THOOSHAN®

HUSK TO RUSK

BIODEGRADABLE TABLEWARE FROM
AGRICULTURAL WASTE

PRODUCT INFORMATION

THOOSHAN®

Thooshan

No.L-6, AVM Hatchery Campus,
Nethajipuram Velanthavalam Road,
K.G Chavadi, Coimbatore-641105,
Tamil Nadu, India

ABOUT

THOOSHAN

THOOSHAN is a brand that is driven by a clear vision to provide the world with eco-friendly products. The brand proudly originates from Kerala, India, also known as "God's own country." The founder of the brand, **Vinayakumar Balakrishnan (Vinay)**, is renowned for his innovative approach and was motivated to create a brand that could revolutionize the niche market of disposable products such as straws, cutleries and plates. His vision resulted in **THOOSHAN**, a line of fully biodegradable tableware made from sustainable organic materials like wheat bran, rice bran, paddy husk, and other agricultural waste products. The brand technically collaborated with two of India's premier research laboratories, namely the CSIR-National Institute for Interdisciplinary Science and Technology (NIIST CSIR) and the Central Institute of Petrochemicals, Engineering and Technology (CIPET), to fully develop their innovative idea.

MANUFACTURING

THOOSHAN is a product that has been conceptualized and crafted from a state-of-the-art, fully automatic, and robotic factory that adheres to strict standards of hygiene and precision. Thanks to a network of independent distributors who have received orientation on the brand's philosophy and product dynamics, THOOSHAN strives to exceed all market expectations. THOOSHAN is committed to delivering high-quality biodegradable products and ensuring that each product undergoes a value-added manufacturing process, which enhances the brand's reliability. The company achieves this through a system that keeps up with market trends and responds to changing demands. As a result, THOOSHAN is becoming known as a brand that consistently delivers superior products while remaining committed to sustainable and environmentally friendly practices.

PRODUCTS

FEATURES & CERTIFICATIONS

Product Name: Wheat Bran Plates
Available Sizes: 6/10/12 inch (round)
Packing: As per wholesale requirement
Weight: 35-180 gms per piece
Ingredients: Wheat bran with natural, organic additives
Colour: Brown
HSN Code: 19059090

Usage:
Ideal for usage in parties, picnics, buffet meals, events, weddings, public functions,5 star hotels, resorts and **HORECA** segment.
Storage: Cool, dry place, with humidity <75%, temperature <25°, prevent wetting

Product Features:
1. Single use only
2. Biodegradable in 30 days
3. Home compostable
4. Microwave friendly
5. Can withstand tempergtures from -10° to +140°
6. High water retention capacity
7. Shelf life of 6 months
8. Can be used as organic manure
9. Contains gluten
10. Can be reused as cattle/fish/poultry feed.
11. Extra income for farmers, for their waste.
12. Single use
13. Blisters may appear

Certifications: Certified as safe for human contact

TUV SUD (Hungary)

CERTIFICATE OF COMPLIANCE

NIIST CSIR (Govt of India)

राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान
NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY

4th December 2020

To whomsoever it may concern

The technology for manufacturing **agri** *based cutleries have been developed by CSIR-NIIST. The entire process is optimized and machineries designed for the bulk production of single use, eco-friendly, biodegradable and micro wave friendly* **agri** *based cutleries. The technology is now ready for commercialization. Biodegradability test, Shelf life test and Toxicity test have been conducted and the product is found to biodegradable in nature within thirty days with a shelf life of six months and have no toxicity.*

(Nishy P)

Ministry of Health (Govt of Kuwait)

Kuwait Institute for Scientific Research

ENVIRONMENT & LIFE SCIENCE
RESEARCH CENTER
Biotechnology Program

MICROBIOLOGICAL EXAMINATION REPORT

Client:	Future Air Conditioning-Refrigeration & Contr. Co. W.L.L
Sample:	THOOSHAN Wheat Bran Plate
Receipt conditions :	Satisfactory
Sample ID :	ELSRC3TR_15DEC2023_01
Client Sample ID:	THOOSHAN Wheat Bran Plate
Number of Samples	1 Sample
Received :	15/08/2023
Analyzed :	17/08/2023
Report Date :	24/08/2023
Approved :	
Section Head :	QC/QA unit Head
Mohamed Al	Eng. Hamad Al-Mansour

Tests Undertaken: Microbiological Examination for detection of E. Coli & Salmonella

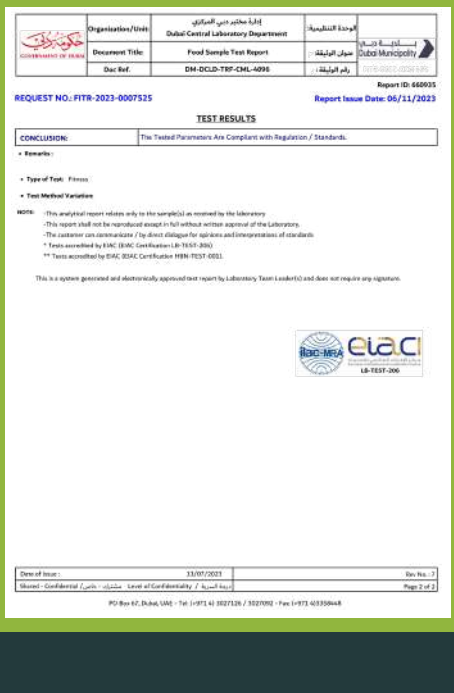
The Results Obtained:

