KERONE

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ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC),
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Batch Microwave+Convection Heat Treatment for Dehydration of Cooked food

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

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Customer :	**M/s. ALS Foods & Beverages**
Process :	**Batch Microwave+Convection Heat Treatment for Dehydration of Cooked food**

TEST REPORT No: 47/KRDC/LAB/17 Mum 15/12/2018

Date Sample reception : 15/12/2018
ID : 47/LAB/70

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : 4 boxes
Sampling date : 15/12/2018
Product : Cooked food (Gravy, pavbhaji, poha,sabudana khichdi)
Requirement : Final product should be dried like powder form with minimum moisture content
Start Date test : 15/12/2018
End Date test : 15/12/2018

LABORATORY EXPERIMENTAL SET UP:

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LAB BATCH MICROWAVE+CONVECTION HEATING SYSTEM SPECIFICATIONS:

Microwave Power	2 kW(CW)
Frequency	2450 MHz ± 50
Convective Power	3.5 kW (air flow 350 l/min at 20^{o}C)
Microwave Exposure Zone (cavity)	1 cubic meter
Mode Stirrer	One
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250^{o}C
Exhaust Power	1HP
Tray Size	450x950x50 mm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	28.2^{o}C (±5^{o}C)
Humidity (%)	≤65% 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 120IR 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 cooked food in batch microwave heating system for dehydration treatment. For this, given cooked food samples has been placed on microwave safe tray with uniform layer to achieve even drying characteristics in microwave system. Drying treatment has been continued till it gives dry powder form of texture. After every half hour pictures of dried samples has been captured and toppling is given to samples.

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ANALYTICAL RESULTS:

Microwave Power: 0.5 kW

Temperature: 45°C

	Poha	Sabudana Khichdi	Pavbhaji	Gravy
Initial Moisture Content (%)	10.4	37.2	72.4	67.8
Final Moisture Content (%)	2.5	0.4	1.5	1.6
Total Drying Time (hours)	2.5	3	4	3.5

SAMPLE PICTURES DURING TRIAL:

1. **After 30 minutes:**

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2. After 60 minutes:

3. After 90 minutes:

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4. After 120 minutes:

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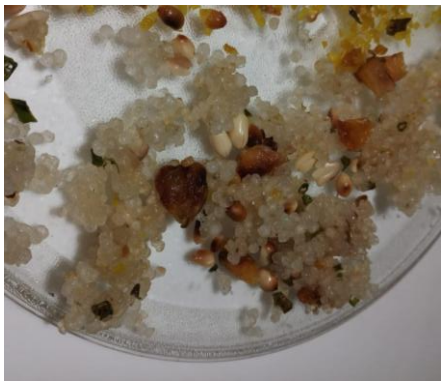
5. After 150 minutes:

6. After 180 minutes:



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7. After 210 minutes:

