केंद्रीय पेट्रोरसायन अभियांत्रिकी एवं प्रौद्योगिकी संस्थान(सिपेट)
(पूर्व में केंद्रीय प्लास्टिक्स इंजीनियरिंग एवं तकनीकी संस्थान)
रसायन एवं पेट्रोरसायन विभाग
रसायन एवं उर्वरक मंत्रालय, भारत सरकार
प्लॉट नं. जे - 3/2, एम.आई.डी.सी औद्योगिक क्षेत्र,
चिकलथाना, औरंगाबाद. - 431006
फोन. : 0240 -2478302-334
ईमेल : aurangabad@cipet.gov.in
वेबसाईट : www.cipet.gov.in
मुख्यालय : सिपेट, गिण्डी,चेन्नई-६०० ०३२

सिपेट CIPET

Central Institute of Petrochemicals Engineering &Technology (CIPET)
(Formerly Central Institute of Plastics Engineering & Technology)
Department of Chemicals & Petrochemicals,
Ministry of Chemicals & Fertilizers, Govt. of India
Plot No. J-3/2, MIDC Industrial Area,
Chikalthana, Aurangabad - 431006.
Tel. : 0240-2478302-334
E-mail : aurangabad@cipet.gov.in
Website : www.cipet.gov.in
Head Office : CIPET, Guindy, Chennai-600 032

Azadi Ka Amrit Mahotsav

कोरियर / स्पीड पोस्ट / बाय हेन्ड
Courier / Speed Post / By Hand

दिनांक: 15.09.2025

क्र.:सिपेट : सी एस टी एस/औ.बाद/परीक्षण/कार्य आदेश/(2115/2024-25)/2025-26/1312

प्रति,
MUKESH INDUSTRIES
G-27, MIDC Area,
Satpur, Nashik - 422007.

विषय : परीक्षण हेतु।

संदर्भ : MI/CIPET/7.

दिनांक: 21.01.2025.

महोदय,

कृपया हमारी परीक्षण रिपोर्ट क्रमांक : 33439 along with Annexure दिनांक: 15.09.2025 प्राप्त करें।

संलग्न कस्टमर फीड बैक फार्म भरकर वापस भेजने का कष्ट करें।

धन्यवाद,

भवदीय,

निदेशक एवं प्रमुख

संलग्न : उपरोक्तानुसार

सिपेट : सेन्टर फॉर स्किलिंग एण्ड टेक्निकल सपोर्ट (सी एस टी एस)
रसायन एवं पेट्रोरसायन विभाग
रसायन एवं उर्वरक मंत्रालय, भारत सरकार
प्लॉट नं. जे - 3/2, एम.आई.डी.सी औद्योगिक क्षेत्र,
चिकलथाना, औरंगाबाद. - 431006
फोन. : 0240 - 2478310,312,302
ईमेल : aurangabad@cipet.gov.in
वेबसाईट : www.cipet.gov.in
मुख्यालय : सिपेट, गिण्डी, चेन्नै–600 032

सिपेट CIPET

CIPET : CENTRE FOR SKILLING AND TECHNICAL SUPPORT (CSTS)
Department of Chemicals & Petrochemicals,
Ministry of Chemicals & Fertilizers, Govt. of India
Plot No. J-3/2, MIDC Industrial Area,
Chikalthana, Aurangabad - 431006.
Tel. : 0240-2478310,312,302
E-mail : aurangabad@cipet.gov.in
Website : www.cipet.gov.in
Head Office : CIPET, Guindy, Chennai-600 032

श्रेणी / SERIES : A

क्रं / No. 30891

प्लास्टिक्स परीक्षण केंद्र
PLASTICS TESTING CENTRE

परीक्षण रिपोर्ट/Test Report

Issued to:

MUKESH INDUSTRIES
G-27, MIDC Area,
Satpur, Nashik - 422007.

Test Report No	:	33439
Dated	:	15.09.2025
Your Ref	:	MI/CIPET/7
Dated	:	21.01.2025

Test Report

PART – A

PARTICULARS OF SAMPLE SUBMITTED

a)	Name of Sample	:	"Compostable Plastic Bag" as stated by party
b)	Grade/Variety/Type/Size/Class	:	Compostable Film - *(As indicated on letter)*
c)	Declared value, if any	:	Aliphatic-aromatic copolyester (PBAT) and Polylactic Acid (PLA) based polymer - *(As indicated on email on dtd. 30.06.2025)*
d)	Code No.	:	Nil
e)	Batch No. and Date of Manufacturing	:	Nil
f)	Quantity	:	01 kg (approx)
g)	Mode of Packing	:	Packed in plastic bag
h)	Sealed or not	:	Not Sealed
i)	Date of Receipt	:	21.01.2025
j)	Date (s) of Performance of Test	:	22.01.2025 to 12.09.2025
k)	Any other information	:	Nil

PART -B

SUPPLEMENTARY INFORMATION

i) Reference to sampling procedure	:	Samples supplied by Party
ii) Supporting documents for the measurement taken and results derived	:	As given in Part C
iii) Deviation from the test method as prescribed in relevant work instruction, if any	:	Nil

15/9/25

15.09.2025

Issued to:

MUKESH INDUSTRIES
G-27, MIDC Area,
Satpur, Nashik - 422007.