Parameters	Test Methods	Units	Results	Specification
Enumeration of *Escherichia coli*	Mod. ISO 16649-2:2001	CFU/g	<1	<1
Enumeration of *Salmonella*	Mod. ISO 6579-1:2017	CFU/g	<1	<1

Remarks: -"Absence of *Escherichia coli* and *Salmonella* in the sample."

Eng. Hamad Al-Mansour
Lab Focal Point
Environmental and Life Sciences Research Center

Ministry of Health (Govt of UAE)



	Organization/Unit:	Dubai Central Laboratory Department	Dubai Municipality
	Document Title:	Food Sample Test Report	
	Doc Ref.	DM-DCLD-TRF-CML-4096	

Report ID: 660935

REQUEST NO.: FITR-2023-0007525

Report Issue Date: 06/11/2023

TEST RESULTS

CONCLUSION:	The Tested Parameters Are Compliant with Regulation / Standards.

- Remarks :
- Type of Test: Fitness
- Test Method Variation

NOTE: -This analytical report relates only to the sample(s) as received by the laboratory
-This report shall not be reproduced except in full without written approval of the Laboratory.
-The customer can communicate / by direct dialogue for opinions and interpretations of standards
* Tests accredited by EIAC (EIAC Certification LB-TEST-206)
** Tests accredited by EIAC (EIAC Certification MRN-TEST-0011.

This is a system generated and electronically approved test report by Laboratory Team Leader(s) and does not require any signature.

LB-TEST-206

Date of Issue :	13/07/2023	Rev No. : 7
Shared - Confidential / مشترك - سرية / Level of Confidentiality		Page 2 of 2

PO Box 67, Dubai, UAE - Tel: (+971 4) 3027126 / 3027092 - Fax: (+971 4) 3035948

Product Name: Paddy Husk Plates (Rice)
Available Sizes: 12 inch (round)
Packing: As per wholesale requirement
Weight: 100 gms per piece
Ingredients: Rice paddy husk with natural, organic additives
Colour: Brown
HSN Code: 12130000

Usage:
Ideal for use in parties, picnics, buffet meals, events, weddings, public functions,5 star hotels, resorts and **HORECA** segment.

Product Features:

1. Recommended single use only (can be reused for dry items)
2. Biodegradable in 30 days
3. Home compostable
4. Microwave friendly
5. Can withstand temperatures from -10° to +140°
6. High water retention capacity
7. Shelf life of 12 months
8. Can be reused as organic manure
9. Extra income for farmers, for their waste.

Storage: Cool, dry place, with humidity <75%, temperature <25°, prevent wetting

Certification: Certified as safe for human contact

राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान
NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्
इंडस्ट्रियल एस्टेट पी. ओ, पाप्पानमकोड
तिरुवनंतपुरम, केरल, भारत 695019

Council of Scientific & Industrial Research
Industrial Estate P O, Pappanamcode
Thiruvananthapuram, Kerala, India 695019

Dr. P. Nishy
Chief Scientist
Head, RPSD

4th December 2020

To whomsoever it may concern

The technology for manufacturing agri based cutleries have been developed by CSIR-NIIST. The entire process is optimized and machineries designed for the bulk production of single use, eco-friendly, biodegradable and micro wave friendly agri based cutleries. The technology is now ready for commercialization. Biodegradability test, Shelf life test and Toxicity test have been conducted and the product is found to biodegradable in nature within thirty days with a shelf life of six months and have no toxicity.

(Nishy P)

Tel: 91 471 2515293, 2490672; Fax: 91 471 2491895; E-mail: nishy@niist.res.in , krc@niist.res.in, website: http://www.niist.res.in

Product name: Rice Drinking Straws
Sizes:
Thin straws: 6.5mm(dia) x200mm (length)
Cocktail straws: 8mm(dia) x140mm (length)
Standard straws: 8mm(dia)x200mm (length)
Jumbo straws: 12mm(dia) x200mm (length)
Colour: Multicolour
HSN Code: 19030000

Weight: 8-12gms per straw
Ingredients: Rice flour, corn starch, tapioca flour
Packaging: As per requirement
Available as: Individually wrapped or unwrapped

Product features:

1. Withstands upto 1 hour in normal or cold drinks
2. Approved food colouring used
3. Certified by Govt of India, TUV, EU & FDA complied
4. Biodegradable in 60 days & kitchen compostable
5. Can be reused as cattle/fish/poultry feed or as organic manure

Usage: (not recommended for hot drinks): Ideal for use in Parties, Picnics, Buffet meals, events, weddings, public functions,5 star hotels, resorts and **HORECA** segment.