8. After 240 minutes:

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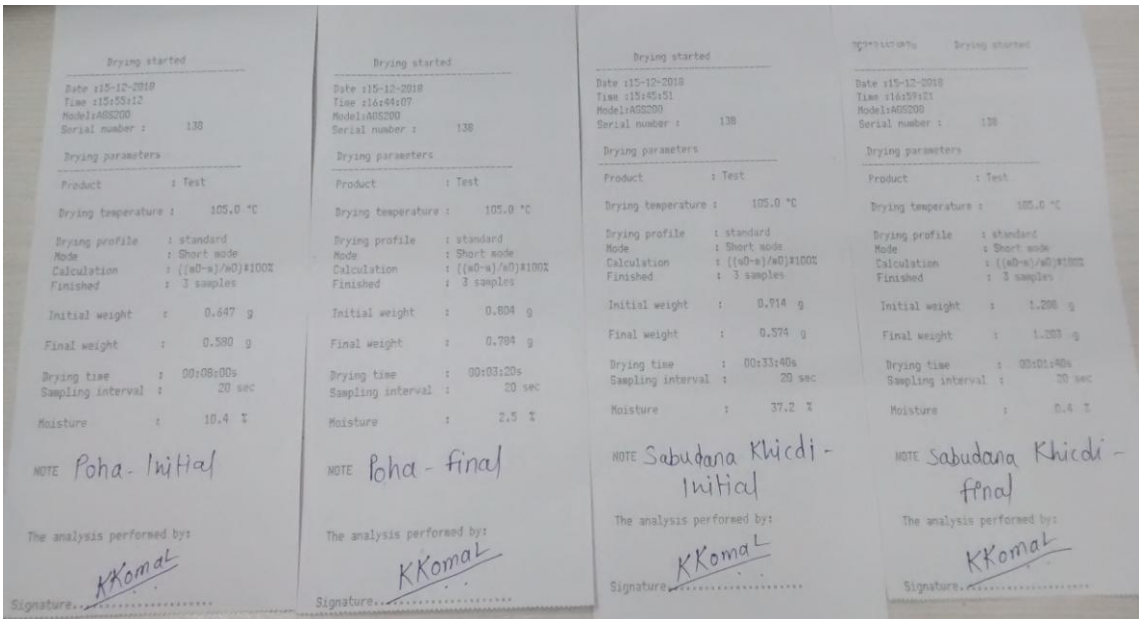
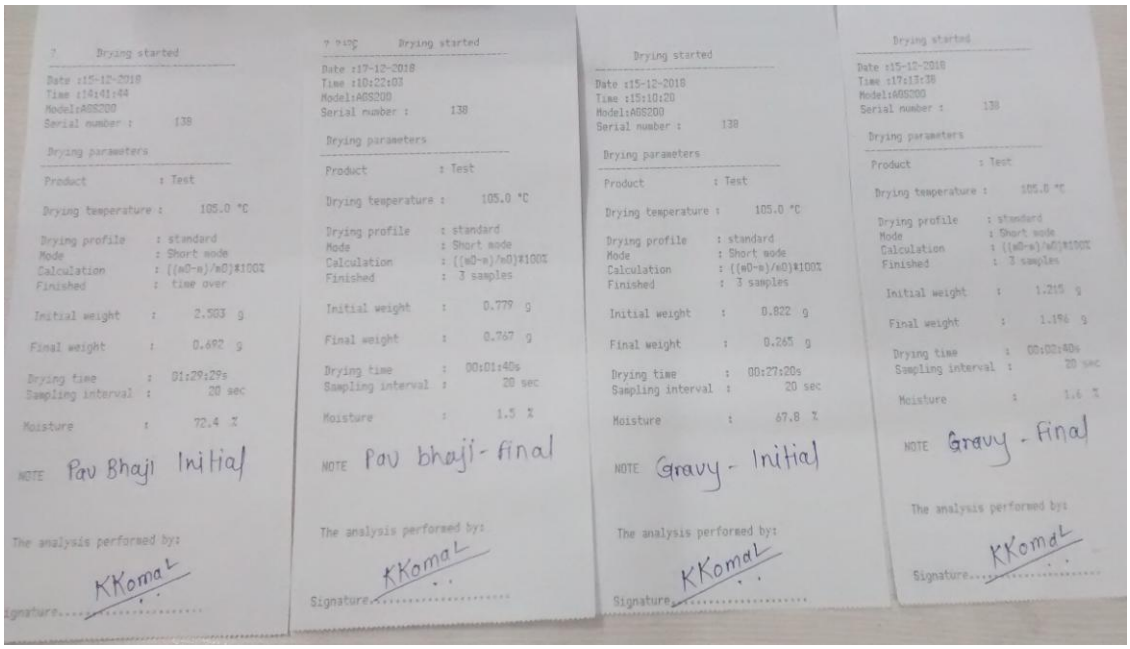
MOISTURE ANALYSIS REPORTS:





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OBSRVATIONS:

The Drying behavior of cooked food has been investigated under the microwave+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 drying time. As per physical investigation, it has been observed that there is crunchiness in texture without burning and there is little colour change in every sample. Also there is stickiness observed in case of Sabudana Khichdi.

Miss Komal Bhoite
Tested By