

सिपेट : एस. ए. आर. पि.-पॉलीमेरिक, मटेरीयल में अत्याधुनिक अनुसंधान हेतु प्रयोगशाला

रसायन एवं पेट्रोरसायन विभाग, रसायन एवं उर्वरक मंत्रालय, भारत सरकार

बी/२५, सि.एन.आई.कॉम्प्लेक्स, पटिआ, भुवनेश्वर-751024, ओडिशा

CIPET : SARP - LABORATORY FOR ADVANCED RESEARCH IN POLYMERIC MATERIALS



Dept. of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, Govt. of India

B/25, C.N.I. Complex, Patia, Bhubaneswar-751 024, Odisha

Ph : 0674 - 2742852, 2740173, Fax : 0674 - 2740463

E-mail : larpm@cipet.gov.in, Web : www.larpm.gov.in



CERTIFICATE OF ANALYSIS AS PER ISO 17088:2021

LARPM/CIPET/Testing/2024-25/

Date-14.03.2025

To,

M/s. ITC Limited Paperboards & Specialty papers Division,
Unit-Bollaram, Anrich Industrial Estate,
Bollaram Village, Jinnarammandal,
Sangareddy, Telangana - 502325

Sub -Test Report-Reg.

Dear Sir,

Ref No : 1) SSF dated 21.06.2023 & Email dated 10.12.2024.

2) Our Work Order No.: LARPM/BBS./2024-25/068 dated 24.06.2024.

With reference to the above, the submitted sample was analyzed as per ISO 17088:2021. The summary detail of testing & analysis is given below:

Company Name & Address : M/s. ITC Limited Paperboards & Specialty papers Division,
Unit-Bollaram, Anrich Industrial Estate,
Bollaram Village, Jinnarammandal,
Sangareddy, Telangana - 502325

Sample Details : "FILOBOWL/FILOBEV PREMIUM/FILOBEV MINI,
Sample ID: A" – as stated by the party.

Test Report No : 01612 & dated 14.03.2025

Date of Receipt of sample : 24.06.2024

Date of Initiation : 24.06.2024

Date of Completion : 14.03.2025

Percentage of Compostability : 90.71

In 161 days

Requirement of Compostability in : 90 %

180 days as per ISO 17088:2021

The sample submitted by M/s. ITC Limited Paperboard & Specialty Papers Division is compostable and the percentage of compostability in 161 days reported vide test report No. 01612 is 90.71%.

The submitted sample also complies with the terms of compostability seed germination and disintegration as per ISO 17088:2021.

Thanks & Regards,


Dr. Akshaya Kumar Palai
(Quality Manager)

Encl : Analysis Report



ANALYSIS REPORT

Report No. : 01612

Date : 14.03.2025

Issued to

M/s. ITC Limited Paperboards & Specialty papers Division,
Unit-Bollaram, Anrich Industrial Estate,
Bollaram Village, Jinnarammandal,
Sangareddy, Telangana - 502325

Customer Ref. No. & Date : SSF dated 21.06.2023 & Email dated 10.12.2024.

Work order Ref. No. & Date : LARPM/BBS./2024-25/068 dated 24.06.2024.

As per Standard : Refer part C

PART A: PARTICULARS OF SAMPLE SUBMITTED

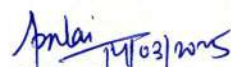
- | | |
|--|--|
| a) Name of the Sample | : FILOBOWL/FILOBEV PREMIUM/FILOBEV MINI
- as stated by the party. |
| b) Grade/verity/Type/Size/Class etc. | : Nil. |
| c) Code No. | : A - as stated by the party. |
| d) Quantity (pcs./mtr/gm/nos) | : 500 gm approx. |
| e) Mode of packing
(Sealed carton/polypouch/container or not) | : Packed in Carton. |
| f) Date of receipt of sample | : 24.06.2024 |
| g) Date of Performance of test | : 24.06.2024 – 14.03.2025 |
| h) Any other information | : Interim report No. 01475 dated 11.12.2024. |

PART B: SUPPLEMENTARY INFORMATION

- | | |
|---|---------------------------------|
| a) Reference to sampling procedure | : Drawn & Supplied by the party |
| b) Supporting documents for
Measurements taken and results derived
like graphs, tables, sketches and/or
Photographs as appropriate to
test report if any (to be attached) | : As per part -C |
| c) Deviation from the test methods as
Prescribed in relevant ASTM/ISO/BIS/
Work Instructions, If any- | : Nil |