Storage: Cool, dry place, with humidity <75%, temperature <25°, prevent wetting

Certifications: Certified as safe for human contact

CERTIFICATE OF COMPLIANCE

Name of product: [illegible]

Type and identification of product: [illegible]

Produced by / Origin: India

[illegible]

COMPLY

[illegible]

Test conditions

[illegible]

Business unit manager
EMI TÜV SÜD Kft

DocuSign Envelope ID: CF7ED9E2-586C-4939-86D8-8269F277C6AE

MERIEUX NutriSciences

CERTIFICATE 100 % EDIBLE PRODUCT

PRODUCT: Rice drinking straws

Considering the information provided by the manufacturer (see attached technical data sheet), where the product is described as a **drinking straw** 100% Bio-degradable and neutral flavoured edible drinking Straws",

Considering that, according to the technical data sheet, the ingredients of the product are: *"Rice, corn/maize starch, water and Tapioca flour"*,

Considering that all ingredients used are of food grade quality and that the product has been prepared, packed, stored and transported following the guidelines and food regulations,

Considering the final product is not regulated by any specific legislation, so allowed ingredients or specific composition are not defined,

Considering that, according to the technical data sheet, the presence of additive sulphur dioxide (E220-228) in the final product is due to the presence of ingredient corn/maize starch (possibility of naturally occurring or as a processing aid) but the quantity of this additive in corn/maize starch complies with the following regulation related the use of additives:

- Regulation (EC) No 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives.

Considering that the final product is biodegradable, according with the point 4.3.2 of the UNE-EN 13432 [REQUIREMENTS FOR PACKAGING RECOVERABLE THROUGH COMPOSTING AND BIODEGRADATION. TEST SCHEME AND EVALUATION CRITERIA FOR THE FINAL ACCEPTANCE OF PACKAGING]:

"4.3.2 Materials of natural origin. Non-chemically modified packaging materials and constituents of natural origin, such as wood, wood fibers, starch, paper pulpe or jute, must be accepted as biodegradable without testing (see Chapter 6) but must be chemically characterized (see Chapter 6). section 4.2) and meet the criteria for disintegration (see Chapter 7) and compost quality (see Chapter 8)."

And considering the product is marketed as a foodstuff,

Based on the foregoing,

WE CERTIFY THAT:

The product "Rice drinking straw" as described above with the established conditions, is 100% edible and biodegradable like all other food.

December 17th, 2021

Roger [illegible]
– Director –

Annex: Technical data sheet of the product provided by the producer.

SILLIKER Ibérica S.A.U.

Sede Madrid

www.merieuxnutrisciences.es

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fssai

Form C
Government of India
Food Safety and Standards Authority of India
License under FSS Act, 2006

अनुज्ञप्ति संख्या / License Number: **13622999000275**

Category of License / अनुज्ञप्ति का वर्ग: **Central License**

This license is granted under and is subject to the provisions of FSS Act, 2006 all of which must be complied with by the licensee. / यह अनुज्ञप्ति खाद्य संरक्षा और मानक अधिनियम, 2006 के अधीन अनुदत्त की गई और यह अधिनियम के उपबंधों के अध्यादीन है जिनका अनुज्ञप्तिधारी द्वारा अवश्य पालन किया जाना चाहिए.

Place / स्थान: FSSAI Chennai

Issued On / दिनांक: 04-06-2023 (Renewal License)

Valid Upto: / वैधता: 20-06-2024 (For details, refer Annexure)

Designated Officer

Annexures:

1. Product Annexure
2. Validity Annexure
3. Non-Form C Annexure
4. Conditions Of License

Note:

1. **Application for renewal of License can be filed as early as 180 days prior to expiry date of License. You can file application for renewal or modification of License by login into FSSAI's Food Safety Compliance System(https://foscos.fssai.gov.in) with your user id and password or call us at 1800112100 for any clarification.**
2. **This License is only to commence or carry on food businesses and not for any other purpose.**
3. **This is computer generated license and doesn't require any signature or stamp by authority.**

Page 1 of 6

Product name: Fork, Knife, Spoon & Spork
Available sizes: 7/8/9 inches
Weight: Less than 10 gms
Ingredients: Rice bran mixed with bioplastic
Packaging: As per requirement
Colour: Black
HSN Code: 39241000

Usage:
Ideal for use in parties, picnics, buffet meals, events, weddings, public functions, airline & sealine industry, 5 star hotels, resorts and **HORECA** segment.

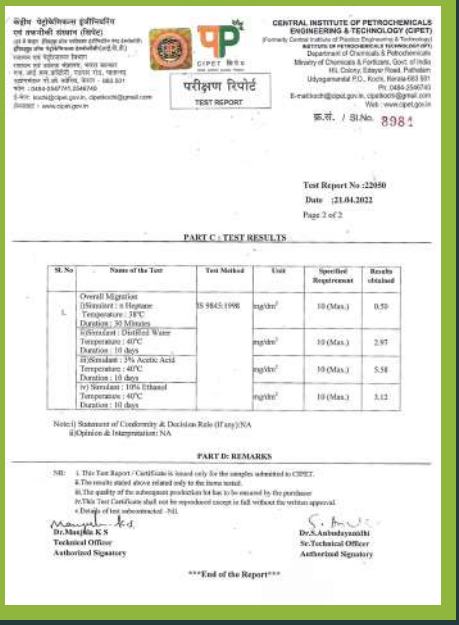
Product features:

1. Sturdy
2. Sleek
3. Customisable
4. Not edible
5. Industrially compostable
6. Single use
7. Long shelf life
8. Not microwavable
9. Single use

95% biodegradable in 90 days, 100% biodegradable in 180 days.