Test Report No : 33439
Dated : 15.09.2025
Your Ref : MI/CIPET/7
Dated : 21.01.2025

PART-C

Test Result

Sl. No	Name of test	Test Method	Unit	Test Result	Specified requirements
01	Material Identification	FTIR / DSC	--	PolyLactic acid and Polybutylene Adipate co-terephthalate Based polymer	Aliphatic aromatic copolyester (PBAT) and Polylactic acid.*(As declared by party)*
02	Disintegration (Dry mass remains in 2mm sieve after 84 days)	Cl. 6.2 of IS/ISO 17088 : 2021	%	6.15	Not more than 10
03	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	Cl. 6.3 of IS/ISO 17088 : 2021	%	92.02 % (At the end 105 days)	>90% (At the end of the test period not more than 180 days)
	Plant Growth study				
04	**Monocotyledon** (corn) % Seed emergence **Dicotyledon** (chickpeas) % Seed emergence	Cl 6.4.3 IS/ISO 17088 : 2021	% %	96 92	>90 >90
05	***Acute Ecotoxic Effects of Earthworm**				
a.	Survival of adult earthworm at the end of 7 days	IS/ISO 17088 : 2021 Cl.No.6.4.4	%	100	>90
b.	Survival of adult earthworm at the end of 14 days		%	98	>90
c.	Biomass end of the 14 days		%	97	>90
06	**Chronic ecotoxic effects to earthworm**				
a.	Survival of adult earthworm at the end of 28 days	IS/ISO 17088 : 2021 Cl.No.6.4.5	%	97	>90
b.	Survival of adult earthworm at the end of 56 days		%	95	>90
c.	Offspring at the end of 56 days		%	95	>90
d.	Biomass end of the 56 days		%	96	>90

Note: The detailed observation on Biodegradability test is enclosed as Annexure.

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15.09.25

Issued to:

MUKESH INDUSTRIES
G-27, MIDC Area,
Satpur, Nashik - 422007.

Test Report No : 33439
Dated : 15.09.2025
Your Ref : MI/CIPET/7
Dated : 21.01.2025

Test Result

Sr. No.	Name of the test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements
07	***Heavy metals Concentration**				
1.	Arsenic (As)	Cl.No. 6.5.2 of IS/ISO-17088:2021	mg/l	0.0011	10
2.	Copper (Cu)			0.2590	300
3.	Nickel (Ni)			0.2106	50
4.	Zinc (Zn)			3.2497	1000
5.	Cobalt(Co)			--	--
6.	Chromium (Cr)			0.0096	50
7.	Molybdenum (Mo)			0.0010	--
8.	Mercury (Hg)			0.0000	0.15
9.	Cadmium (Cd)			0.0096	5
10.	Lead (Pb)			0.0683	100
11.	Selenium (Se)			0.0007	--

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

PART-D
Remarks: Nil

NOTE :
01 This Test Report/ Certificate are issued only for the samples submitted to the laboratory.
02 The results stated above related only to the items tested.
03 The quality of the subsequent production lot has to be ensured by the purchaser.
04 This Test Report shall not be reproduced except in full without the written approval of the laboratory.
05 Any anomaly/discrepancy in this report should be brought to the notice of the laboratory within 30 days from the date of issue.
06 Subcontracted Tests (if any): *Heavy metals Concentration Test Subcontracted from CIPET: SARP (APDDRL), Bengaluru.

Reviewed by / Authorized Signatory
M.V. Kranthi Kumar
Sr. Tech. Asst.

Authorized Signatory
Kirankumar V. Koli
Technical Officer

Annexure

ANALYSIS RESULT

Test Report No. : 33439

Dated. 15.09.2025

OBSERVATION FOR BIODEGRADABILITY TEST AS PER ISO 17088: 2021

Name of the Party : -

MUKESH INDUSTRIES
G-27, MIDC Area,
Satpur, Nashik - 422007.