Mr. Pinaki Chatterjee
(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY


Dr. Akshaya Kumar Palai
(Quality Manager)
AUTHORISED SIGNATORY

सिपेट : एस. ए. आर. पि.-पॉलीमेरीक, मटेरीयल में अत्याधुनिक अनुसंधान हेतु प्रयोगशाला

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CIPET : SARP - LABORATORY FOR ADVANCED RESEARCH IN POLYMERIC MATERIALS



सिपेट CIPET

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PART C: TEST RESULTS

ANALYSIS REPORT

Report No : 01612

Date : 14.03.2025

Sl. No	Name of the Test	Test Method/Standard	Unit	Results Obtained	Specified Requirements
Sample Details: "FILOBOWL/FILOBEV PREMIUM/FILOBEV MINI, Sample ID: A" - as stated by the party					
1.	Material Identification	FTIR/DSC	--	Paper sample (Cellulose material) with one side ethylene- acrylic based dispersion coating	---
2.	Disintegration (Dry mass remains in 2 mm sieve after 84 days)	Cl. 6.2 of ISO 17088:2021	%	8.83	Not more than 10% of its original dry mass
3.	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	Cl. 6.3.1 of ISO 17088:2021 ISO:14855-1	%	90.71 (at the end of 161 days)	> 90 (at the end of the test period not more than 180 days.)
4.	Plant Growth study a) Monocotyledon (Rice) % Seed Emergence b) Dicotyledon (Mung) % Seed Emergence	Cl. 6.4.3 of ISO 17088:2021 (Annex C)	% %	94.5 97.5	> 90 > 90

Mr. Pinaki Chatterjee
(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY

Dr. Akshaya Kumar Palai
(Quality Manager)
AUTHORISED SIGNATORY

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बी/२५, सि.एन.आई.कॉम्प्लेक्स, पटिआ, भुवनेश्वर-751024, ओडिशा

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PART C: TEST RESULTS

ANALYSIS REPORT

Report No : 01612

Date : 14.03.2025

Date : 14.05.2025

Sl. No	Name of the Test	Test Method/Standard	Unit	Results obtained	Specified Requirements
5.	Acute Ecotoxic Effects to earthworm				
a.	Survival of adult earthworm at the end of 7 days	Cl. 6.4.4 of ISO 17088-2021 (Annex D)	%	100	> 90% of those from the corresponding blank compost
b.	Survival of adult earthworm at the end of 14 days		%	100	
c.	Biomass at the end of 14 days		%	98.2	
6.	Chronic Ecotoxic Effects to earthworm				
a.	Survival of adult earthworm at the end of 28 days	Cl. 6.4.5 of ISO 17088-2021 (Annex E)	%	100	> 90% of those from the corresponding blank compost
b.	Offspring at the end of 56 days		%	100	
c.	Biomass at the end of 56 days		%	98.5	

Note: The detailed observation on biodegradability test is enclosed as **Annexure-I**.


Mr. Pinaki Chatterjee

(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY


Dr. Akshaya Kumar Palai
(Quality Manager)
AUTHORISED SIGNATORY



सिपेट CIPET

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ANALYSIS REPORT

Report No.: 01612

Date : 14.03.2025

PART C: TEST RESULTS

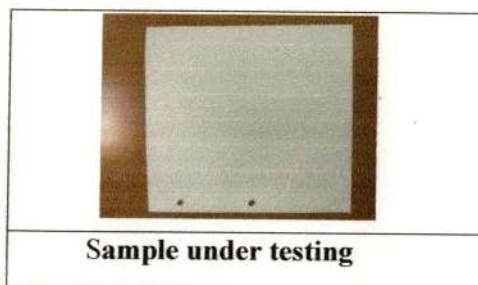
Sl. No	Name of the Test	Test Method/ Standard	Unit	Results obtained	Specified Requirements (*)
7.	Heavy metals concentration				
a	Arsenic (As)	ISO 17088: 2021	mg/kg	1.58	10
b	Cadmium (Cd)			BDL (DL-0.25ppm)	5
c	Chromium (Cr)			47.79	50
d	Copper (Cu)			10.05	300
e	Lead (Pb)			6.80	100
f	Nickel (Ni)			26.11	50
g	Zinc (Zn)			36.07	1000

• **BDL:** Below Detection Limit, **DL:** Detection Limit.