Storage: Cool, dry place, with humidity <75%, temperature <25, prevent wetting

Certifications: Certified as safe for human contact



केंद्रीय पेट्रोकेमिकल इंजीनियरिंग एवं प्रौद्योगिकी संस्थान (सिपेट)
(पूर्व में केंद्रीय प्लास्टिक इंजीनियरिंग एवं प्रौद्योगिकी संस्थान (सीपेट))
रसायन एवं पेट्रोरसायन विभाग

CIPET

परीक्षण रिपोर्ट
TEST REPORT

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY (CIPET)
(Formerly Central Institute of Plastics Engineering & Technology)
INSTITUTE OF PETROCHEMICALS TECHNOLOGY (IPT)
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
HIL Colony, Edayar Road, Pathalam
Udyogamandal P.O., Kochi, Kerala-683 501
Ph: 0484-2546745
E-mail:kochi@cipet.gov.in, cipetkochi@gmail.com
Web : www.cipet.gov.in

क्र.सं. / Sl.No. 8984

Test Report No :22050
Date :21.04.2022
Page 2 of 2

PART C : TEST RESULTS

Sl. No	Name of the Test	Test Method	Unit	Specified Requirement	Results obtained
1.	Overall Migration i)Simulant : n Heptane Temperature : 38°C Duration : 30 Minutes	IS 9845:1998	mg/dm²	10 (Max.)	0.50
	ii)Simulant : Distilled Water Temperature : 40°C Duration : 10 days		mg/dm²	10 (Max.)	2.97
	iii)Simulant : 3% Acetic Acid Temperature : 40°C Duration : 10 days		mg/dm²	10 (Max.)	5.58
	iv) Simulant : 10% Ethanol Temperature : 40°C Duration : 10 days		mg/dm²	10 (Max.)	3.12

Note:i) Statement of Conformity & Decision Rule (If any):NA
ii)Opinion & Interpretation: NA

PART D: REMARKS

NB: i. This Test Report / CertiFicate is issued only for the samples submitted to CIPET.
ii.The results stated above related only to the items tested.
iii.The quality of the subsequent production lot has to be ensured by the purchaser
iv.This Test CertiFicate shall not be reproduced except in full without the written approval.
v.Details of test subcontracted :Nil.

Dr.Manjula K S
Technical Officer
Authorised Signatory

Dr.S.Anbudayanithi
Sr.Technical Officer
Authorised Signatory

End of the Report

केंद्रीय पेट्रोकेमिकल इंजीनियरिंग एवं प्रौद्योगिकी संस्थान (सिपेट)
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रसायन एवं पेट्रोरसायन विभाग

CIPET

परीक्षण रिपोर्ट
TEST REPORT

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY (CIPET)
(Formerly Central Institute of Plastics Engineering & Technology)
INSTITUTE OF PETROCHEMICALS TECHNOLOGY (IPT)
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
HIL Colony, Edayar Road, Pathalam
Udyogamandal P.O., Kochi, Kerala-683 501
Ph: 0484-2546745
E-mail:kochi@cipet.gov.in, cipetkochi@gmail.com
Web : www.cipet.gov.in

क्र.सं. / Sl.No. 8984

Issued to :

M/s VIR Naturals Pvt Ltd
C9 Tower 2,INKEL Business Park
Angamaly,Kochi-683573
Kerala,India

Test Report No :22050
Date :21.04.2022

Page 1 of 2

Ref No: Your mail Dt 02.07.2021

PART A : PARTICULARS OF SAMPLE SUBMITTED

Nature of Sample	:	PLA / rice bran cutlery samples as stated by party
Grade / Variety / type / Size / Class etc.	:	Nil
Brand name, if any	:	Nil
Declared values, if any	:	Nil
Code No.	:	Nil
Batch No. and date of manufacture	:	Nil
Quantity	:	1 Set
Mode of Packing	:	Not Packed
Date of receipt of sample	:	10.04.2022
Date of commencement of test	:	10.04.2022
Date of completion of test	:	20.04.2022
Sealed or not	:	Not Sealed
Any other information	:	Nil

PART B: SUPPLEMENTARY INFORMATION

a) Reference to sampling procedure : Supplied by the party
b) Supporting documents for the measurements taken and results derived like graphs, tables, sketches and / or photographs as appropriate to test report, if any (to be attached) : Nil
c) Deviation from the test methods as prescribed in relevant ISS / Work instructions, if any : Nil

राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान
NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY
वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् | Council of Scientific and Industrial Research
इंडस्ट्रियल इस्टेट पी. ओ. पापनमकोड, तिरुवनंतपुरम, भारत - 695 019 | Industrial Estate P.O., Pappanamcode,Thiruvananthapuram, India-695 019

Report No.: NIIST-ETD/APTD/Bio-Deg-R-25/SP(PLA+WB)-02 Date: 19-12-2022

Description	Week 9	Week 10	Week 11
Sample Structure/ Colour	Granular / light brown colour	Granular / light brown colour	Granular / light brown colour
Moisture	Appropriate	Appropriate	Appropriate
Matrix Colour	Dark brown	Dark Brown	Dark Brown
Smell	Wheat flour like	Wheat flour like	Wheat flour like
Fungal Development	Not observed	Not observed	Not observed

Comments:

- **Significant physical disintegration or structural change of the sample observed in due course of degradation study.**
- **Noticeable change in colour of the test sample was observed.**
- **No test sample was observed after sieving the material through a 2.0 mm sieve (IS standard) at the end of experiment.**

Authorised Signatory

(Contd.....)

Page 5 of 7

राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान
NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY
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Report No.: NIIST-ETD/APTD/Bio-Deg-R-25/SP(PLA+WB)-02 Date: 19-12-2022

PART-V: DECLARATION

Remarks:

- All the testing and analysis is done by following standard methods.
- No deviation from the standard test method.

NOTE:

- The testing and analysis results are related only to the items tested as submitted by the party.
- All the testing and analysis were performed with the same material submitted by the party *"As it is"* without any physico-chemical modifications.
- This analysis report shall not be reproduced in part without the prior written permission of Director, CSIR-NIIST.
- This report cannot be used in connection with any judiciary trial/civil proceedings.

Authorised Signatory

----End of the report----

Page 7 of 7

Product name: Food takeaway containers
Available as: 500ml, 750ml, 1000ml container with lid
Weight: below 25gms
Packaging: As per required
Ingredients: Rice bran mixed with bioplastic
HSN Code: 39241000

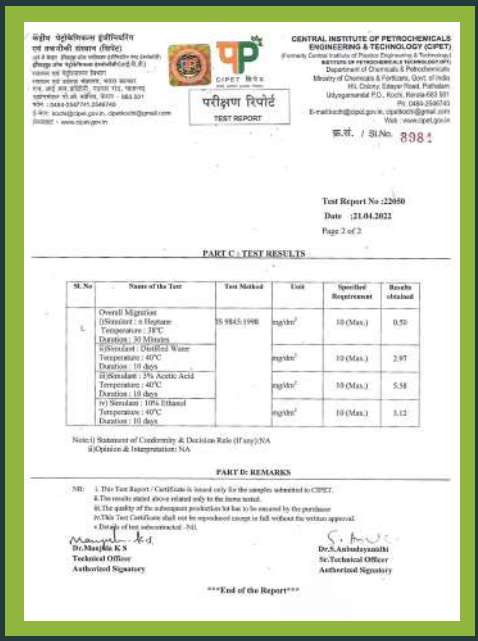
Usage:
Ideal for use in parties, picnics, buffet meals, events, weddings, public functions, airline & sealine industry, 5 star hotels, resorts and **HORECA** segment.

Product Features:
1. Sturdy
2. Sleek
3. Customisable shape
4. Not edible
5. Industrially compostable
6. Single use
7. Long shelf life
8. Can be reused to plant seedlings

95% biodegradable in 90 days, 100% biodegradable in 180 days.

Storage: Cool, dry place, with humidity <75%, temperature <25°C, prevent wetting

Certifications: Certified as safe for human contact



केंद्रीय पेट्रोकेमिकल इंजीनियरिंग एवं प्रौद्योगिकी संस्थान (सिपेट)

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY (CIPET)

परीक्षण रिपोर्ट
TEST REPORT

क्र.सं. / Sl.No. 8984

Test Report No :22050
Date :21.04.2022
Page 2 of 2

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Note:i) Statement of Conformity & Decision Rule (If any):NA
ii)Opinion & Interpretation: NA

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v.Details of test subcontracted :Nil.

Dr.Manjula K S
Technical Officer
Authorised Signatory

Dr.S.Anbudayanithi
Sr.Technical Officer
Authorised Signatory

End of the Report

केंद्रीय पेट्रोकेमिकल इंजीनियरिंग एवं प्रौद्योगिकी संस्थान (सिपेट)

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY (CIPET)

परीक्षण रिपोर्ट
TEST REPORT

क्र.सं. / Sl.No. 8981

Issued to :

M/s VIR Naturals Pvt Ltd
C9 Tower 2,INKEL Business Park
Angamaly,Kochi-683573
Kerala,India

