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

Customer:	**M/s. Yoga Bars, Bangalore**
Process:	**Microwave+Convection Heat Treatment for Drying of Nutritive bars**

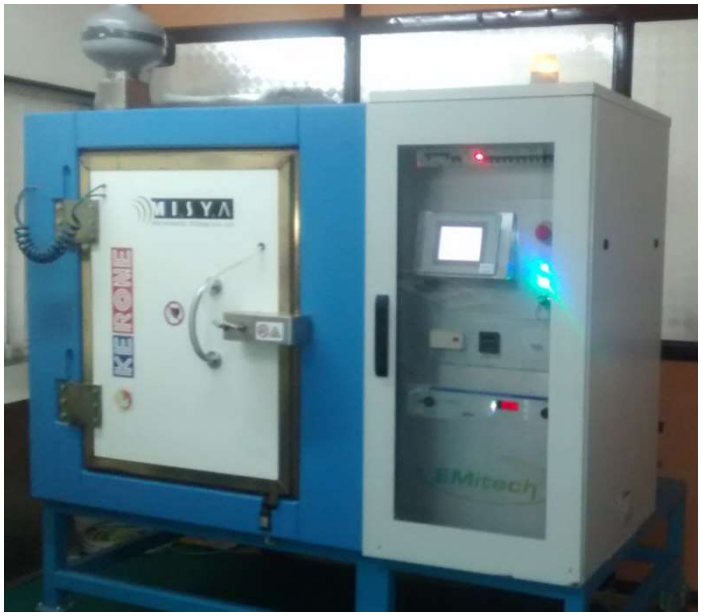
TEST REPORT No: 47/KRDC/LAB/17 Mum 05/04/2021

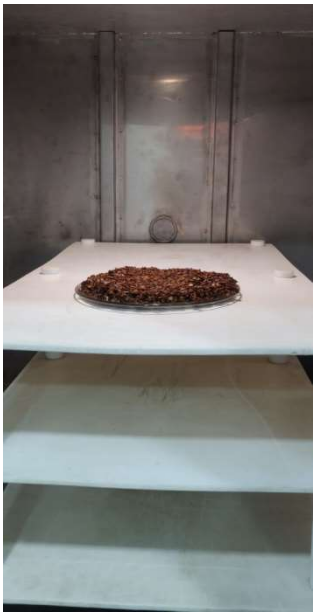
Date Sample reception : 05/04/2021
ID : 47/LAB/190

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 50 kg
Sampling date : 07/04/2021
Product : Raw samples for bar, date syrup and honey syrup with dehydrated fruits
Requirement : Baking and drying
Start Date test : 07/04/2021
End Date test : 07/04/2021

LABORATORY TRIAL EXPERIMENTAL SET UP:





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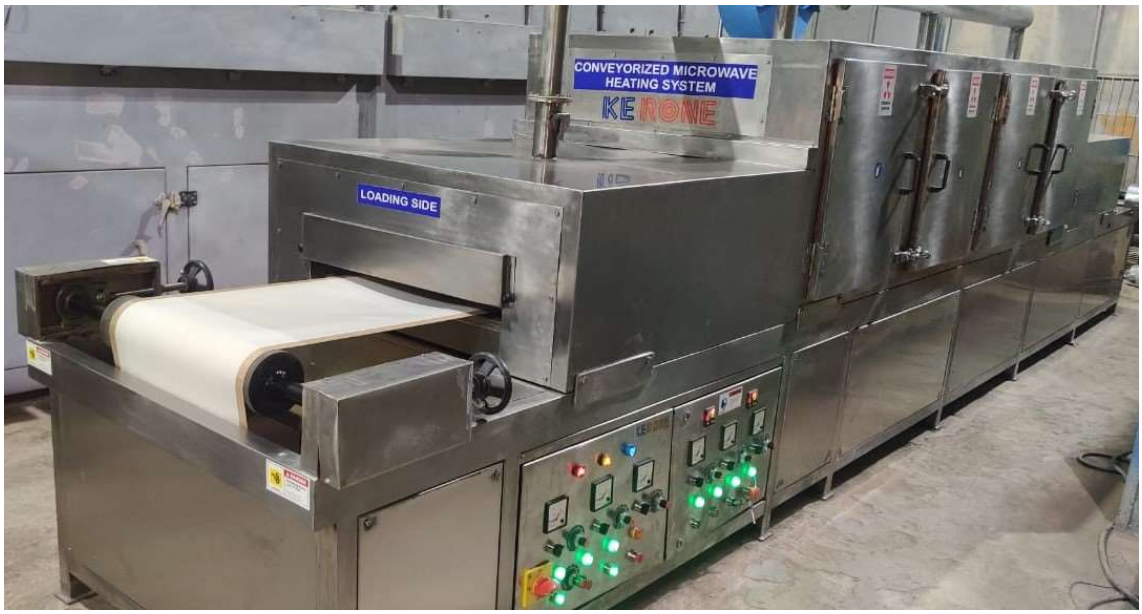

LAB BATCH MICROWAVE+CONVECTION HEATING SYSTEM SPECIFICATIONS:

Microwave Power	2 kW(CW)
Frequency	2450 MHz ± 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

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CONTINUOUS MICROWAVE+CONVECTION HEATING SYSTEM SPECIFICATIONS:

Microwave Power	8.7kW
Frequency	2450 ± 50 MHz
Convective Power	2.5 kW
Microwave Exposure Zone (Cavity)	3000 mm length wise
Product surface temp. range	Max. 120 deg cells
Conveyor width	500mm
Conveyor Speed	Variable 0.2 to 4MPM
Conveyor Motor Drive	1 HP AC Induction with VFD
Entry Vestibule length	1100mm
Exit Vestibule Length	1100 mm
Exhaust Power	1.5 HP

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	35°C (±5°C)
Humidity (%)	≤30% 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

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EQUIPMENTS USED:

Name of Equipment	Picture of Equipment	Specifications
Infrared Thermometer		**Model: FLUKE 566** **Temperature Range: -40°C to 650°C** **Display Resolution: 0.1°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: ± (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 given sample of chocolate granola bar and breakfast bar to speed up the drying rate for baking treatment. For this experimental run, given raw sample has been mixed uniformly with boiled syrup according to recipe and then rolled out as per required thickness. Finally these rolled sheets and bars have been placed in microwave heating system for baking and then observations are made on the basis of taste and texture.

ANALYTICAL RESULTS:

	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4
Machine Type	Batch	Continuous	Continuous	Continuous

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Sample Type	Chocolate Granola sheet	Chocolate Granola sheet	Chocolate Granola sheet	Breakfast Bar
Microwave Power (kW)	1.8	4	6	6
Setting Temperature (°C)	70	100	100	100
Exposure Time (minutes)	5	3.2	7	5
Temperature on Product (°C)	80-90	65-70	70-75	70-75
Initial moisture Content (%)	4-5	4-5	4-5	7-8
Final moisture Content (%)	1-1.5	2.5-3.5	0.8-1.2	3-4
Remarks, if any	Completely baked with required texture and taste	Partially baked	Completely baked with required texture and taste	Partially baked

BEFORE AND AFTER PICTURES OF TREATED SPCIMEN SAMPLE:

1. **Chocolate Granola Sheet:**

BEFORE

AFTER

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2. Breakfast Bar:

BEFORE

AFTER

OBSERVATIONS:

The drying and baking behavior of granola and breakfast bar sample has been investigated under the microwave irradiation mode dryer. As per physical investigation and taste, it has been observed that there is no overbaking in any of the sample and required taste and crunchiness has been achieved.

K Komal

Miss. Komal Bhoite
Tested By