	3.5 kW (air flow 350 l/min at 20°C)
Microwave Exposure Zone (cavity)	1 cubic meter
Mode Stirrer	One
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250°C
Exhaust Power	1HP
Tray Size	450x950x50 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	29°C (\pm 5°C)
Humidity (%)	\leq 80% 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
Infrared Contact Thermometer		Model: FLUKE 566 Temperature Range: -40°C to 650°C Display Resolution: 0.1°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 samples of different types of spices and herbs to speed up the drying rate for sterilization treatment. For this experimental run, after analyzing moisture content of every sample given spices has been seal packed in plastic bags and placed in batch microwave heating system for particular time period. The observations are made on the basis temperature on product after heating treatment and colour change in product.

ANALYTICAL RESULTS:

Sr. No.	Name of Spices	Initial Moisture Content (%)	Microwave Power (kW)	Time (minutes)	Surface Temperature (°C)
1.	Ginger Ground	6.8	1.8	2.5	76.3
			2		86.2
2.	Seasoning Salt	3.1	1.8	2.5	58.2
			2		67.4
3.	Papriko Chilly	6.7	1.8	2.5	73.7
			2		74.2

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4.	Turmeric Ground	7.1	1.8	2.5	77.3
			2		94.2
5.	Coriander Whole	5.9	1.8	2.5	73.2
			2		74.5

MOISTURE ANALYSIS REPORTS:

Drying started	Drying started	Drying started	Drying started	Drying started
Date :21-06-2018 Time :14:18:07 Model:AGS200 Serial number : 138	Date :21-06-2018 Time :14:18:14 Model:AGS200 Serial number : 138	Date :21-06-2018 Time :14:38:59 Model:AGS200 Serial number : 138	Date :21-06-2018 Time :14:45:27 Model:AGS200 Serial number : 138	Date :21-06-2018 Time :14:52:07 Model:AGS200 Serial number : 138
Product : Test	Product : Test	Product : Test	Product : Test	Product : Test
Drying temperature : 105.0 °C	Drying temperature : 105.0 °C	Drying temperature : 105.0 °C	Drying temperature : 105.0 °C	Drying temperature : 105.0 °C
Drying profile : standard Mode : Short mode Calculation : (([w]-w)/[w])x100% Finished : 3 samples	Drying profile : standard Mode : Short mode Calculation : (([w]-w)/[w])x100% Finished : 3 samples	Drying profile : standard Mode : Short mode Calculation : (([w]-w)/[w])x100% Finished : 3 samples	Drying profile : standard Mode : Short mode Calculation : (([w]-w)/[w])x100% Finished : 3 samples	Drying profile : standard Mode : Short mode Calculation : (([w]-w)/[w])x100% Finished : 3 samples
Initial weight : 0.922 g Final weight : 0.959 g	Initial weight : 2.195 g Final weight : 2.129 g	Initial weight : 1.015 g Final weight : 0.947 g	Initial weight : 1.077 g Final weight : 1.000 g	Initial weight : 1.200 g Final weight : 1.168 g
Drying time : 00:02:00s Sampling interval : 20 sec	Drying time : 00:02:20s Sampling interval : 20 sec	Drying time : 00:03:20s Sampling interval : 20 sec	Drying time : 00:04:40s Sampling interval : 20 sec	Drying time : 00:04:20s Sampling interval : 20 sec
Moisture : 6.8 %	Moisture : 3.1 %	Moisture : 6.7 %	Moisture : 7.1 %	Moisture : 5.9 %
NOTE Ginger ground.	NOTE Seasoning salt	NOTE Paprika chilly	NOTE Turmeric ground	NOTE Coriander whole
The analysis performed by: Signature: <i>K Komal</i>	The analysis performed by: Signature: <i>K Komal</i>	The analysis performed by: Signature: <i>K Komal</i>	The analysis performed by: Signature: <i>K Komal</i>	The analysis performed by: Signature: <i>K Komal</i>

OBSERVATIONS:

The Drying behavior of spices has been investigated under the microwave irradiation mode dryer for sterilization treatment. As per physical investigation, it has been observed that there is no colour change in any of the sample, no damage to plastic bag also.

K Komal

Miss. Komal Bhoite
Tested By

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