(*) – Based on the solid waste management Rules, 2016 notified on 08th April 2016 by Ministry of Environment, Forests & Climate Change, Government of India.

PART D: REMARKS: NIL

- Note:**
1. This Test Report / Certificate is issued only for the samples submitted to CIPET:SARP-LARPM.
 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 CIPET:SARP-LARPM within 30 days from the date of issue.
 6. Subcontracted Tests (if any): Nil.



Sample under testing

** End of the Report **

Pinaki Chatterjee
Mr. Pinaki Chatterjee
(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY

Akshaya Kumar Palai
Dr. Akshaya Kumar Palai
(Quality Manager)
AUTHORISED SIGNATORY

OBSERVATION FOR BIODEGRADABILITY TEST AS PER ISO 17088:2021

To

M/s. ITC Limited Paperboards & Specialty papers Division,
Unit-Bollaram, Anrich Industrial Estate,
Bollaram Village, Jinnarammandal,
Sangareddy, Telangana - 502325

Date of Initiation : 24.06.2024

Date of Completion : 14.03.2025

1. Sample detail: "FILOBOWL/FILOBEV PREMIUM/FILOBEV MINI, Sample ID: A"- as stated by the party.

2. Material Identification by DSC & FTIR: DSC & FTIR graph indicates the base material of the supplied sample is Paper sample (Cellulose material) with one side ethylene- acrylic based dispersion coating.

3. Observation: -

a. Conditions of reaction mixtures

Origin of compost: Vermicompost, Garden Waste & Municipality Waste.

Reaction Temperature : 58°C ($\pm 2^\circ\text{C}$)

Dry Solid : 53.19(%)

Volatile Solid : 32.83(%)

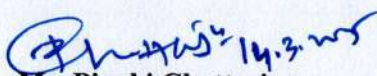
Test duration : 161 days

Reference material : Cellulose

Volume of reaction vessel : 3000 ml

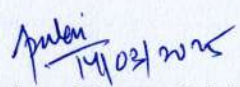
b. pH of test medium:-

Sl. No.	Composting Vessel	pH(before)	pH(After)
1	Blank 1	7.6	7.5
2	Blank 2	7.7	7.6
3	Blank 3	7.8	7.7
4	Cellulose1	7.5	7.6
5	Cellulose2	7.7	7.5
6	Cellulose3	7.6	7.4
7	Negative 1	7.4	7.4
8	Negative 2	7.8	7.7
9	Negative3	7.6	7.5
10	Sample 1	7.4	7.4
11	Sample 2	7.7	7.6
12	Sample 3	7.6	7.5


Mr. Pinaki Chatterjee

(Technical Manager)

