



A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY

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AIMCAL (USA)



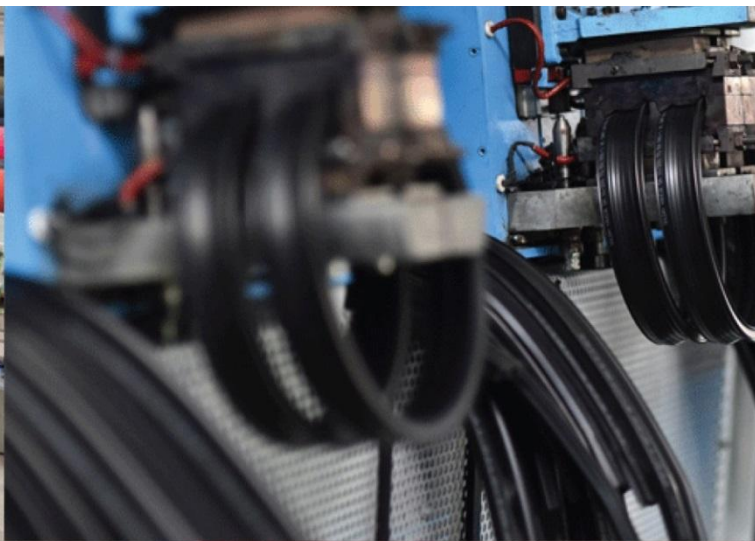
A.M.P.E.R.E (EUROPE)

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 Microwave+Convection Heat
Treatment for Sterilization of MBV and Offal
Powder**

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



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Customer :	M/s. Frigorifico Allana Private Ltd., Aurangabad
Process :	Batch Microwave+Convection Heat Treatment for Sterilization of MBV and Offal Powder

TEST REPORT No: 47/KRDC/LAB/17 Mum 27/09/2019

Date Sample reception : 27/09/2019
ID : 47/LAB/131

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 6 sealed packets
Sampling date : 27/09/2019
Product : MBV and Offal Powder
Requirement : Sterilization with 80-90°C product temperature
Start Date test : 27/09/2019
End Date test : 27/09/2019

LABORATORY EXPERIMENTAL SET UP:



Format: F/R&D/01



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LAB BATCH MICROWAVE+CONVECTION 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)	31°C (\pm 5°C)
Humidity (%)	\leq 79% 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: 160x 120IR Thermal sensitivity of 0.10°C
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: $\pm 1^\circ\text{C}$ (1.8°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: $\pm 5\%$ RH Humidity resolution: 1% RH

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on given MBV and Offal powder samples without adding any additive to speed up the drying rate for sterilization treatment. For this experimental run, sealed packet of given sample has been placed as it is in microwave heating system and treatment has been given. The observations are made for various parameters. Temperature on product after treatment has been noted.

ANALYTICAL RESULTS:

Trial No.	Powder Name	MW Power (kW)	Hot Air Temp (°C)	Cycle Time (minutes)	Product Temp (°C)	Remarks, if any
1.	MBV Powder	2	90	5	60-70	No physical change and no damage
2.		2	90	7	82-87	No physical change and no damage
3.		2	90	10	90-100	No physical change and no damage

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4.	Offal Powder	2	90	5	70-80	No physical change and no damage
5.		2	90	7	85-90	No physical change and no damage
6.		2	90	10	95-103	No physical change and no damage

THERMAL IMAGE SHOWING HIGHEST TEMPERATURE PROFILE:

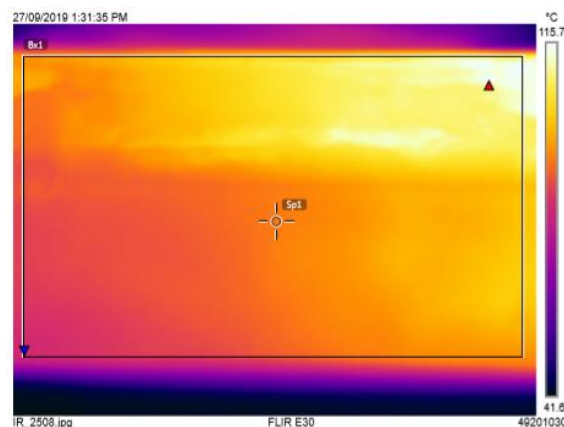
1. MBV Powder:

Measurements

Bx1	Max	116.9 °C
	Min	84.8 °C
	Average	97.8 °C
Sp1		94.4 °C

Parameters

Emissivity	0.95
Ref. temp.	20 °C



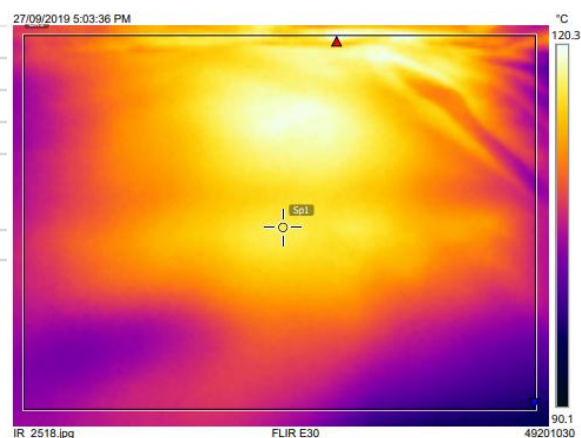
2. Offal Powder:

Measurements

Bx1	Max	112.6 °C
	Min	94.5 °C
	Average	103.5 °C
Sp1		101.7 °C

Parameters

Emissivity	0.95
Ref. temp.	20 °C



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BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:

1. MBV Powder:



2. Offal Powder:



OBSERVATIONS:

The Heating behavior of MBV and Offal powder has been investigated under the microwave+convection heating system for sterilization treatment. The heating rate is found to be increasing with respect to increasing heating time. As per physical investigation, it has been observed that there is no change in treated sample. Due to having high moisture content in Offal than MBV powder, it attains higher temperature than MBV.

Miss Komal Bhoite
Tested By

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