KERONE

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Kerone Research & Development Centre (KRDC),
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Batch Convection Heat Treatment for Drying of Stainless Steel Pins

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

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Customer :	**M/s. USHA Precision Products Pvt. Ltd.**
Process :	**Batch Convection Heat Treatment for Drying of Stainless Steel Pins**

TEST REPORT No: 47/KRDC/LAB/17 Mum 16/10/2018

Date Sample reception : 16/10/2018
ID : 47/LAB/62

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 1 box
Sampling date : 17/10/2018
Product : Stainless Steel Pins
Requirement : Drying
Start Date test : 17/10/2018
End Date test : 17/10/2018

LABORATORY EXPERIMENTAL SET UP:

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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
Centrifugal Exhaust Blower	1440 rpm
No. of trays	6
Tray size (width*height*depth)	560*25*435 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	30.2^{o}C (±5^{o}C)
Humidity (%)	≤71% 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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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: ±°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

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on stainless steel pins to speed up the drying rate. For this experimental run, pins has been dipped in water for about 2 minutes and then immediately transferred to perforated tray for drying. Those pins on a tray has placed in a random manner with uniform thickness for achieving even drying characteristics and allowed for drying in batch convection heating system and time for drying has been noted.

ANALYTICAL RESULTS:

Initial Weight: 5 kg
Weight after removing from water: 5.107 kg
Setting Temperature: 140°C
Drying Time: 10 minutes
Final Weight after drying: 5 kg

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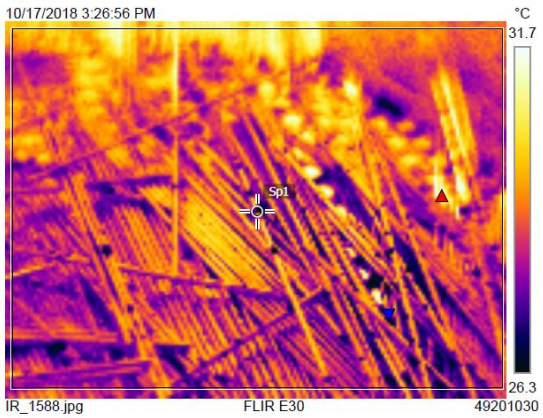
THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. **Before Heat Treatment:**

Measurements		
Bx1	Max	32.9 °C
	Min	26.1 °C
	Average	28.7 °C
Sp1		26.6 °C

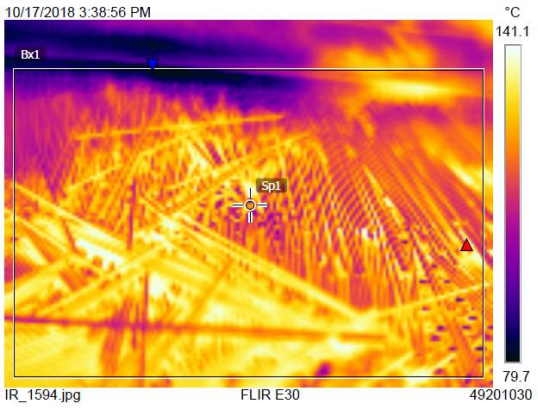
Parameters	
Emissivity	0.95
Refl. temp.	20 °C



2. **After Heat Treatment:**

Measurements		
Bx1	Max	142.8 °C
	Min	78.9 °C
	Average	123.1 °C
Sp1		127.7 °C

Parameters	
Emissivity	0.95
Refl. temp.	20 °C



OBSERVATIONS:

The Drying behavior of stainless steel has been investigated under the convection heating system. The drying rate is found to be increasing with respect to increasing drying time and temperature. It has been found that the time required to remove moisture on the pins decreases with respect to increase in temperature. As per physical investigation, it has been observed that there is no change in pins after drying.

K Komal

Miss Komal Bhoite
Tested By