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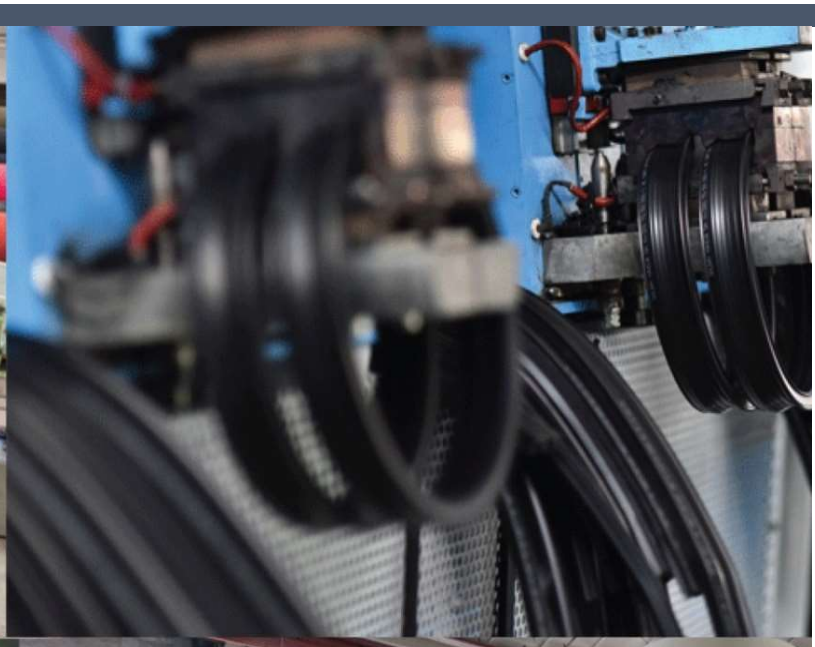
Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India

Tel- +91-251-2620542/13/44/45/46, Email-info@kerone.com, www.kerone.com



Continuous Infra-Red Heat Treatment for Drying of Multilayer Plastic

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Customer:	
Process :	**Continuous Rotary Infrared Heat Treatment for Drying of Multilayer plastic.**

Test Report No*: *239/KRDC/LAB/17 Mum 17/10/2023

Date Sample reception : 16/09/2023
ID : KRDC/R&D/23-24/17/10

***Sample Description*:**

Sampling : As Requested
Sample Condition : Acceptable
Sampling date : 16/10/2023
Product : Multilayer Plastic
Requirement : Final Moisture 0.05%
Start Date test : 16/10/2023
End Date test : 17/10/2023

Laboratory Experimental System -

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System Specifications –

IR Power	5 kW
Type of IR Emitters	Quartz Infrared
Rotary Drum Size	Φ324 mm x 800 mm long x 3mm Thick.
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250ºC
Exhaust	Exhaust port with manual damper
Air Circulation Fan	Radial Fan FHP 0.5HP

Laboratory's Environmental Conditions –

Temperature (degree C)	29.4ºC (±5ºC)
Humidity (%)	≤50% 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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Equipment 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: ±°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**
Moisture Analyzer		**Make: Axis Balance Description:** **Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g**
Analytical Balances LINB-A10		**Capacity : 100 g** **Minimum weighing : 0.0004 g** **Resolution : 0.0001 g** **Pan size : ⌀ 80 mm**

Procedure of the Experiment -

- The experiment was performed on Multilayer Plastic to speed up the heating rate.
- For this experimental run, the given sample was taken and then passed in the Continuous IR heating system with suitable parameters.
- After the heating treatment, the sample was analyzed.

