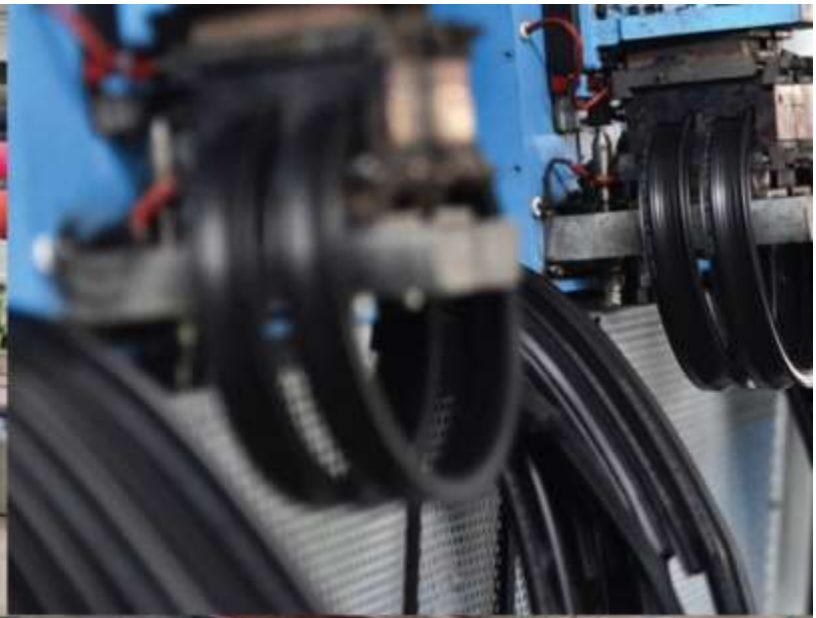


Kerone Research & Development Centre (KRDC)
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**Spray Drying Heat Treatment of
Tomato Slurry**



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Customer :	M/s. Jin Mata Food Processors LLP
Process :	Spray Drying Heat Treatment of Tomato Slurry

Test Report No: 218/KRDC/LAB/17 Mum 12/06/2023

Date Sample reception : 08/06/2023
ID : KRDC/R&D/23-24/06/12

Sample Description:

Sampling : As Requested
Sample Condition : Acceptable
Sampling date : 12/12/2023
Product : Tomato Slurry
Start Date test : 12/05/2023
End Date test : 12/05/2023

Laboratory Experimental System –





ELECTRO & MAGNETIC Instruments S.p.A. (Italy)







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Equipment Used -

Name of Equipment	Picture of Equipment	Specifications
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: $\pm^{\circ}\text{C}$ (1.8°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: $\pm 5\%$ RH Humidity resolution: 1% RH
Moisture Analyzer		Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)
Analytical Weighing Balance		Make: AVI Max: 200g Min: 40mg Class: II e: 2mg d: 0.001g Sr. No.: 2324003
Viscosity Apparatus		Manual flow meter in terms of time I.S. No.: 39944 Cup: B4

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ELABORAZIONE E CALIBRAZIONE Strumenti e Sistemi di Misura



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Digital Karl Fisher titration apparatus		Make: DBK Sr. No.: 220789 Type: 10KFT04 Volts: 230V ~
Weighing Balance		Make: Gill Description: ISO 9001: 2008 Model- PEWT – X Max- 10/20 Kg Min- 20g e. 1/2 g
Bulk Density Apparatus		Make: AVI Model No.: AVI-83 Sr. No.: 2324003
Thermal Imaging Camera		Model: FLIR E-30 Resolution: 160 x 120 IR Thermal sensitivity of 0.10°C



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System Specification -

Drying chamber Installed Power	4.5 KW
Drying chamber Heat Load	250°C maximum
Pneumatic Air Pressure	6 bar
Dosing pump	6-7 rpm min.

Laboratory's Environmental Conditions –

Temperature (degree C)	29.4°C (±5°C)
Humidity (%)	≤50% 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

Procedure of the Experiment -

- The experiment was performed on Tomato Slurry to speed up the heating rate.
- For this experimental run, the solution was passed through the dosing pump at a particular rpm into the heating chamber.
- The drying of the sample was achieved by monitoring and controlling parameters like temperature, feed pump, compressed air pressure, etc.
- The dried sample was collected from the cyclone and analyzed.