Customers Details

1. Sample Details (As stated the party) : Compostable Plastic Bag (Compostable film) -*(As indicated on letter)*

2. Material Identification by FTIR & DSC : PolyLactic acid and Polybutylene Adipate co-terephthalate Based polymer

3. Observation:

a. Conditions of reaction mixtures

Origin of Compost	:	Livestock excrement, municipal & vegetable
Reaction Temperature	:	58°C (±2°C)
Dry Solid (%)	:	52.72 %
Volatile Content (%)	:	44.75 %
CO_2 evolved during first 10days in blank vessels	:	75.07 mg/g of volatile solids of compost.
Test duration	:	105 days
Reference material	:	Cellulose
Volume of reaction vessel	:	3000ml

b. pH of test Medium:

Sr. No.	Composting vessel	pH (before)	pH (after)
1	Blank 1	7.5	7.0
2	Blank 2	7.5	7.5
3	Blank 3	7.0	7.0
4	Cellulose 1	8.0	7.5
5	Cellulose 2	7.5	8.0
6	Cellulose 3	7.0	7.5
7	Negative 1	7.5	7.5
8	Negative 2	7.0	7.0
9	Negative 3	7.5	7.0
10	Sample-1	7.5	7.5
11	Sample -2	7.0	7.0
12	Sample – 3	8.0	7.5

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15.09.2025
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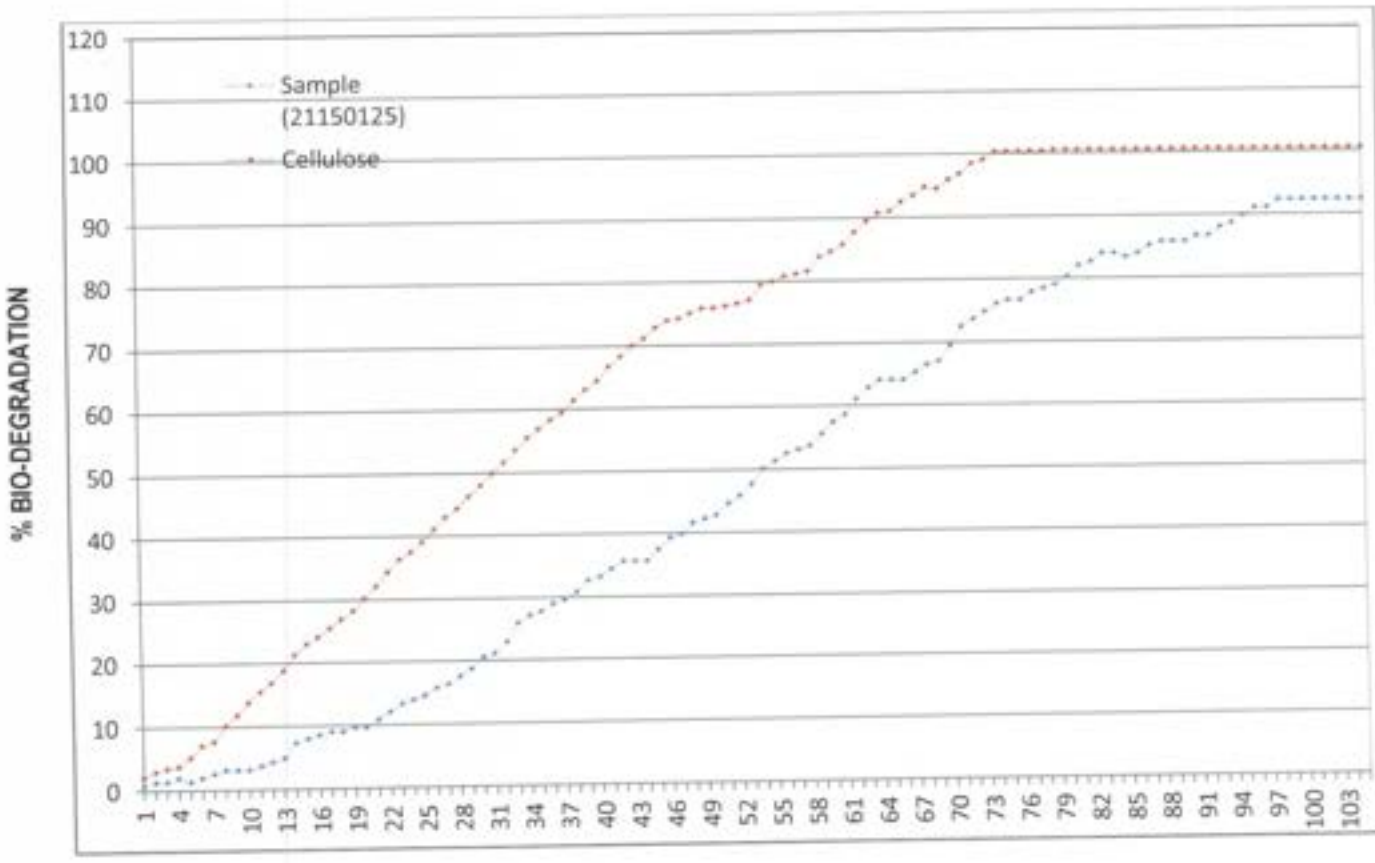
ANALYSIS RESULT