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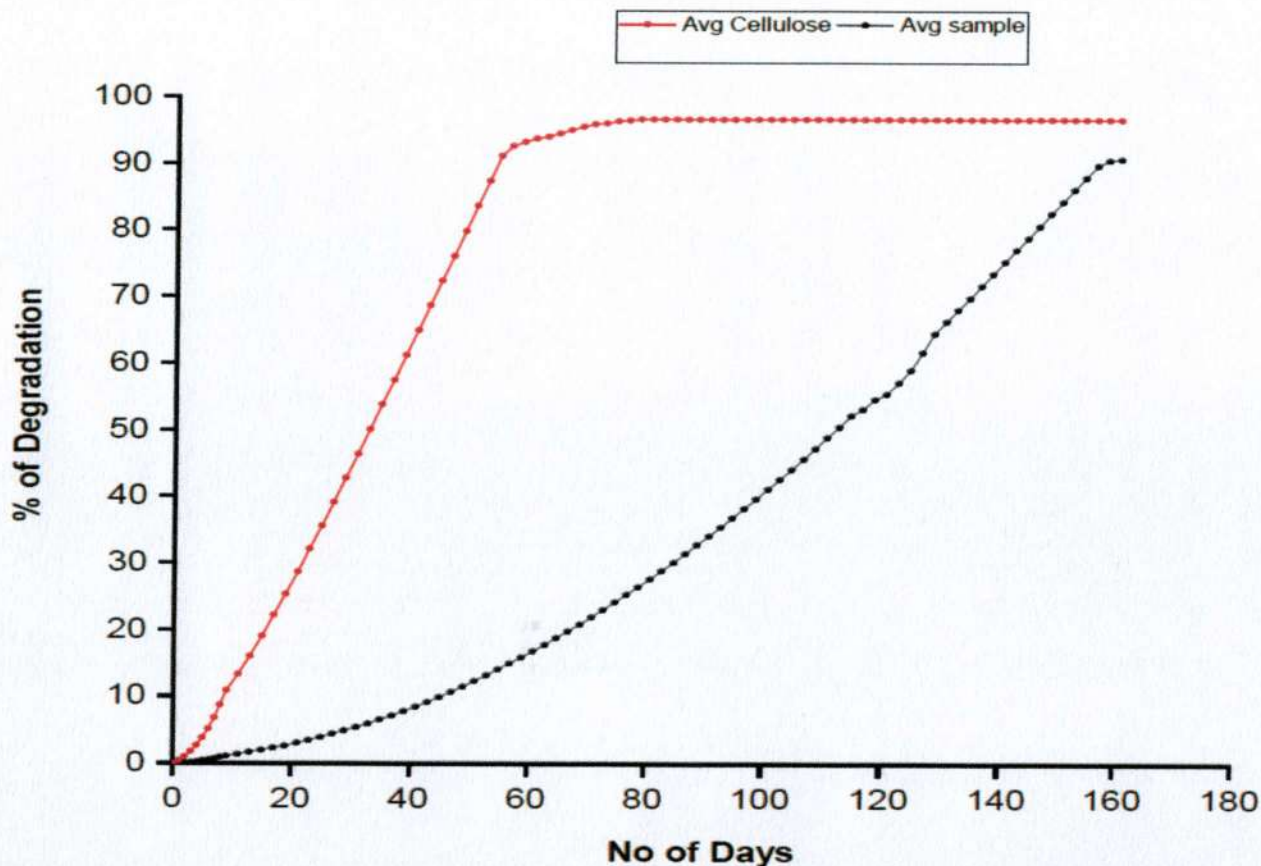

Dr. Akshaya Kumar Palai
(Quality Manager)

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4. Result: Percentage biodegradation relative to positive reference

MEAN(%) : 90.71 %

The reference material-cellulose (%) : 100



5. Visual Observation:-

	Week 1	Week 2	Week 3	Week 4	Week 5
Structure	Paper Sample	Paper Sample	Paper Sample	Paper Sample	Paper Sample
Moisture	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level
Color	White	White	White	White	White
Fungal Development	None	None	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like

Pinaki Chatterjee
Mr. Pinaki Chatterjee
(Technical Manager)

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Dr. Akshaya Kumar Palai
(Quality Manager)
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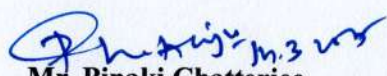
TR.NO. -01612

ANALYSIS RESULT

	Week 6	Week 7	Week 8	Week 9	Week 10
Structure	Paper Sample	Paper Sample	Disintegration initiated	Disintegration observed	Disintegration observed
Moisture	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level
Color	White	White	Faded White	Faded White	-----
Fungal Development	None	None	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like

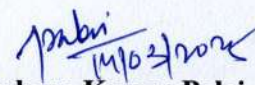
	Week 11	Week 12	Week 13	Week 14	Week 15
Structure	Disintegration observed	Disintegration observed	Disintegration observed	Disintegration observed	Disintegration observed
Moisture	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level
Color	---	---	----	---	---
Fungal Development	None	None	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like

	Week 16	Week 17	Week 18/19	Week 20/21	Week 22/23
Structure	Disintegration observed	Disintegration observed	Disintegration observed	Disintegration observed	Disintegration observed
Moisture	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level
Color	---	---	---	---	---
Fungal Development	None	None	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like



