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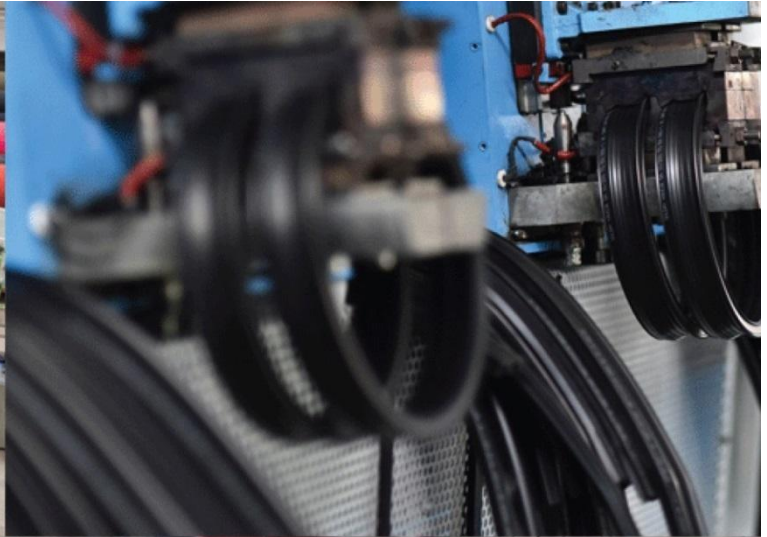
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In Association With



ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC),
B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com



**Batch Horizontal Convection Heat Treatment
of Acrylic Sheets for Malleability Test**



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Customer :	M/s. CREST INDUSTRIES
Process :	Batch Horizontal Convection Heat Treatment of Acrylic Sheets for Malleability Test.

TEST REPORT No: 78/KRDC/LAB/66 Mum 11/06/2022

Date Sample reception : 03/06/2022

ID : 78/LAB/11

SAMPLE DESCRIPTION:

Sampling : As Requested

Sample Condition : Acceptable

Samples opening date : 10/06/2022

Product : Acrylic Sheets

Start Date test : 10/06/2022

End Date test : 10/06/2022

LABORATORY EXPERIMENTAL SETUP:



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LAB BATCH CONVECTION HEATING SYSTEM SPECIFICATIONS:

Heating Zone (width*height*depth)	510*480*410 mm
No. of Heaters	6
Total Heater Power	6 kW
Motor	0.5 HP
No. of trays	6
Tray size (width*height*depth)	560 x 435 x25
Centrifugal Exhaust Blower	1440 rpm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:




Temperature (°C)	26°C (±5°C)
Humidity (%)	≤74% 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



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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
Moisture Analyzer		Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)
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

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SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on Acrylic Sheets to speed up its heating rate of the product. For this experimental run, the sample made ready for the trials by removal of protection paper and cleaning the leftover gum properly and then kept on cleaned SS tray. Later, it was placed in a Batch Horizontal Convection Oven with suitable set time and temperature profile. The on product temperature and its deformation was observed.



ANALYTICAL RESULTS:

Trial 1

Thickness: 10mm thick

Setting Temperature: 170°C

Cycle	Cycle Time (min.)	On product Temp. (°C)	Remarks, if any
C1	After 10 mints	(148-157)	Initiation of heating
C2	After 20 mints	(162-179)	Malleability achieved

Total Cycle time- 20 min.

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Trial 2

Thickness:15mm thick

Setting Temperature: 170°C

Cycle	Cycle Time (min.)	On product Temp. (°C)	Remarks, if any
C1	After 10 min.	(134-143)	Initiation of heating
C2	After 20 min.	(160-170)	Not easily deforming
C3	After 30 min.	(184-186)	Malleability achieved

Total Cycle time- 30 min.

Trial 3

Thickness:20mm thick

Setting Temperature: 170°C

Cycle	Cycle Time (min.)	On product Temp. (°C)	Remarks, if any
C1	After 10 min.	(148-157)	Initiation of heating
C2	After 20 min.	(158-177)	Not easily deforming
C3	After 30 min.	(175-191)	Malleability achieved

Total Cycle time- 30 min.

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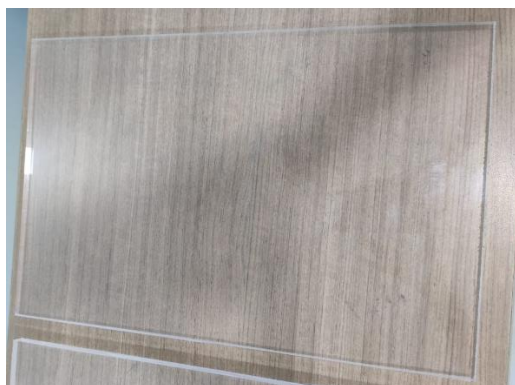
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MOLDING OF TREATED SPECIMEN SAMPLE:



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:

Trial 1



Untreated Sample



Treated Sample

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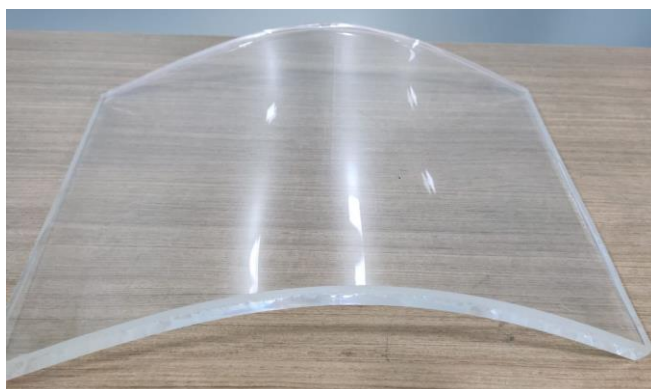