Test Report No :22050
Date :21.04.2022

Page 1 of 2

Ref No: Your mail Dt 02.07.2021

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Nature of Sample	:	PLA / rice bran cutlery samples as stated by party
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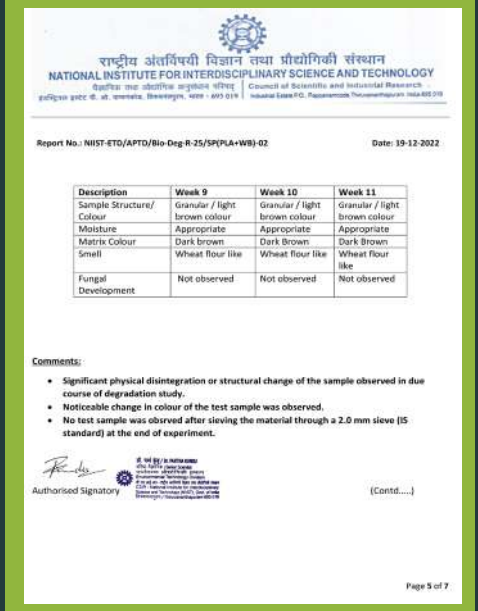
Brand name, if any	:	Nil
Declared values, if any	:	Nil
Code No.	:	Nil
Batch No. and date of manufacture	:	Nil
Quantity	:	1 Set
Mode of Packing	:	Not Packed
Date of receipt of sample	:	10.04.2022
Date of commencement of test	:	10.04.2022
Date of completion of test	:	20.04.2022
Sealed or not	:	Not Sealed
Any other information	:	Nil

PART B: SUPPLEMENTARY INFORMATION

a) Reference to sampling procedure : Supplied by the party
b) Supporting documents for the measurements taken and results derived like graphs, tables, sketches and / or photographs as appropriate to test report, if any (to be attached) : Nil
c) Deviation from the test methods as prescribed in relevant ISS / Work instructions, if any : Nil



राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान
NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY
वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् | Council of Scientific and Industrial Research

Report No.: NIIST-ETD/APTD/Bio-Deg-R-25/SP(PLA+WB)-02 Date: 19-12-2022

Description	Week 9	Week 10	Week 11
Sample Structure/ Colour	Granular / light brown colour	Granular / light brown colour	Granular / light brown colour
Moisture	Appropriate	Appropriate	Appropriate
Matrix Colour	Dark brown	Dark Brown	Dark Brown
Smell	Wheat flour like	Wheat flour like	Wheat flour like
Fungal Development	Not observed	Not observed	Not observed

Comments:

- **Significant physical disintegration or structural change of the sample observed in due course of degradation study.**
- **Noticeable change in colour of the test sample was observed.**
- **No test sample was observed after sieving the material through a 2.0 mm sieve (IS standard) at the end of experiment.**

Authorised Signatory

(Contd.....)

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Report No.: NIIST-ETD/APTD/Bio-Deg-R-25/SP(PLA+WB)-02 Date: 19-12-2022

PART-V: DECLARATION

Remarks:

- All the testing and analysis is done by following standard methods.
- No deviation from the standard test method.

NOTE:

- The testing and analysis results are related only to the items tested as submitted by the party.
- All the testing and analysis were performed with the same material submitted by the party *"As it is"* without any physico-chemical modifications.
- This analysis report shall not be reproduced in part without the prior written permission of Director, CSIR-NIIST.
- This report cannot be used in connection with any judiciary trial/civil proceedings.

Authorised Signatory

----End of the report----

Page 7 of 7

Product name:
Compostable and biodegradable bags
Available in:
Customisable sizes
Weight: Carrying weight can be customised
HSN Code:
39206919

Ingredients:
Cornstarch & Bioplastic mix
Packaging:
Available in kilograms

Product Features:

1. Sturdy
2. Customisable shape
3. Not edible
4. Industrially compostable
5. Single use
6. Biodegradable in 6 months
7. Brand details can be printed (single colour)

Usage:
Can be used as garbage bag, laundry bag, grocery bag, carry bag etc.

Storage: Cool, dry place, with humidity <75%, temperature <25°, prevent wetting

Certifications: Certified as safe for human contact

केंद्रीय पेट्रोरसायन अभियांत्रिकी एवं प्रौद्योगिकी संस्थान
पेट्रोकेमिकल्स तकनीकी संस्थान

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
INSTITUTE OF PETROCHEMICALS TECHNOLOGY
Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
Guindy, Chennai - 600 032.

रिपोर्ट सं / REPORT NO. : 68131
29-08-2022

परीक्षण रिपोर्ट / TEST REPORT

क्र.सं / Sl. No: 30055

भाग - ग / PART - C

परीक्षण परिणाम / TEST RESULTS

Test Duration: 29.12.2021 to 29.08.2022

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements
1	Material Identification	FTIR & DSC	-	Blend of Poly Lactic Acid (PLA) and Poly Butylene Adipate Co-Terephthalate (PBAT)	-
2	Disintegration (Dry mass remains in 2 mm sieve after 84 days)	ISO 17088:2021	%	8.6	No more than 10%
3	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	ISO 17088:2021	%	90.2 (at the end of 136 days)	> 90 (at the end of the test period not more than 180 days.)
4	Plant Growth study				
	Monocotyledon (Onion) % Seed emergence	ISO 17088:2021	%	91	> 90
	Dicotyledon (Tomato) % Seed Emergence		%	92	> 90
5	Acute Ecotoxic effects to earthworm				
a	Survival of adult earthworm at the end of 7 days	ISO 17088:2021 Cl.6.4.4	%	100	> 90
b	Survival of adult earthworm at the end of 14 days			100	> 90
c	Biomass end of the 14 days			96	> 90
6	Chronic Ecotoxic effects to earthworm				
a	Survival of adult earthworm at the end of 28 days	ISO 17088:2021 Cl.6.4.5	%	93	> 90
b	Survival of adult earthworm at the end of 56 days			97	> 90
c	Offspring at the end of 56 days			91	> 90
d	Biomass end of the 56 days			95	> 90