Test Report No. : 33439

4. Result: Percentage Biodegradation relative to positive reference

Mean (%): 92.02 %

The Reference material-cellulose (%): 100 %



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ANALYSIS RESULT

Test Report No. : 33439

5) Visual Observation of sample:

Description	Week 1/2	Week 3/4	Week 5/6	Week 7/8
Structure	Square shape	Square shape	Cracks on surface	Broken into pieces
Moisture	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level
Colour	White (off white) colour	Cream (off white) colour	Light brown colour	light Brown
Fungal Development	None	None	None	None
Smell	No smell	No smell	Organic/Dirt like	Organic/Dirt like
Description	**Week 9/10**	**Week 11/12**	**Week 13/14**	**Week 15**
Structure	Broken into the pieces	Broken into the pieces	Converted into small particles	small pieces well mixed with compost
Moisture	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level
Colour	Dark Brown	Dark Brown	Dark Brown	Dark Brown
Fungal Development	None	None	None	None
Smell	Organic/Dirt like	Organic/Dirt like	Organic/Dirt like	Organic/Dirt like

5) Visual Observation of Compost:

Description	Week 1/2	Week 3/4	Week 5/6	Week 7/8
Structure	Fine Particles	Fine Particles	Fine Particles	Fine Particles
Moisture	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level
Colour	Dark brown	Dark brown	Dark brown	Dark brown
Fungal Development	None	None	None	None
Smell	No smell	No smell	Organic/Dirt like	Organic/Dirt like
Description	**Week 9/10**	**Week 11/12**	**Week 13/14**	**Week 15**
Structure	Fine Particles	Fine Particles	Fine Particles	Fine Particles
Moisture	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level	Appropriate Moisture level
Colour	Dark brown	Dark brown	Dark brown	Dark brown
Fungal Development	None	None	None	None
Smell	Organic/Dirt like	Organic/Dirt like	Organic/Dirt like	Organic/Dirt like