ELNCTRO S UAGHETTO Jorowebber Soc/consigliere



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Analytical Results:

Trial 2 –

Initial Sample Quantity – 500 ml

Heater Temperature (°C)	Flow time in B4 Cup (sec)	Chamber Temperature(°C)	Karl Fisher titration Value	Cycle Mode	Dosing Pump (rpm)	Remark
180°C	30	(150-160)°C	1.29ml	Continuous	10 Flow rate- 15ml/min	Sample recovered as observed

Final sample recovered – 76g

Final Moisture by LOD– 3.5%

Final Moisture by Karl Fisher Titration– 3.2%

Bulk Density of the recovered sample- 0.005 kg/cm3

Karl Fisher Titration Value:



Images during Trials:



Untreated Sample



Seeds separated out from slurry



Treated Sample

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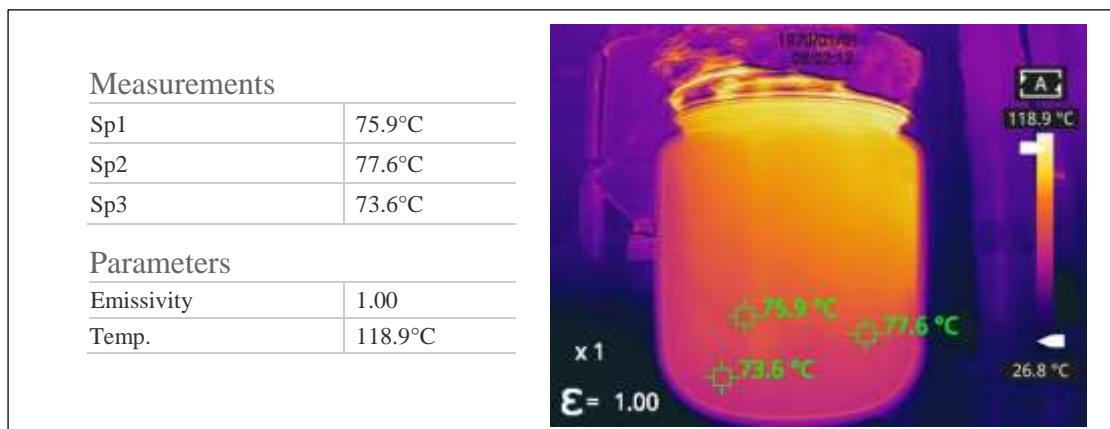
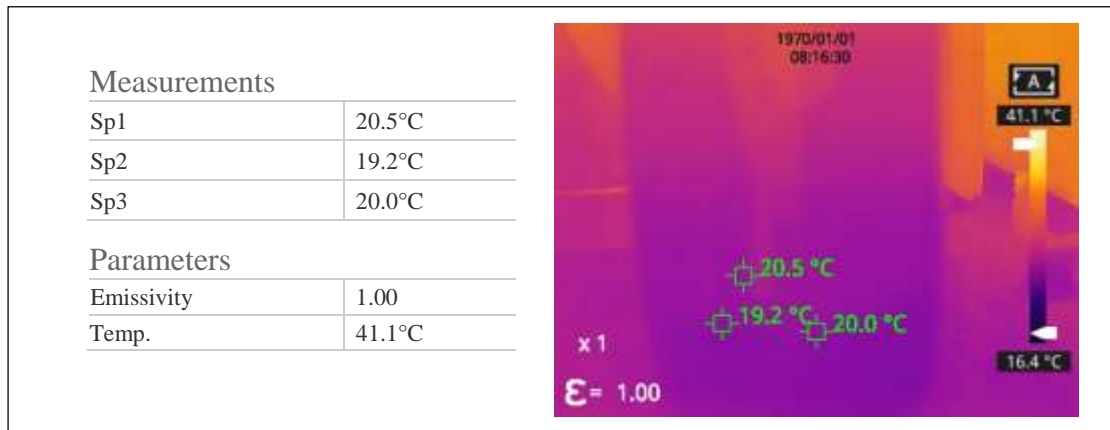
Moisture Report:

Drying started	
Date :	12-06-2023
Time :	14:33:18
Model :	AD0200
Serial number :	138
Drying parameters	
Product :	0
Drying temperature :	105.0 °C
Drying profile :	standard
Mode :	Short mode
Calculation :	$((m0-m)/m0)*100\%$
Finished :	3 samples
Initial weight :	1.013 g
Final weight :	0.978 g
Drying time :	00:02:00s
Sampling interval :	20 sec
Moisture :	3.5 %
NOTE <i>Final Moisture</i>	
The analysis performed by:	
Signature.....	<i>Aravali</i>

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Thermal Images:



Observations:

The heating behavior of the Tomato Slurry was investigated under the Spray Drying heating system. The heating rate was found to be increasing with respect to the increase in time. As per the physical investigation, the sample was spray-dried and the dried powder was recovered. The inlet temperature was ambient, passing through a drying Chamber temperature of hot air circulation was (150-160) °C, and the outlet temperature when a sample was collected (75-77) °C was observed.

Asali

Ms. Sayali Asole
(Tested By)

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