



# KERONE

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ISO-9001-2008 COMPANY



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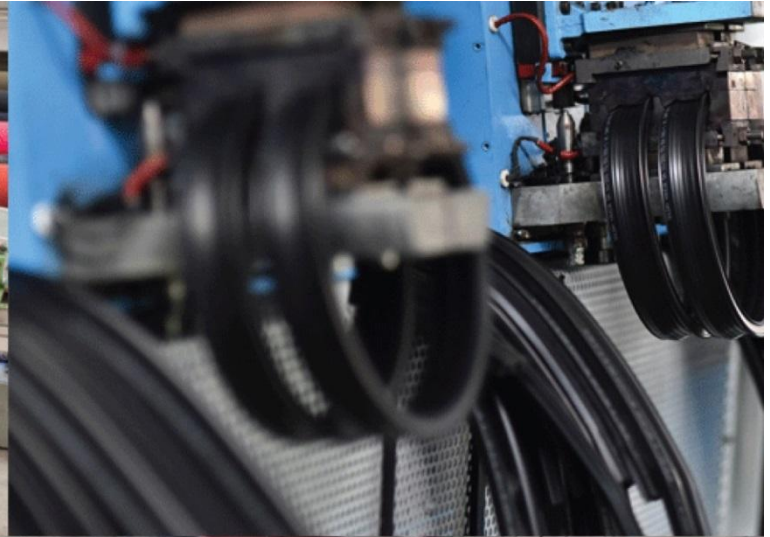
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In Association With



ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC),  
B/47, Addl. MIDC, Anand Nagar, Ambarnath (East), Thane- 421 506, India  
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**Batch Microwave Heat Treatment  
for Puffing of Instant Popcorn**

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



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Customer :	M/s. Koldpack Machineries Pvt. Ltd.
Process :	Batch Microwave Heat Treatment for Puffing of Corn to Popcorn

### TEST REPORT No: 47/KRDC/LAB/17 Mum 13/12/2019

Date Sample reception : 13/12/2019  
ID : 47/LAB/155

### SAMPLE DESCRIPTION:

Sampling : As Requested  
Sample Condition : Acceptable  
Quantity : 10 packets  
Sampling date : 31/12/2019  
Product : Instant Popcorn  
Requirement : Puffing in less time  
Start Date test : 31/12/2019  
End Date test : 31/12/2019

### LABORATORY EXPERIMENTAL SET UP:



Format: F/R&D/01



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#### LAB BATCH MICROWAVE+CONVECTION HEATING SYSTEM SPECIFICATIONS:

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

#### ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:



<b>Temperature (degree C)</b>	36°C ( $\pm$ 5°C)
<b>Humidity (%)</b>	$\leq$ 44% RH
<b>Pressure (kN/m<sup>2</sup> or kPa)</b>	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: $\pm^{\circ}\text{C}$ (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 instant popcorn packets to speed up the puffing rate. For this experiment, given sealed packet of instant popcorn has been placed in microwave heating system as per instructions written on the packet. The time required for complete puffing has been noted.

## ANALYTICAL RESULTS:

Microwave Power: 2 kW

Time required for complete puffing: 5 minutes



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#### BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



#### OBSRVATIONS:

The heating behavior of instant popcorn has been investigated under the Microwave Heating System. As per physical investigation, it has been observed that there is complete puffing of instant popcorn without any burning.

*K Komal*

Miss Komal Bhoite  
Tested By