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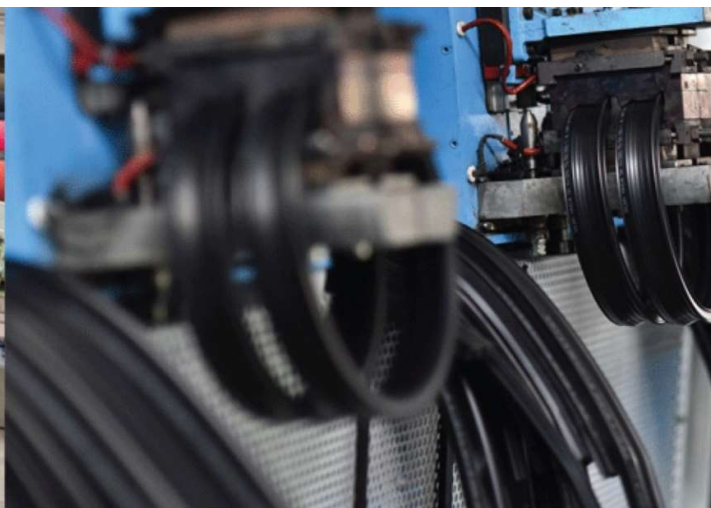
A.M.P.E.R.E (EUROPE)

In Association With



ELECTRO MAGNETIC Innovative Technologies

Kerone Research & Development Centre (KRDC),
B/47, Addl. MIDC. Anand Nagar, Ambernath (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 checking microwave transparency of HDPE
bag**

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



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| | |
|------------|---|
| Customer : | M/s. Anil & Company |
| Process : | Batch Microwave+Convection Heat Treatment for checking microwave transparency of HDPE bag |

TEST REPORT No: 47/KRDC/LAB/17 Mum 15/02/2021

Date Sample reception : 15/02/2021
ID : 47/LAB/186

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 2
Sampling date : 15/02/2021
Product : HDPE bags
Requirement : To check microwave transparency of HDPE bag.
Start Date test : 15/02/2021
End Date test : 15/02/2021

LABORATORY EXPERIMENTAL SET UP:



LAB BATCH MICROWAVE+CONVECTION HEATING SYSTEM SPECIFICATIONS:

| | |
|-----------------|----------|
| Microwave Power | 2 kW(CW) |
|-----------------|----------|

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.

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| | |
|---|---|
| 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) | 30.5°C (\pm 5°C) |
| Humidity (%) | \leq 39% 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 |
|-------------------|----------------------|----------------|
|-------------------|----------------------|----------------|

| | | |
|--------------------------------|---|--|
| Compact Thermal Imaging Camera |  | Model: FLIR E-30 Resolution: 160x 120 IR 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 sample of HDPE bag to speed up the drying rate. For this experimental run, given sample bag with some dummy load of wooden blocks has been placed in microwave heating system and microwave exposure has been given for a particular time period. The observations are made on the basis of temperature on bag and if there any damage to the bag.

ANALYTICAL RESULTS:

Microwave Power: 2 kW
Setting Temperature: 80°C
Cycle time: 8 minutes
Temperature on bag: 80-90°C

THERMAL IMAGE BEFORE AND AFTER HEAT TRAETMENT:



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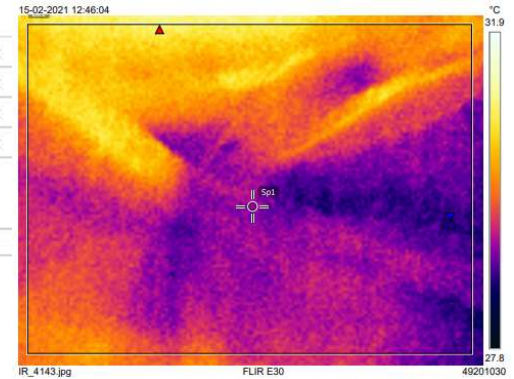
1. Before Heat Treatment:

Measurements

| | | |
|-----|---------|---------|
| Bx1 | Max | 31.2 °C |
| | Min | 28.4 °C |
| | Average | 29.5 °C |
| Sp1 | | 29.1 °C |

Parameters

| | |
|-------------|-------|
| Emissivity | 0.95 |
| Refl. temp. | 20 °C |



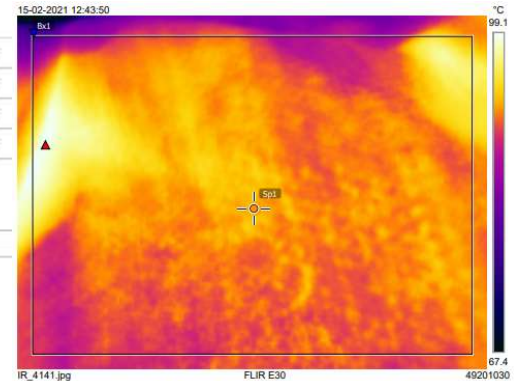
2. After Heat Treatment:

Measurements

| | | |
|-----|---------|---------|
| Bx1 | Max | 99.2 °C |
| | Min | 80.1 °C |
| | Average | 91.8 °C |
| Sp1 | | 91.8 °C |

Parameters

| | |
|-------------|-------|
| Emissivity | 0.95 |
| Refl. temp. | 20 °C |



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:

1. Before:





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2. After:



OBSRVATIONS:

The heating behavior of HDPE bag has been investigated under the microwave irradiation mode dryer. As per physical investigation, it has been observed that there is no damage to the bag with 80-90°C temperature on the product in bag open condition.

K Komal

Miss. Komal

Bhoite

Tested By