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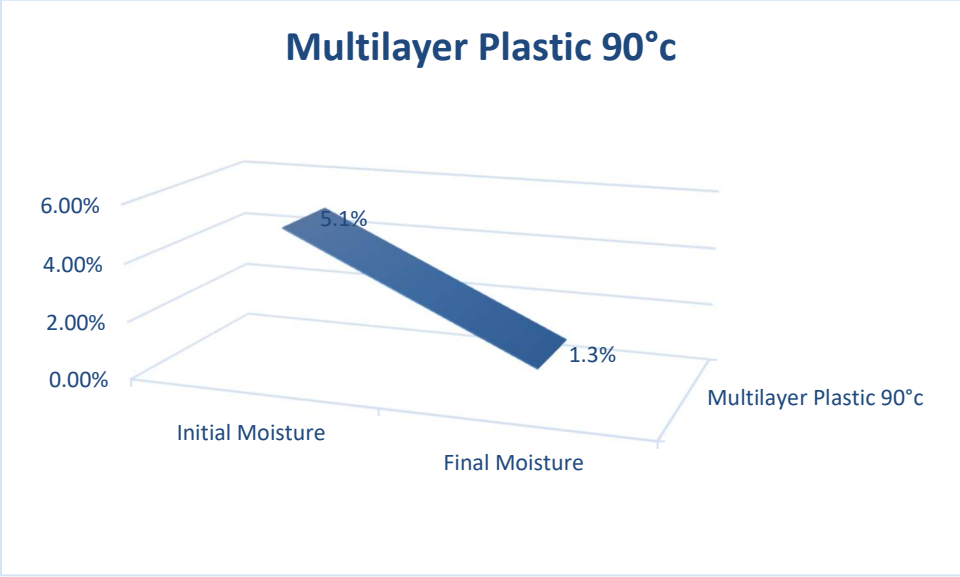
Analytical Results:

Trials	Cycle time	Initial weight	Initial Moisture	System Specifications	Final weight	Final Moisture	Remark
C1	30 minutes	500 gm	5.1%	Set temp:90˚C; Drum speed: 2.2.rpm	221gm	1.3%	Dried as desired

Time of one Drum Rotation: 06

GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:



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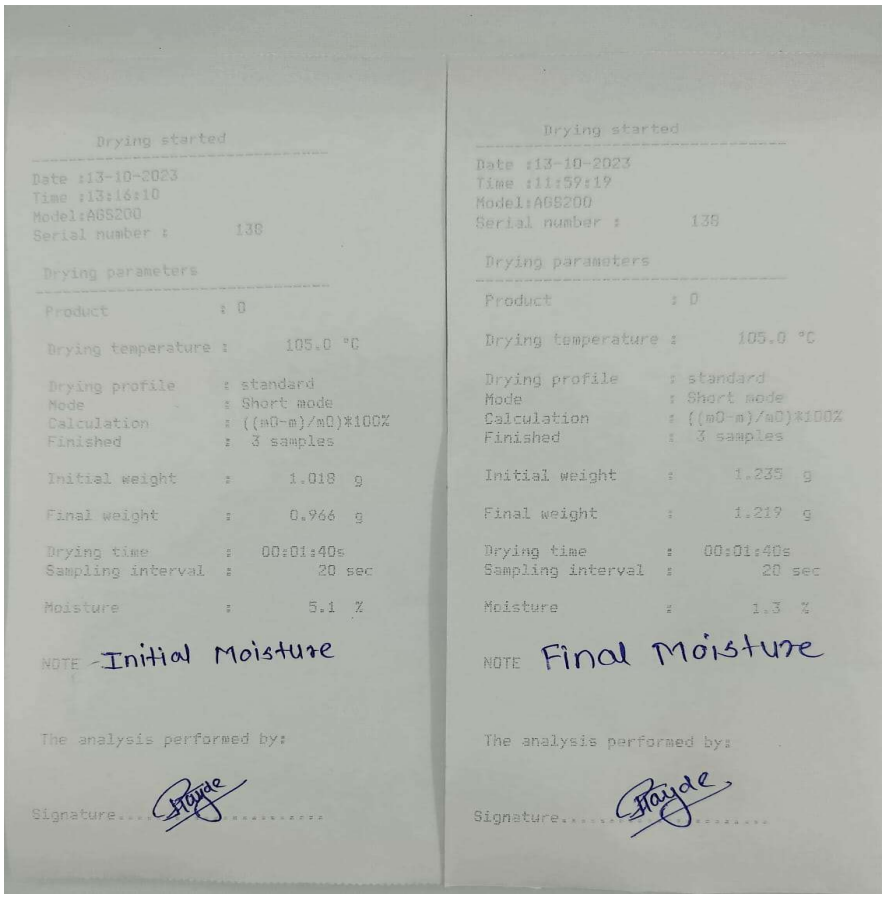
Before and After images:

