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Customer :	Servotech India Ltd
Process :	Batch Convection Heat Treatment for Drying of Soya Wax Sheets

### TEST REPORT No: 47/KRDC/LAB/17 Mum 04/09/2020

Date Sample reception	: 04/09/2020
ID	: 47/LAB/179

## **SAMPLE DESCRIPTION:**

Sampling	: As Requested
Sample Condition	: Acceptable
Quantity	: 1 No.
Sampling date	: 04/09/2020
Product	: Soya Wax Sheets
Requirement	: Final Moisture should be less than 1%
Start Date test	: 04/09/2020
End Date test	: 05/09/2020

# LABORATORY EXPERIMENTAL SET UP:

1. Batch Convection Heating System:



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2. Batch Convection Heating System with Dehumidifier:





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## LAB BATCH CONVECTION HEATING SYSTEM SPECIFICATIONS:

1. Batch Convection Heating System:

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

2. Batch Convection Heating System with Dehumidifier:

Heating Zone (width*height*depth)	550*650*550 mm
No. of Heaters	4
Total Heater Power	3 kW
Motor	0.5 HP
No. of trays	7
Tray size	600500 X 35
(width*height*depth)	
Nominal Capacity of	1 tr each
Dehumidifier	
Humidity Range of	20-90%
Dehumidifier	

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Max. Ambient Temperature	40°C
of Dehumidifier	
Water Removal Rate of	80 lt per day at NTP
Dehumidifier	

# **ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:**

Temperature (°C)	31°C (±5°C)	
Humidity (%)	≤83% 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
Moisture Analyzer		Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)

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Thermo Hygrometer		Model No: HTC-2
	Transfer To The Top	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 soya wax sheet to speed up the drying rate. For this experimental run, 100\*100 mm size of sheet has been prepared having thickness of about 2 mm from given sample of soya wax. These sheets have been placed in two different heating systems for treatment and observations are made after every 1 hour on LOD basis.

## **ANALYTICAL RESULTS:**

1. Trial No. 1:

System: Batch Convection Heating System Setting Temperature: 80°C Initial Weight: 37 grams Drying Time: 6 hours Final Weight: 34 grams Weight loss: 8.1%

2. Trial No.2:

System: Batch Convection Heating System with Dehumidifier Setting Temperature: 100°C Initial Weight: 35grams Drying Time: 4 hours Final Weight: 33 grams Weight loss: 5.7%

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# THERMAL IMAGE BEFORE AND AFTER HEAT TRAETMENT:

1. Before Heat Treatment:

Bx1	Max	32.1 °C
	Min	30.7 °C
	Average	31.4 °C
Sp1		31.7 °C
Parameters		
Emissivity		0.95
Refl. temp.		20 °C



# 2. After Heat Treatment (Trial No.1):

#### Measurements

Bx1	Max	80.9 °C
	Min	71.5 °C
	Average	79.8 °C
Sp1		79.1 °C
Parameters		
Emissivity		0.95
Refl. temp.		20 °C



# 3. After Heat Treatment (Trial No.2):

Max	
Max	75.3 °C
Min	65.2 °C
Average	73.8 °C
	73.8 °C
	0.95
	20 °C
	Min Average



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# **BEFORE AND AFTER PICTURES OF TREATED SPCIMEN SAMPLE:**



BEFORE



AFTER

## **OBSERVATIONS:**

The drying behavior of Soya Wax Sheet has been investigated under the convection heating system. The drying rate is found to be increasing with respect to increase in time. As per physical investigation, it has been observed that there is no change in soya wax sheet after heat treatment, but it is taking very long time for weight loss.

Miss Komal Bhoite Tested By

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