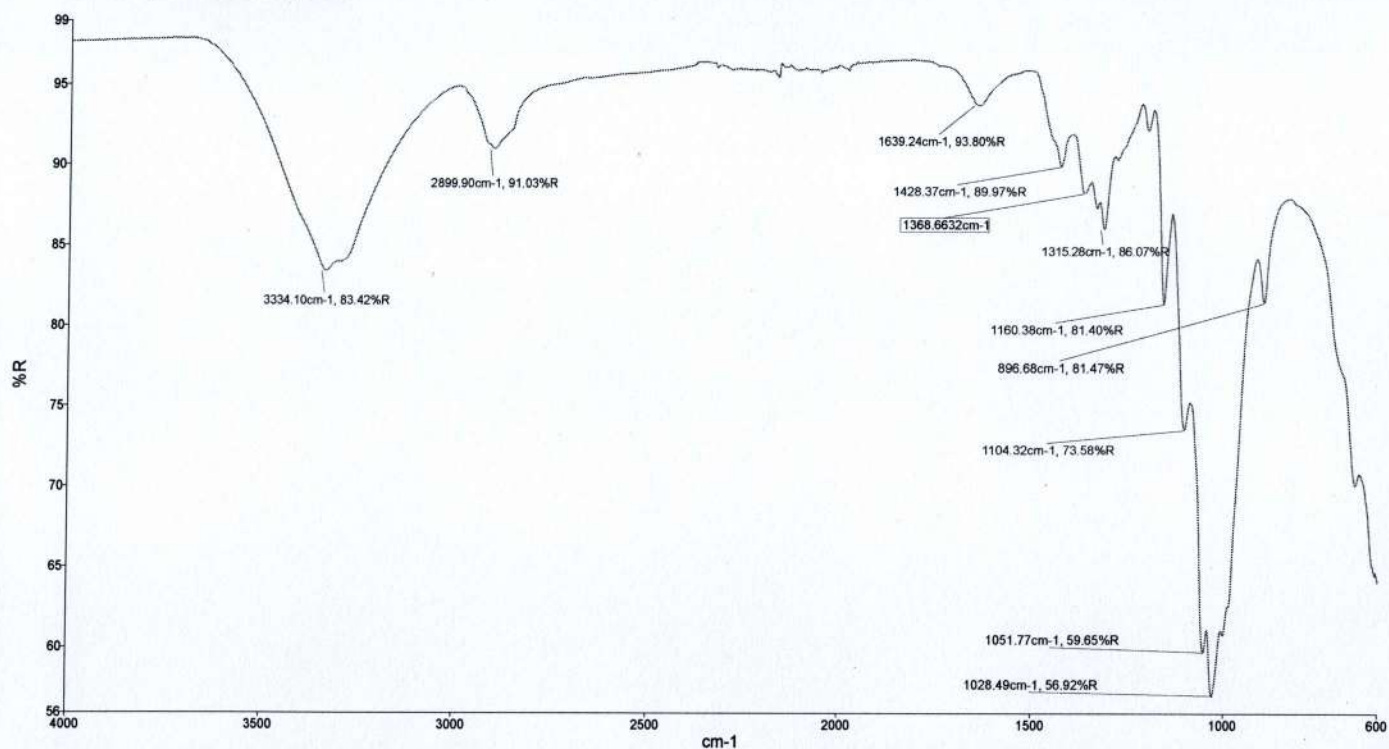
Mr. Pinaki Chatterjee
(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY



Dr. Akshaya Kumar Palai
(Quality Manager)

