KERONE

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Kerone Research & Development Centre (KRDC),
B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
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Batch Microwave Treatment For Sterilization of Flour

ISO 9001-2008 | ISO 9001-2015 | EMS 14001 | OHSAS 18001
In Association with SVCH-Technology, Moscow (Russia)

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Customer :	**M/s. B L Agro Industries Ltd.**
Process :	**Batch Microwave Treatment For Sterilization of Flour (Brand- Nourish)**

TEST REPORT No: 47/KRDC/LAB/45 Mum 06/10/2021

Date Sample reception : 05/10/2021
ID : 47/LAB/45

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 10kg (5kg each)
Samples opening date : 06/10/2021
Product : Flour
Start Date test : 06/10/2021
End Date test : 06/10/2021

LABORATORY EXPERIMENTAL SET UP:

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LAB BATCH MICROWAVE+CONVECTION HEATING SYSTEM SPECIFICATIONS:

Microwave Power	2 KW (CW)
Frequency	2450 MHz ± 50
Microwave Exposure Zone (Cavity)	1 Cubic meter
Mode Stirrer	One
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250°C
Exhaust Power	1 HP
Tray size (width*height*depth)	450*950*50 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (^oC)	27^oC ($\pm5^oC$)
Humidity (%)	≤72% 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
K-type Thermometer		**Model: TM902C** **Thermometer range: -50°C to 1300°C** **Resolution: 0.1°C, 1°C**
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 to speed up the sterilization of the given sample. For this experimental run, each sample is packed in a microwavable bag and then it is placed in MW chamber with selection of suitable parameters like time and Magnetron power rating. The product is packed in different sizes and observations are made after decided time period on the basis of change in product temperature and appearance.

ANALYTICAL RESULTS:

1) For Flour (NUTRITION MAKE):

Initial wt- 5kg

Bag Dimension- 47cm (L) x28cm (W) x5cm (T)

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No. of Cycle	Cycle Time	MW Power rating (KW)	Product Temperature	Remark
C1	3 min	1.2 KW	(38-42) °C	No colour change
C2	3 min	1.2 KW	(43-50) °C	No colour change

Total cycle time- 6 min

DURING STERILIZATION OF SPECIMEN SAMPLE:

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THERMAL ANALYSIS REPORTS:

After Trial 1:

2) For Flour (NUTRITION MAKE):

Initial wt- 2 kg (500 + 500 +500 +500)g

Bag Dimension- 30cm (L) x24.5cm (W) x0.6cm (T)

No. of Cycle	Cycle Time	MW Power rating (KW)	Product Temperature	Remark
C1	3 min	1.2 KW	(40-45) °C	No colour change

Total cycle time- 3 min

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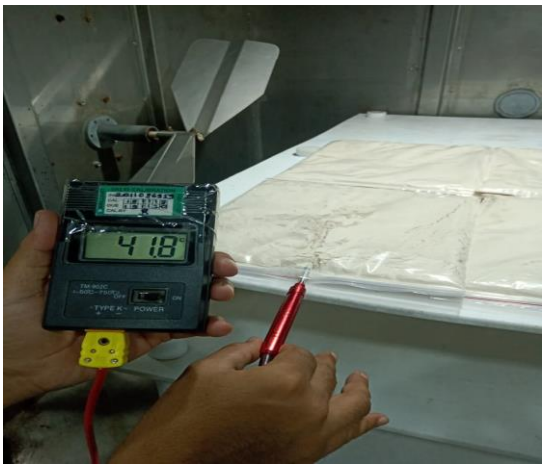
AFTER STERILIZATION OF SPECIMEN SAMPLE:

THERMAL ANALYSIS REPORTS:

After Trial 2:



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3) For Flour (NUTRITION MAKE):

Initial wt- 2 kg (500 + 500 +500 +500)g

Bag Dimension- 30cm (L) x24.5cm (W) x0.6cm (T)

No. of Cycle	Cycle Time	MW Power rating (KW)	Product Temperature	Remark
C1	2 min	1.5 KW	(42-48) °C	No colour change

Total cycle time- 2 min

AFTER STERILIZATION OF SPECIMEN SAMPLE:

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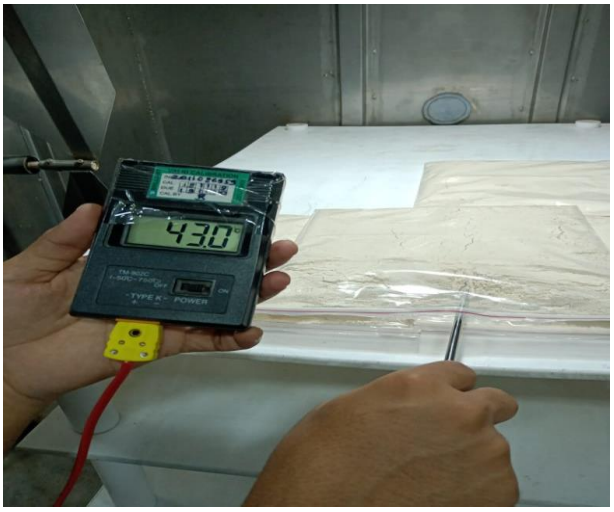
THERMAL ANALYSIS REPORTS:

After Trial 3:



OBSERVATION:

The heating behavior of flour has been investigated under the Batch Microwave Heating System for Sterilization purpose. The heating rate is found to be increasing with respect to increase in time. As per physical investigation, it has been observed that the colour of product does not change and the quality of bag remains desirably unaffected.

Ms. Komal Ingle

(Tested By)