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Trial 2



Untreated Sample



Treated Sample

Trial 3



Untreated Sample



Treated Sample

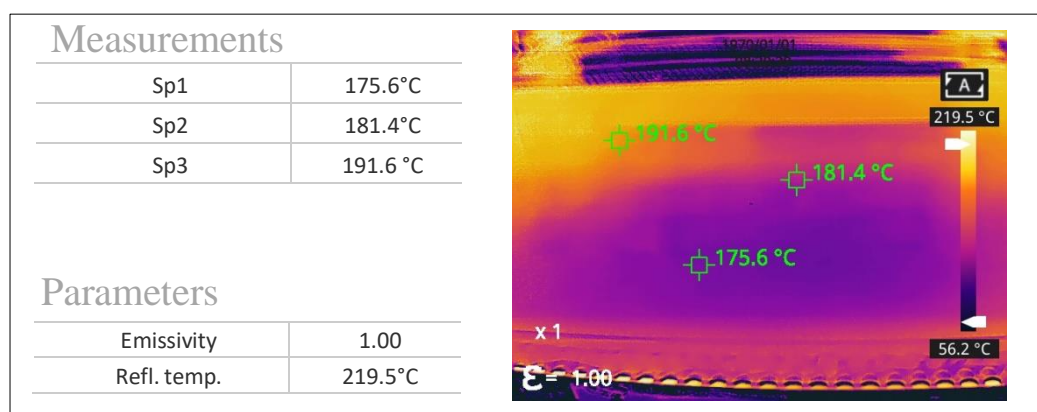
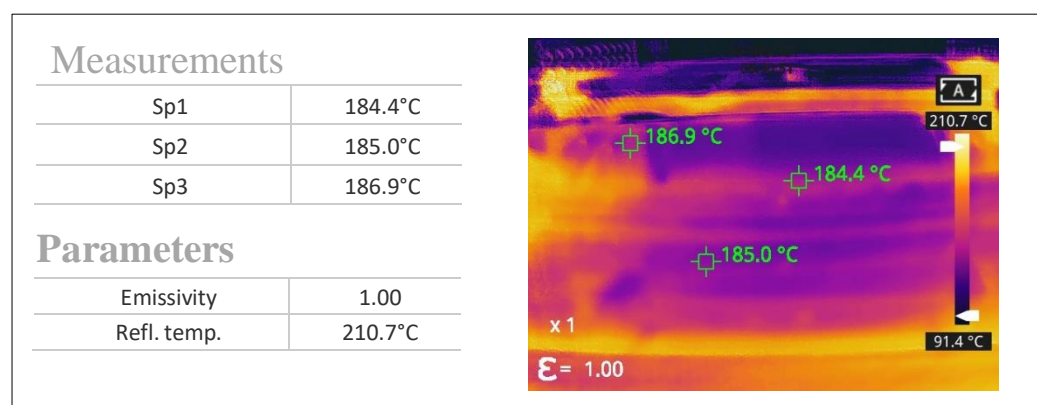
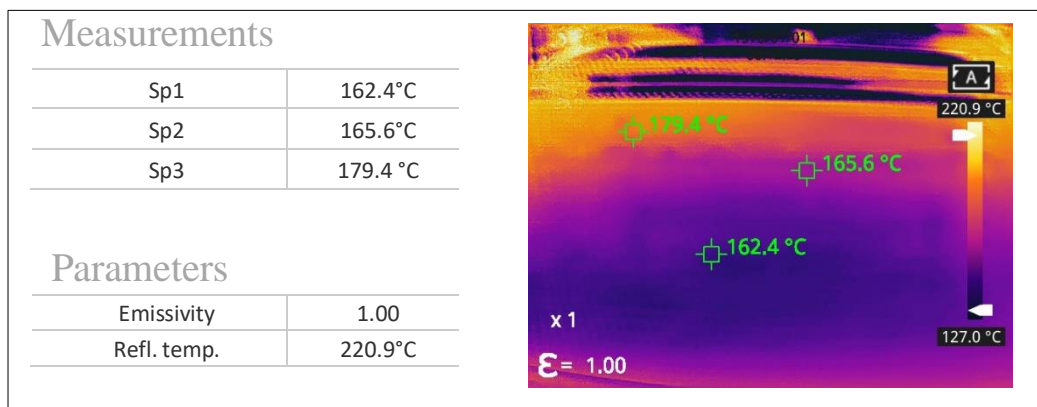
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THERMAL ANALYSIS REPORTS:



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OBSERVATIONS:

The heating behavior of Acrylic sheets has been investigated under the convection heating system. The heating Rate is found to be increasing with respect to increasing heating time. As per physical investigation, it has been observed, that the product of different thickness ranging from 10-20 mm are completely malleable and converted into curve shape by flopping the material on cylindrical surface after the treatment.

A handwritten signature in black ink, appearing to read "Sayali".

Ms. Sayali Asole
Tested By

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