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ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC),  
B/47, Addl. MIDC. Anand Nagar, Ambernath (East), Thane- 421 506, India  
Tel- +91-251-2620542/43/44/45/46, Email-info@kerone.com, www.kerone.com



**Batch Microwave Heat Treatment for  
Sterilization of Senna Leaves Powder**

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



EMITECH S.p.A. - Via S. Rocco 10 - 20139 Milano (Italy)



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<b>Customer :</b>	<b>M/s. Budwhite Teas Pvt Ltd</b>
<b>Process :</b>	<b>Batch Microwave Heat Treatment for Sterilization of Senna Leaves Powder</b>

### TEST REPORT No: 47/KRDC/LAB/17 Mum 10/07/2020

Date Sample reception : 10/07/2020

ID : 47/LAB/167

### SAMPLE DESCRIPTION:

Sampling : As Requested  
 Sample Condition : Acceptable  
 Quantity : 300 gm.  
 Sampling date : 10/07/2020  
 Product : Senna Leaves Powder  
 Requirement : Sterilization  
 Start Date test : 10/07/2020  
 End Date test : 10/07/2020

### LABORATORY EXPERIMENTAL SET UP:



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**BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:**

<b>Microwave Power</b>	3 kW(CW)
<b>Frequency</b>	2450 MHz $\pm$ 50
<b>Convective Power</b>	1.5 kW (air flow 350 l/min at 20°C)
<b>Microwave Exposure Zone (Cavity)</b>	650 mm x 650 mm x 400 mm
<b>Thermal Monitoring System</b>	Single Channel Fiber Optic: Range -40 to 250°C
<b>Exhaust Power</b>	1HP
<b>Turntable Size</b>	$\varnothing$ 550 mm

**ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:**

<b>Temperature (degree C)</b>	32°C ( $\pm$ 5°C)
<b>Humidity (%)</b>	$\leq$ 84% RH
<b>Pressure (kN/m2 or kPa)</b>	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



EMITECH ANALYTICAL LABORATORY



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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
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

**SAMPLE PREPARATION AND METHOD/PROCEDURE:**

The experiment has been performed on given sample of Senna Leaves Powder to speed up the heating rate for sterilization treatment. For this experimental run, given sample has been sealed packed in microwave transparent bags and placed inside batch microwave heating system for 3 mins to achieve sterilization treatment. The observations are made on the basis of temperature on product and any damage to sample and bag.

**ANALYTICAL RESULTS:**

Sample quantity (grams)	MW Power (kW)	Time (minutes)	Temp. on product (°C)	Remarks, if any
300	1.4	3	75-85	No change colour change





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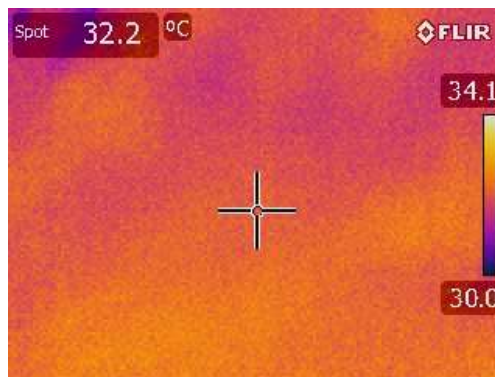
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## THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

### 1. Before Heat Treatment:



### 2. After Heat Treatment:



## BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:



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IN ASSOCIATION WITH EMitech, ITALY



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## OBSRVATIONS:

The heating behavior of senna powder samples has been investigated under the microwave irradiation mode for sterilization treatment. As per physical investigation, it has been observed that there is no colour change in sample with required temperature on product and no damage to bag.

Miss. Komal Bhoite

Tested By

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The value obtained is already corrected for possible recover value stated, if applicable. This document may not be reproduced or disclosed wholly or partly in any part thereof without the written consent of the laboratory management or customer. This document relates only to the specimen samples processed. The processed sample will be kept in this laboratory for 7 days from the date of heat treatment.