AUTHORISED SIGNATORY

6. FTIR Analysis:-

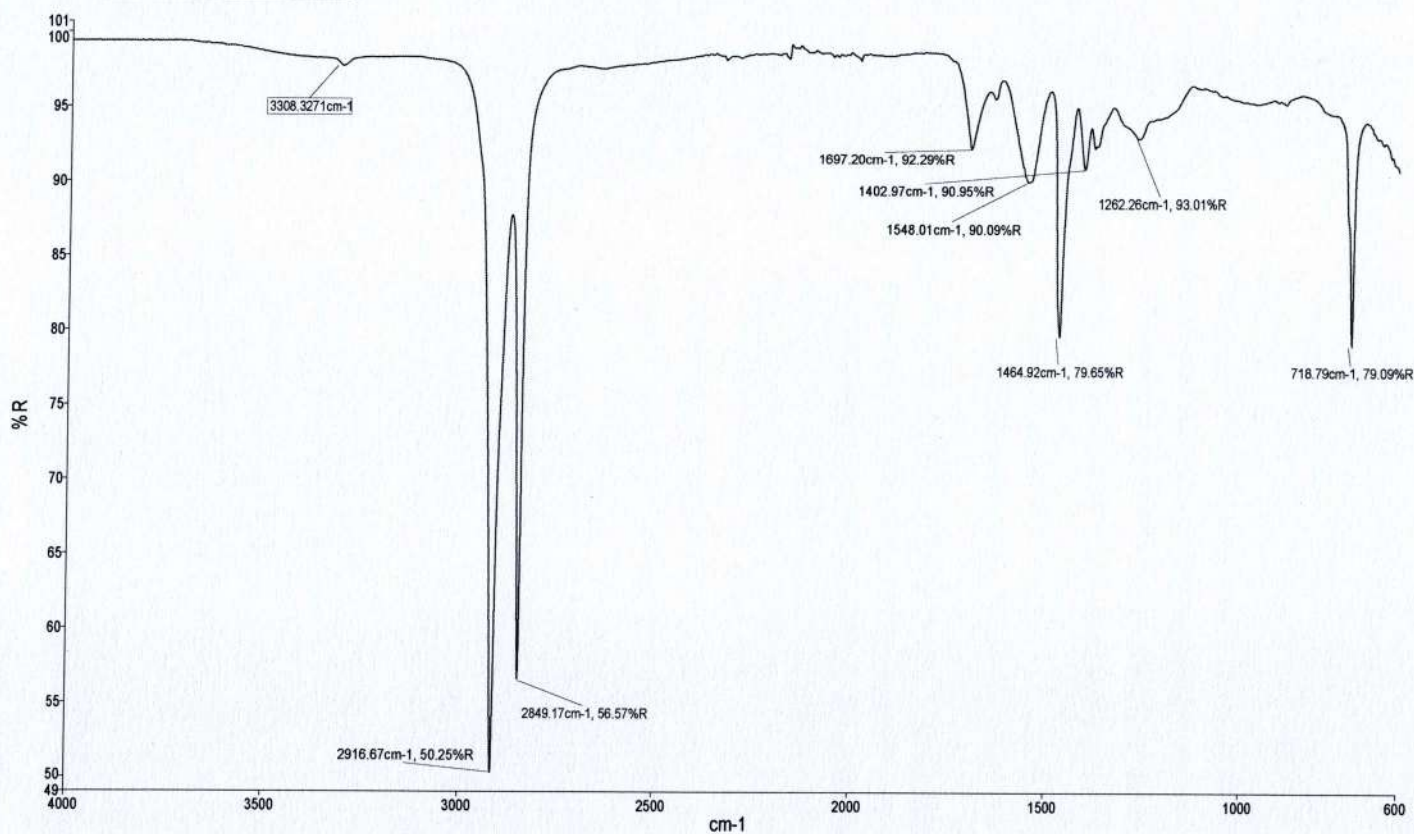
Wave number (cm ⁻¹)	Possible Nature of Bond
3334.10	OH Stretch
2899.90	CH Stretch
1428.37	CH ₂ Bend
1028.49	C-O Stretch

Pinaki Chatterjee
Mr. Pinaki Chatterjee

(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY

Akshaya Kumar Palai
Dr. Akshaya Kumar Palai
(Quality Manager)
AUTHORISED SIGNATORY

