



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

Member Of



AIMCAL (USA)



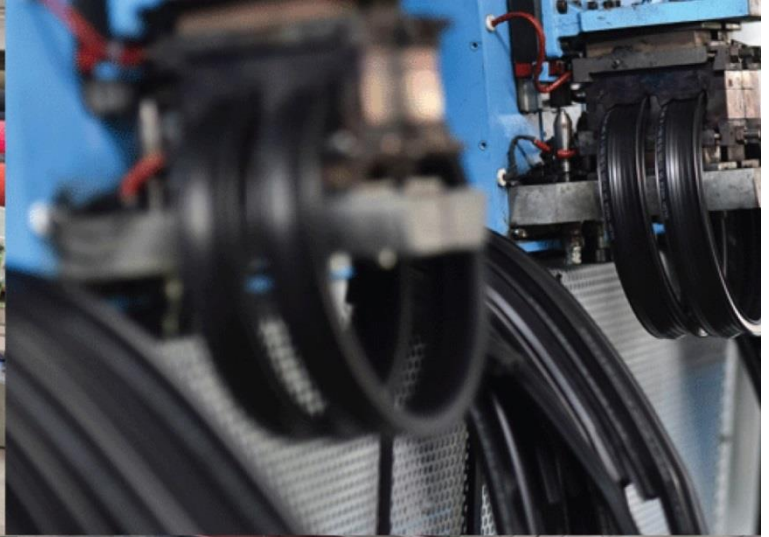
A.M.P.E.R.E (EUROPE)

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 Oats**

ISO 9001-2008 | ISO 9001-2015 | EMS 14001 | OHSAS 18001

In Association with SVCH-Technologii, Moscow (Russia)



ELECTRO MAGNETIC Innovative technologies



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

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

Customer :	Laboratory Experimental Analysis
Process :	Batch Microwave+Convection Heat Treatment for Sterilization of Oats

TEST REPORT No: 47/KRDC/LAB/17 Mum 06/12/2018

Date Sample reception : 06/12/2018
ID : 47/LAB/69

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 20 packets
Sampling date : 18/12/2018
Product : Oats
Requirement : Sterilization and disinfection of Oats
Start Date test : 18/12/2018
End Date test : 18/12/2018

LABORATORY EXPERIMENTAL SET UP:



Format: F/R&D/01

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.



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

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)	28.1°C (\pm 5°C)
Humidity (%)	\leq 64% 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



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°
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 oats samples without adding any additive to speed up the drying rate for sterilization treatment. For this experimental run, 1 kg oats has been sealed packed in bags and then microwave treatment has been given. The observations are made for various parameters. Surface temperature of packets has been taken.

ANALYTICAL RESULTS:

Sample A: Oats in gunny bag

Sample B: Oats in Final Packing

Trial No.	Power (kW)	Chamber Temp(°C)	Hot Air Temp(°C)	Cycle Time (minutes)	Product Temperature(°C)	
					Sample A	Sample B
1.	0.8	80	60	5	50	48
2.	1	80	60	3	47	45

Format: F/R&D/01

MEMBER OF A.M.P.E.R.E (EUROPE)
MEMBER OF AIMCAL (USA)

IN ASSOCIATION WITH EMitech, ITALY



ELECTRO MAGNETIC Innovative technologies



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

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

OBSRVATIONS:

The Drying behavior of oats has been investigated under the microwave+convection heating system for sterilization treatment. The drying rate is found to be increasing with respect to increasing drying time. As per physical investigation, it has been observed that there is no damage to bags.

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

**Miss Komal Bhoite
Tested By**

Format: F/R&D/01

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.