Untreated Sample

Treated Sample

Moisture Analysis Report:



Drying started

Date :13-10-2023
Time :13:16:10
Model:AGS200
Serial number : 138

Drying parameters

Product : 0
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.018 g
Final weight : 0.966 g
Drying time : 00:01:40s
Sampling interval : 20 sec
Moisture : 5.1 %

NOTE - Initial Moisture

The analysis performed by:

Signature.....

Drying started

Date :13-10-2023
Time :11:59:19
Model:AGS200
Serial number : 138

Drying parameters

Product : 0
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.235 g
Final weight : 1.219 g
Drying time : 00:01:40s
Sampling interval : 20 sec
Moisture : 1.3 %

NOTE Final Moisture

The analysis performed by:

Signature.....

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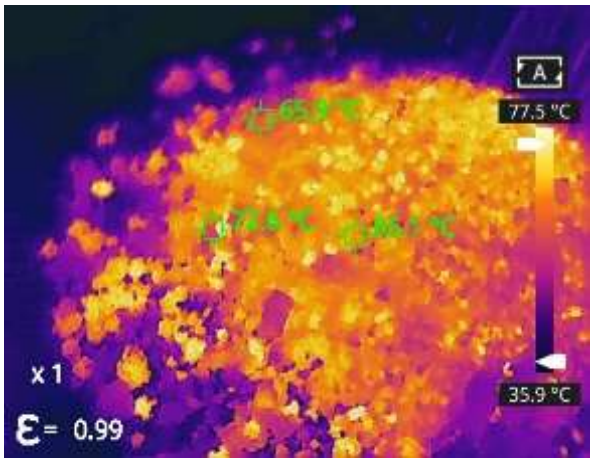
Thermal images:

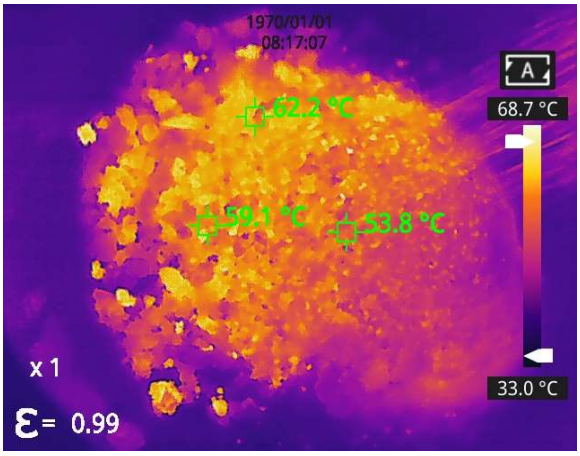
Measurements	
Sp1	65.9°C
Sp2	65.1°C
Sp3	72.6°C

Parameters	
Emissivity	0.99
Temp.	77.5°C



Measurements	
Sp1	62.2°C
Sp2	59.1°C
Sp3	53.8°C

Parameters	
Emissivity	0.99
Temp.	68.7°C



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Observations:

The drying behavior of Multilayer plastic has been investigated under the Rotary IR Heating System. The drying rate is increasing with respect to increasing drying time. It has been found that the moisture content on a dry basis (%) decreases with respect to increased drying time. As per the physical investigation, it has been observed that the loss of moisture after drying was observed without any cheering effect.

Mrs. Priya Tayde

(Tested By)