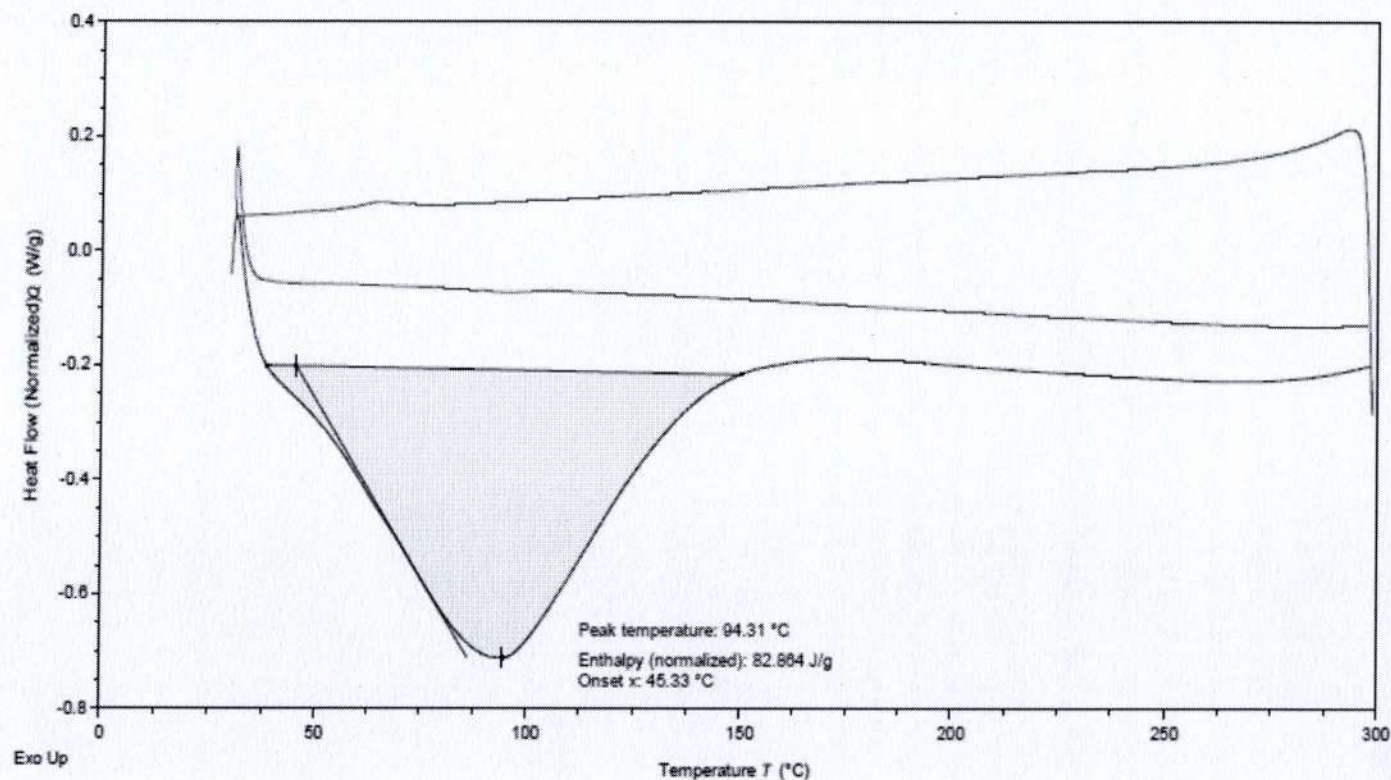
6.1 FTIR Analysis:-

Wave number (cm ⁻¹)	Possible Nature of Bond
2916.67, 2849.17	CH Stretch
1697.20	C=O Stretch
1464.92	CH ₂ Bend
718.79	CH ₂ Rock

Pinaki Chatterjee
Mr. Pinaki Chatterjee
 (Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY

Akshaya Kumar Palai
Dr. Akshaya Kumar Palai
 (Quality Manager)
 AUTHORISED SIGNATORY

7. DSC Analysis:-

Comment: DSC & FTIR graph indicates the above sample is Paper sample (Cellulose material) with one side ethylene-acrylic based dispersion coating.

Pinaki Chatterjee
14.3.2025

Mr. Pinaki Chatterjee
(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY

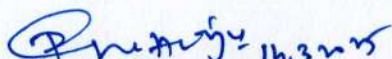
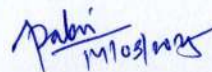
Akshaya Kumar Palai
14/03/2025

Dr. Akshaya Kumar Palai
(Quality Manager)

