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Kerone Research & Development Centre (KRDC),
B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India
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Batch Convection Heat Treatment for Drying of Liquid Solutions

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

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Customer :	**M/s. Raychem RPG Pvt. Ltd. Vasai**
Process :	**Batch Convection Heat Treatment for Drying of Liquid Solutions**

TEST REPORT No: 47/KRDC/LAB/17 Mum 06/07/2019

Date Sample reception : 06/07/2019
ID : 47/LAB/119

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 2 bottles
Sampling date : 06/07/2019
Product : Latex and Coagulant
Requirement : Final product must have least moisture content
Start Date test : 06/07/2019
End Date test : 06/07/2019

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
Vacuum Blower	0.85kW
No. of trays	6
Tray size (width*height*depth)	560*25*435 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	29°C (±5°C)
Humidity (%)	≤88% 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
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

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on given solutions without adding any additive to speed up the drying rate. For this experimental run, the given solution has been placed in SS tray and heat treatment has been given to achieve drying characteristics. Observations are made after every 15 minutes by checking the weight loss on drying. Also, initial weight before drying, initial moisture content, final weight and final moisture content after drying has been taken.

ANALYTICAL RESULTS:

1. **Latex:**
   Setting Temperature: 200°C
   Initial Moisture Content: 41.4 %
   Initial Weight: 67 grams

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Sr. No.	Time (minutes)	Weight noted (grams)	Total weight loss (%)	Temperature on sample(°C)	Remarks, if any
1.	After 15	37	44.77	175-180	Drying rate started
2.	After 30	37	44.77	175-180	Drying phase continue
3.	After 45	36	46.27	180-190	Variant of Drying rate
4.	After 60	35	47.76	190-200	Required Drying rate

Sample weight after drying: 35grams
Total weight loss on drying: 47.76%
Final Moisture Content: 0.8%

2. **Coagulant:**
   Setting Temperature: 200°C
   Initial Moisture Content: 57.6 %
   Initial Weight: 103 grams

Sr. No.	Time (minutes)	Weight noted (grams)	Total weight loss (%)	Temperature on sample(°C)	Remarks, if any
1.	After 15	40	61.16	180-200	Drying rate started
2.	After 30	40	61.16	180-200	Drying phase continue
3.	After 45	40	61.16	180-200	Required Drying rate

Sample weight after drying: 40 grams
Total weight loss on drying: 61.16%
Final Moisture Content: 2.8%

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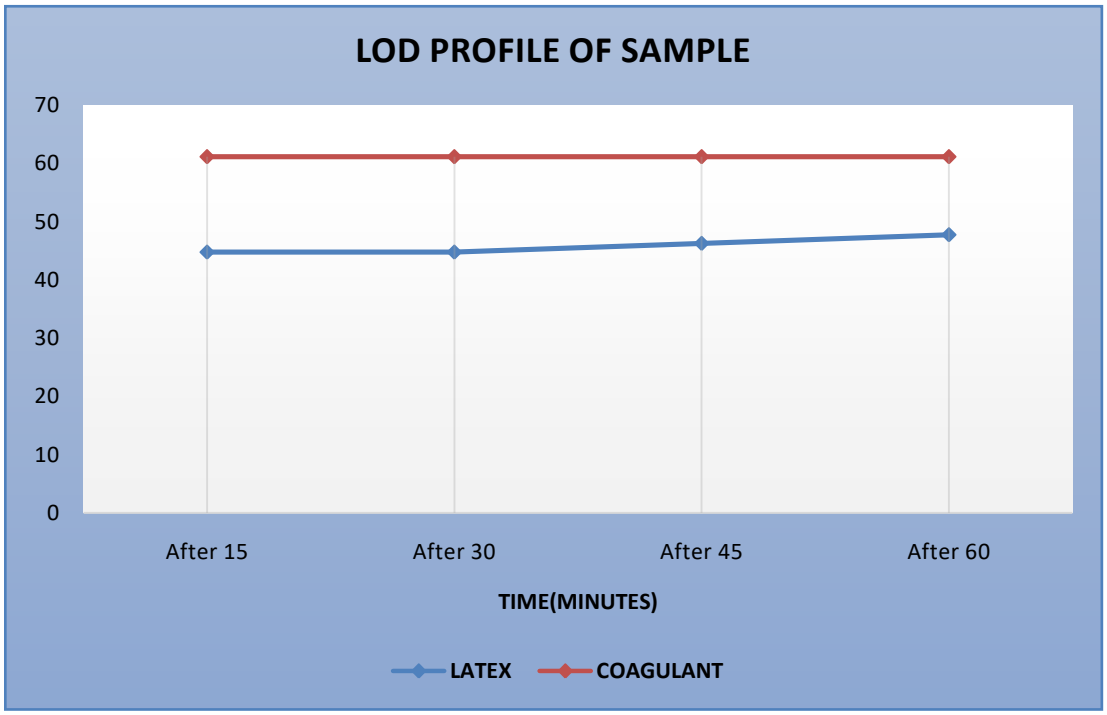
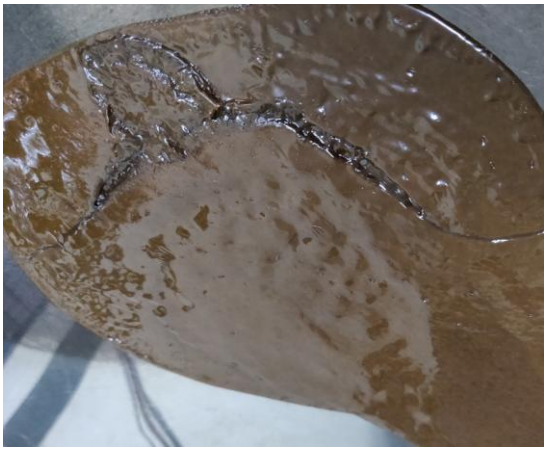
GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:



BEFORE AND AFTER PICTURES OF TREATED SPCIMEN SAMPLE:

1. **Latex:**



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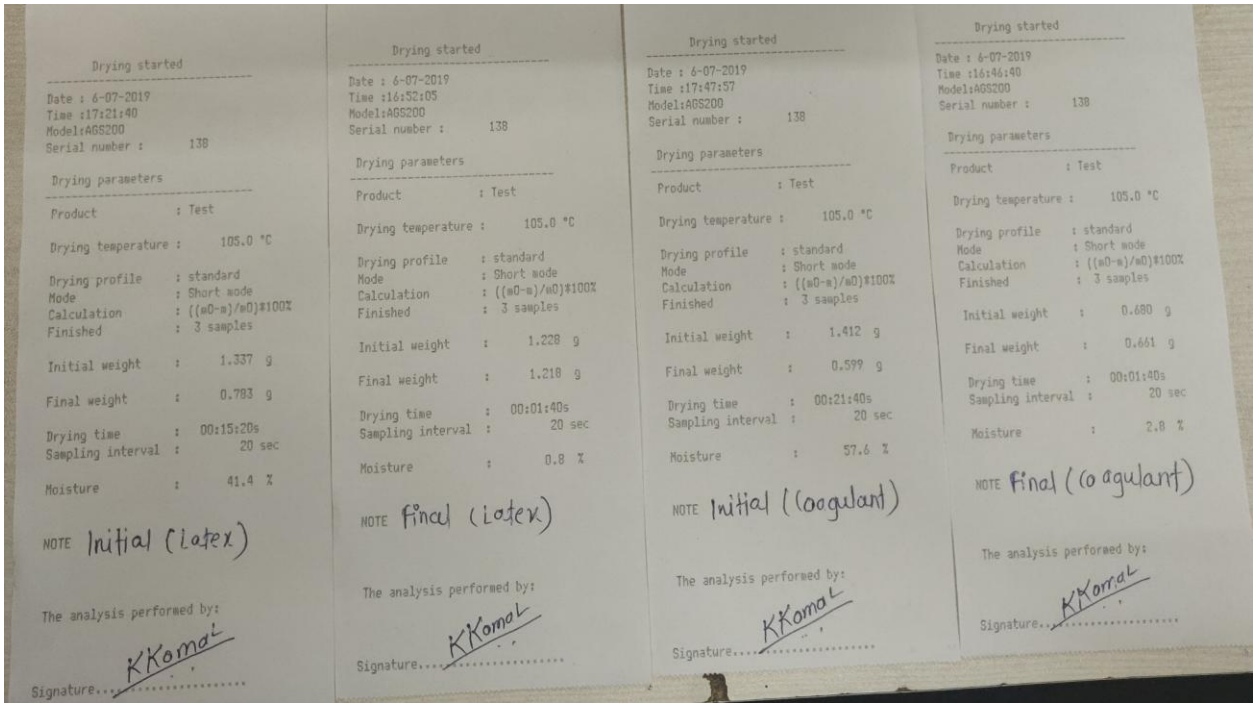
2. Coagulant:

MOISTURE ANALYSIS REPORTS:



Drying started
Date : 6-07-2019
Time :17:21:40
Model:AGS200
Serial number : 138
Drying parameters
Product : Test
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.337 g
Final weight : 0.783 g
Drying time : 00:15:20s
Sampling interval : 20 sec
Moisture : 41.4 %
NOTE Initial (Latex)
The analysis performed by:
Signature... KKomal

Drying started
Date : 6-07-2019
Time :16:52:05
Model:AGS200
Serial number : 138
Drying parameters
Product : Test
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.228 g
Final weight : 1.218 g
Drying time : 00:01:40s
Sampling interval : 20 sec
Moisture : 0.8 %
NOTE Final (Latex)
The analysis performed by:
Signature... KKomal

Drying started
Date : 6-07-2019
Time :17:47:57
Model:AGS200
Serial number : 138
Drying parameters
Product : Test
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.412 g
Final weight : 0.599 g
Drying time : 00:21:40s
Sampling interval : 20 sec
Moisture : 57.6 %
NOTE Initial (Coagulant)
The analysis performed by:
Signature... KKomal

Drying started
Date : 6-07-2019
Time :16:46:40
Model:AGS200
Serial number : 138
Drying parameters
Product : Test
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 0.680 g
Final weight : 0.661 g
Drying time : 00:01:40s
Sampling interval : 20 sec
Moisture : 2.8 %
NOTE Final (Coagulant)
The analysis performed by:
Signature... KKomal

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OBSERVATIONS:

The drying behavior of Latex and Coagulant has been investigated under the batch convection heating system. The drying rate is found to be increasing with respect to increasing drying time. It has been found that the moisture content on the dry basis (%) decreases with respect to increase in drying time. As per physical investigation, it has been observed that there is change in form of both the solutions from liquid to solid with a drastic colour change. In case of latex, final product is sticky while in case of coagulant final product is like a powder form.

Miss Komal Bhoite
Tested By