The detailed observation on biodegradability test is enclosed as Annexure

2 of 6

Contd..

AUTHORISED SIGNATORY

AUTHORISED SIGNATORY

रिपोर्ट : आई पी टी -सेमी-32
CIPET : IPT: Chennai-32

Continuation Sheet

रिपोर्ट सं / REPORT NO. : 68131 परीक्षण परिणाम / TEST RESULTS दिनांक / Date : 29-08-2022

PART C - TEST RESULTS

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements*
7	Heavy metals concentration				
a.	Arsenic (As)	ISO 17088:2021	mg/l	BDL. (DL:0.006)	10
b.	Copper (Cu)			0.005	300
c.	Nickel (Ni)			0.045	50
d.	Zinc (Zn)			0.009	1000
e	Cobalt (Co)			0.05	-
f.	Chromium (Cr)			0.055	50
g.	Molybdenum (Mo)			0.021	-
h.	Mercury (Hg)			BDL. (DL 0.0007)	0.15
i.	Cadmium (Cd)			0.191	5
j.	Lead (Pb)			0.003	100
k.	Selenium (Se)			BDL.(DL:0.013)	-

* Based on Municipal solid waste (Management and Handling) Rules, 2016 notified on 8th April, 2016 by Ministry of Environment , Forests and climate change, Government of India. Note that concentration of metals like cobalt, molybdenum, and selenium is not mentioned in the notification.

Note: BDL-Below Detection Limit ; DL-Detection Limit

PART D - REMARKS

Note
1. This Test Report / Certificate is issued only for the samples submitted to the laboratory.
2. The results stated above related only to the items tested.
3. The quality of the subsequent production lot has to be ensured by the purchaser.
4. This Test Report shall not be reproduced except in full without the written approval of the laboratory.
5. Any anomaly/discrepancy in this report should be brought to the notice of the laboratory within 30 days
6. Subcontracted Tests (if any): Nil

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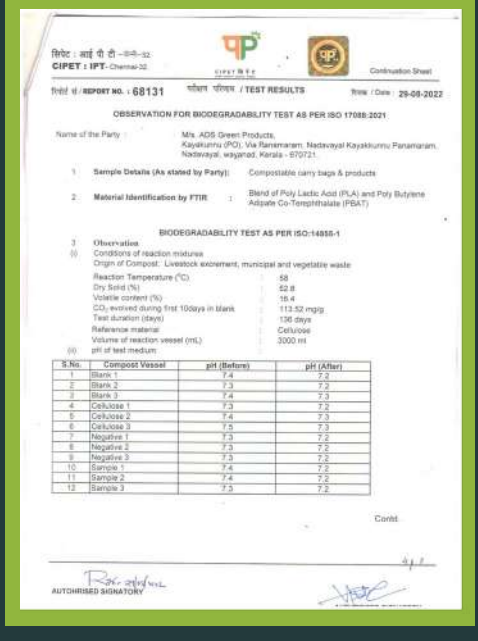

रिपोर्ट : आई पी टी -सेमी-32
CIPET : IPT: Chennai-32

Continuation Sheet

रिपोर्ट सं / REPORT NO. : 68131 परीक्षण परिणाम / TEST RESULTS दिनांक / Date : 29-08-2022

OBSERVATION FOR BIODEGRADABILITY TEST AS PER ISO 17088:2021

Name of the Party : M/s. ADS Green Products, Kayakkunnu (PO), Via Ramanmaram, Nadavayal Kayakkunnu Panamaram, Nadavayal, wayanad, Kerala - 670721.

1 **Sample Details (As stated by Party)** : Compostable carry bags & products

2 **Material Identification by FTIR** : Blend of Poly Lactic Acid (PLA) and Poly Butylene Adipate Co-Terephthalate (PBAT)

BIODEGRADABILITY TEST AS PER ISO:14855-1

3 **Observation**

(i) Conditions of reaction mixtures

Origin of Compost : Livestock excrement, municipal and vegetative waste

Reaction Temperature (°C)	: 58
Dry Solid (%)	: 52.8
Volatile content (%)	: 16.4
CO_2 evolved during first 10days in blank	: 113.52 mg/g
Test duration (days)	: 136 days
Reference material	: Cellulose
Volume of reaction vessel (mL)	: 3000 ml