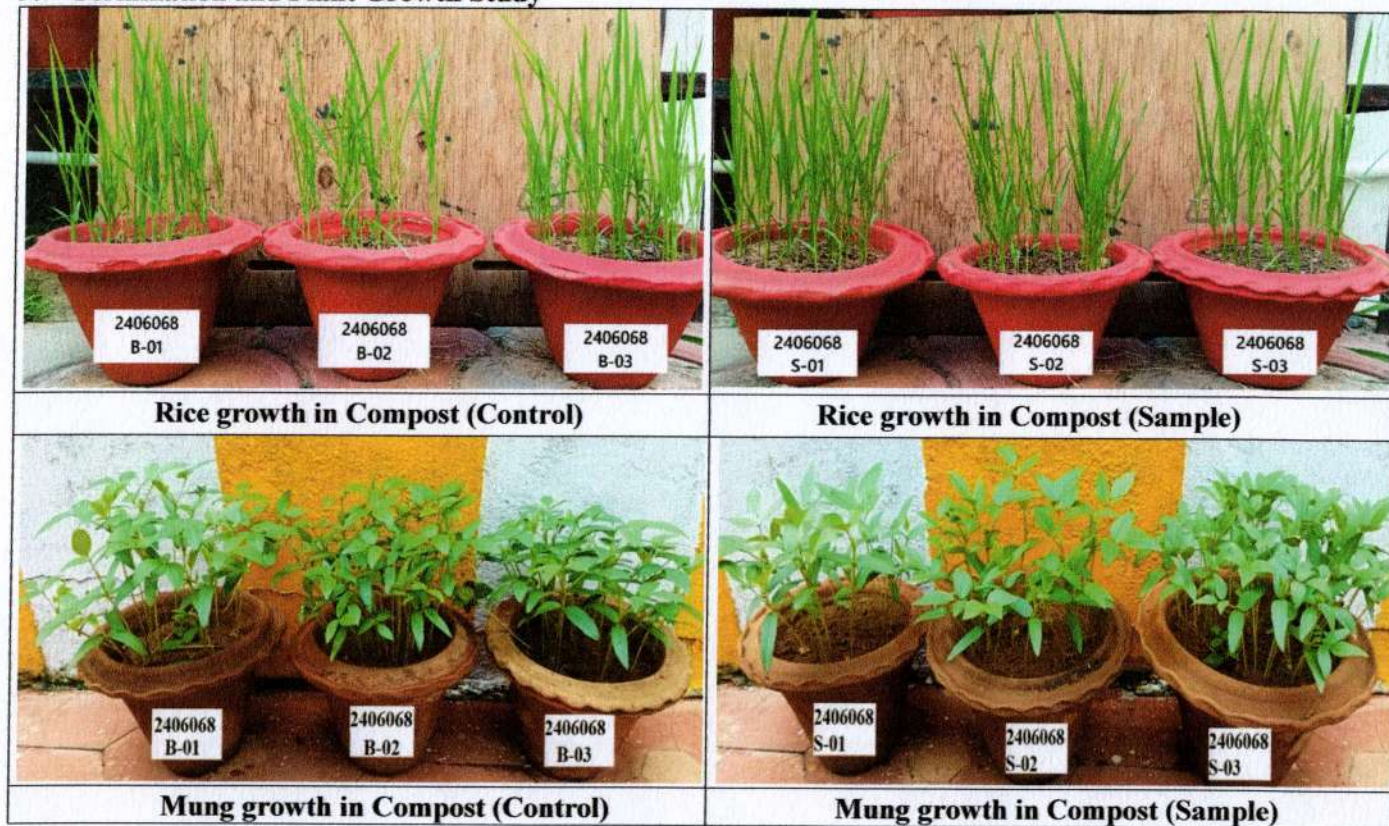
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8. DISINTEGRATION- AFTER 12 WEEKS**BEFORE DISINTEGRATION****AFTER DISINTEGRATION****Comment:-**

The disintegration of the supplied sample by passing through 2 mm sieve after 12 week in composting condition as per ISO 17088-2021 was found not more than 10% of original dry mass remain.


Mr. Pinaki Chatterjee**(Technical Manager)****REVIEWED BY & AUTHORISED SIGNATORY****Dr. Akshaya Kumar Palai
(Quality Manager)****AUTHORISED SIGNATORY**

9. Germination and Plant Growth Study



The percentage of seedling germination rate was found greater than 90% for both control and sample.

Pinaki Chatterjee
14.3.2025

Mr. Pinaki Chatterjee
(Technical Manager)

REVIEWED BY & AUTHORISED SIGNATORY

Akshaya Kumar Palai
14/03/2025

Dr. Akshaya Kumar Palai
(Quality Manager)
AUTHORISED SIGNATORY