

Kerone Research & Development Centre (KRDC), B/47, Addl. MIDC. Anand Nagar, Ambarnath (East), Thane- 421 506, India
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Customer :	M/s. Cadila Healthcare Ltd, Ahemdabad, Gujarat
Process :	Continuous Infrared Heat Treatment for Drying of AMLO-4 solid material

TEST REPORT No: 47/KRDC/LAB/17 Mum 10/05/2018

Date Sample reception : 10/05/2018
ID : 47/LAB/34

SAMPLE DESCRIPTION:

Sampling : As requested
Sample Condition : Acceptable
Quantity : 1 kg
Sampling date : 16/05/2018
Product : AMLO-4 solid
Requirement : Final moisture content should be less than 1 %
Start Date test : 16/05/2018
End Date test : 16/05/2018

LABORATORY EXPERIMENTAL SET UP:



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LAB CONTINUOUS INFRARED HEATING SYSTEM SPECIFICATIONS:

IR Medium Wave Emitters	6 Nos -each having 0.5 kW, 445 mm heating length)
Short Wave IR Emitter with special reflectors	6 Nos (-each having 1 kW, 406 mm heating length)
IR Emitter to Object Distance	120 mm (- in medium wave zone)
IR Emitter to Object Distance	100 mm (- in short wave zone)
Overall IR Heating Zone length	1400 mm
Web width	400 mm
IR wavelength range	0.7 to 10 microns
Direct Exposure of MW IR	500 mm
Direct Exposure of SW IR	750mm
Temperature Range	0-400°C

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	31.5°C (±5°C)
Humidity (%)	≤ 60% 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: 160 x 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 AMLO-4 solid material without adding any additive to speed up the drying rate. For this experimental run, some amount of sample was taken and placed it on a SS tray with uniform layer of thickness about 5 mm and allowed for infrared heating treatment. Treated sample has been collected after 1 hour, 2 hours and 3 hours. Percentage weight loss after drying has been taken.

NOTE: As Moisture Analyzer(described above in equipments used) we are using is unable to detect moisture content in the given sample, we are sending the samples treated for various time period for your reference and for moisture analysis at your end using your Karl Fischer moisture meter.

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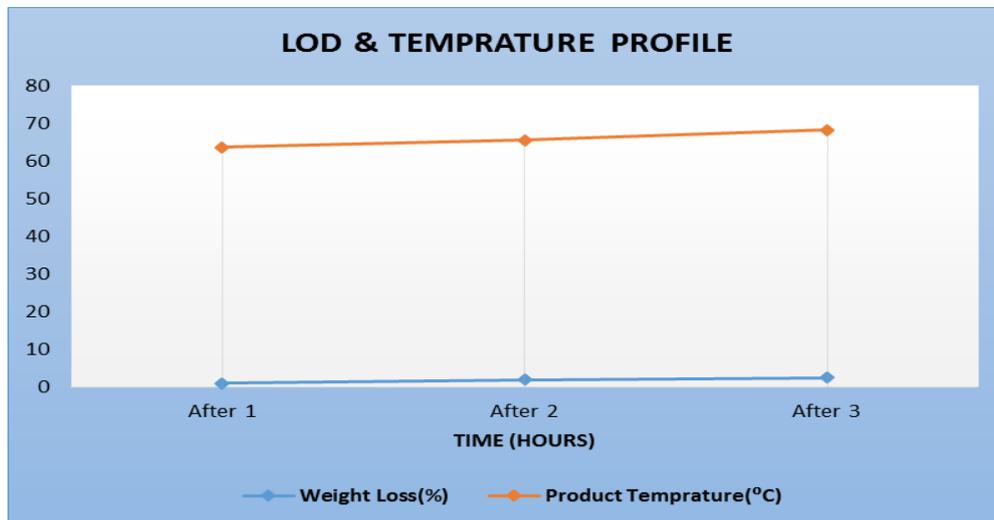
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ANALYTICAL RESULTS:

Setting Temperature: 70°C

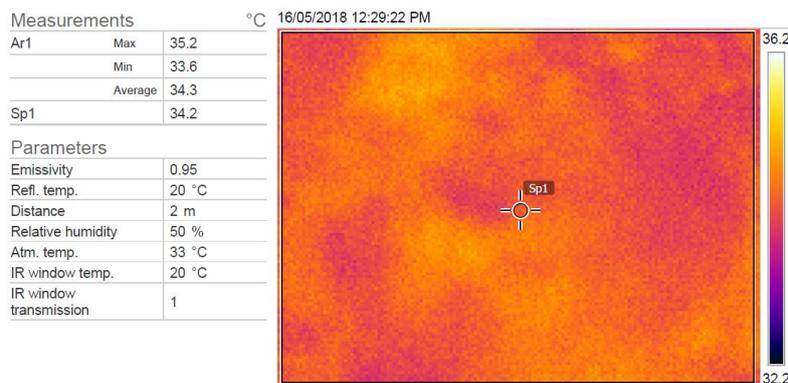
Sr. No.	Time (hours)	Weight loss (%)	Temperature on sample(°C)	Remarks, if any
1.	After 1	1	63.7	Drying rate started
2.	After 2	1.9	65.5	Drying phase continue
3.	After 3	2.5	68.2	Variant of Drying rate

GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:



THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. Before Heat Treatment

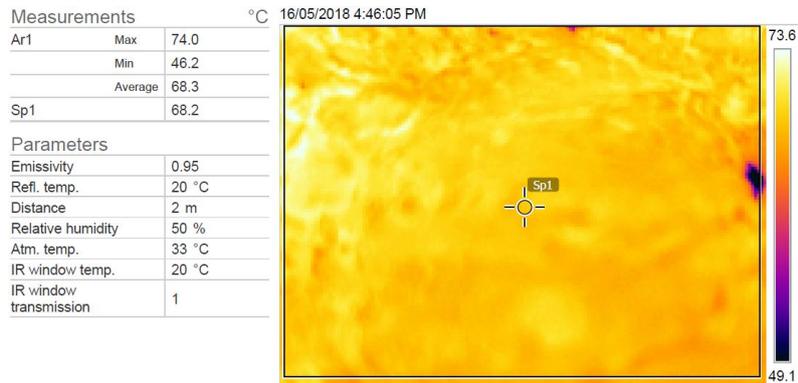


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2. After Heat Treatment:



BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



OBSERVATIONS:

The Drying behavior of AMLO-4 solid powder has been investigated under the continuous infrared mode dryer. The drying rate is found to be decreasing with respect to increasing drying time. It has been found that the percentage weight loss on the dry basis (%) decreases with respect to increase drying time. As per physical investigation, it has been observed that there is no colour change and free flowing texture in the processed sample.



Miss Komal Bhoite
Tested By

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