(ii) pH of test medium

S.No.	Compost Vessel	pH (Before)	pH (After)
1	Blank 1	7.4	7.2
2	Blank 2	7.3	7.2
3	Blank 3	7.4	7.3
4	Cellulose 1	7.3	7.2
5	Cellulose 2	7.4	7.3
6	Cellulose 3	7.5	7.3
7	Negative 1	7.3	7.2
8	Negative 2	7.3	7.2
9	Negative 3	7.3	7.2
10	Sample 1	7.4	7.2
11	Sample 2	7.4	7.2
12	Sample 3	7.5	7.2

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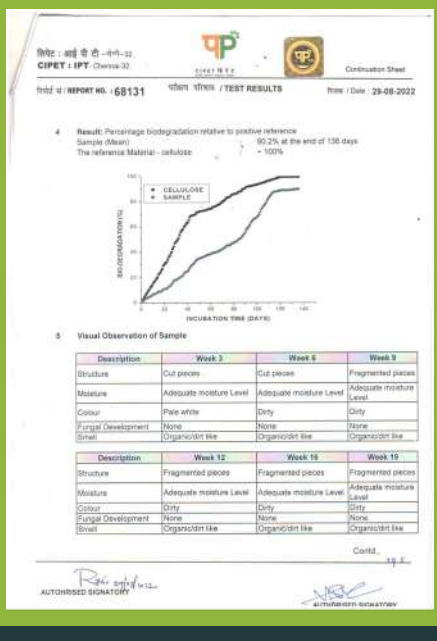
AUTHORISED SIGNATORY



रिपोर्ट : आई पी टी -सेमी-32
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Continuation Sheet

रिपोर्ट सं / REPORT NO. : 68131 परीक्षण परिणाम / TEST RESULTS दिनांक / Date : 29-08-2022

4 **Result:** Percentage biodegradation relative to positive reference
Sample (Mean) : 90.2% at the end of 136 days
The reference Material - cellulose : ~ 100%

5 **Visual Observation of Sample**

Description	Week 3	Week 6	Week 9
Structure	Cut pieces	Cut pieces	Fragmented pieces
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Pale white	Dirty	Dirty
Fungal Development	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 12	Week 16	Week 19
Structure	Fragmented pieces	Fragmented pieces	Fragmented pieces
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dirty	Dirty	Dirty
Fungal Development	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Contd..

AUTHORISED SIGNATORY

ECOLOGY

THOOSHAN was founded with a master vision to eliminate the use of disposable utensils made from plastic and paper that have left a significant impact on the environment. As an excellent alternative, THOOSHAN provides products that are highly eco-friendly and fully biodegradable, decomposing within 180 days. The company's commitment to sustainability and environmentally friendly practices ensures that its products are not only functional but also contribute to reducing the negative impact on the environment. THOOSHAN's approach to manufacturing and product development aligns with the global movement towards more sustainable and responsible consumption.

FUTURE

Thooshan will be adding more products under the brand name in its kitty, which will be 100% biodegradable compostable and eco-friendly.

APPLICATION

THOOSHAN tableware is versatile and can be used to serve both hot and cold food. It is safe to use in a microwave and is highly durable, making it suitable for use in both home and industry environments. THOOSHAN's straws and plates are convenient to carry and can be used for outdoor parties, picnics, or any activity where food consumption is required. These products have a long shelf life and are highly recommended for use in bars and restaurants. With its durability, versatility, and eco-friendliness, THOOSHAN is quickly becoming the preferred choice for those who value sustainability and convenience.

After initial use, they can be shredded to use as cattle feed, fish feed. poultry feed or even as organic manure.

AWARDS AND CERTIFICATIONS

Thooshan has been the proud recipient of a multitude of accolades and recognitions so far.

Special Jury Award for being the top 10 Eco friendly Startups in India

Invited by the Prime Minister for 'Kissan Samelan' to showcase products

FICCI Agritech National Award

National Winner of RAFTAAR ABI for Innovation in Agriculture Products, Govt of India, 2021

United Nations, UNDP "Green Innovation Fund" from Kerala Start-up Mission, 2021

Golden Award for promoting responsible tourism and qualified for WTM, London

Runner-up at Climathon 2022 conducted by EY & Kerala Startup Mission

Recipient of idea & startup grant from Kerala Startup Mission

Official tableware partner of G20 Summit 2023, Kumarakom, Kerala, India

INCUBATED AT

LET THE PURPOSE BE SERVED RESPONSIBLY

Biodegradable tableware from agri waste


100% natural


Withstands weight upto 2kg

Biodegrades within 30 days


Food contact safe


Home compostable


Blisters may appear


Non washable


Cattle feed


Can withstand temperatures from -10 to +140 degrees


The smell and taste of bran/husk may be present


Wheat bran plates contain gluten, rice husk plates contain lignan


Shelf life upto 1 year


Vegan friedniy


Organic manure


Poultry feed


Fish feed

Cutleries & containers


Food contact safe


Not edible

Can withstand temperatures upto 40 degrees


Non washable


Home compostable


Shelf life of upto 3 years


Vegan friendly

Thooshan

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