15/9/25
Authorized Signatory

15.09.25
Authorized Signatory

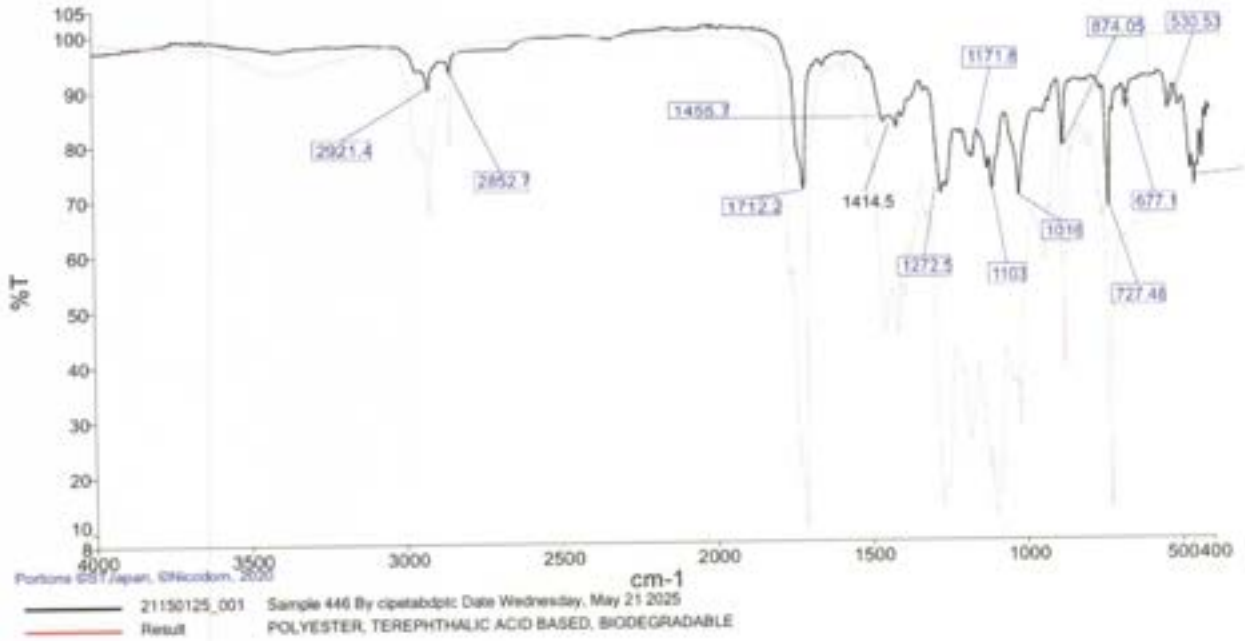
ANALYSIS RESULT

Test Report No. : 33439

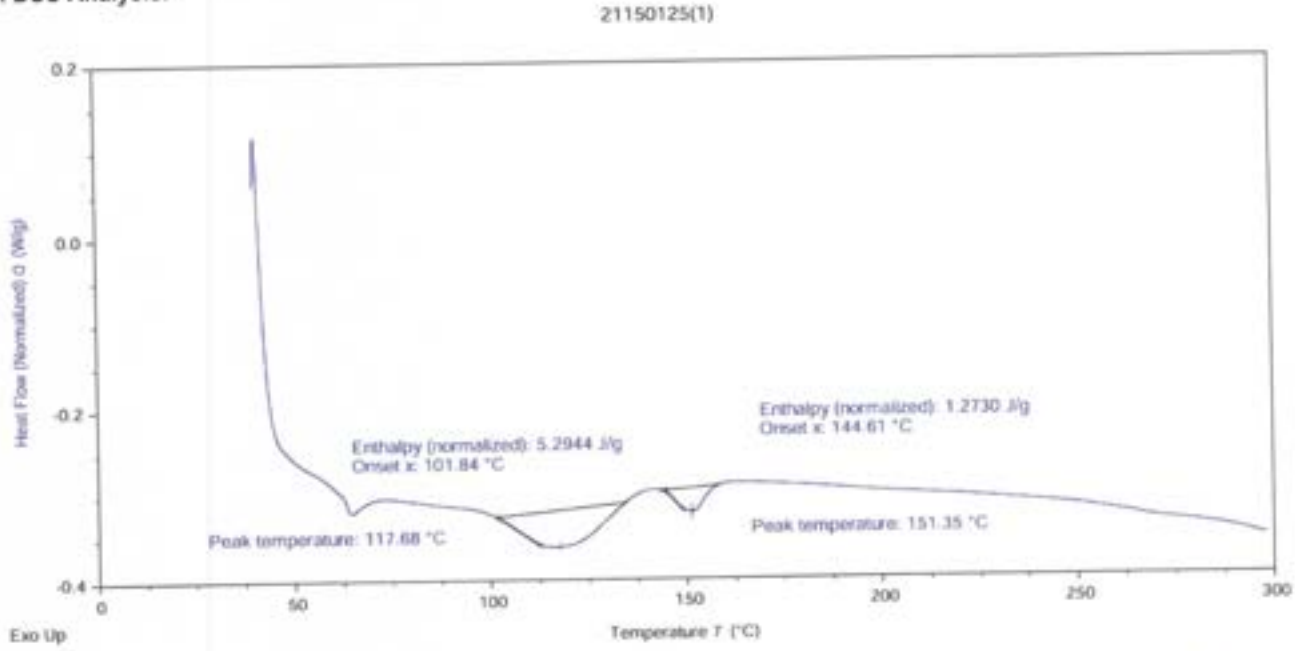
Dated. 15.09.2025

6. FTIR Analysis: PolyLactic acid and Polybutylene Adipate co-terephthalate Based polymer .

Sample Details: Aliphatic aromatic co-polyester (PBAT) and Polylactic acid - as stated by the party



7. DSC Analysis:



Comments: The above DSC & FTIR analysis indicates the submitted sample is PolyLactic acid and Polybutylene Adipate co-terephthalate Based polymer .

15/9/25

Authorized Signatory

15.9.2025

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ANALYSIS RESULT

Test Report No. : 33439

Dated. 15.09.2025

8. DISINTEGRATION – AFTER 15 WEEKS

BEFORE DISINTEGRATION

AFTER DISINTEGRATION

The disintegration of the supplied sample by passing through 2mm sieve after 15 week in composting condition as per - IS/ISO 17088: 2021 was found not more than 10% of original dry mass remain.

15/9/25

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ANALYSIS RESULT

Test Report No. : 33439

Dated. 15.09.2025

9. GERMINATION AND PLANT GROWTHSTUDY

COMPOST + SAMPLE (DICOT)

COMPOST (DICOT)

COMPOST + SAMPLE (MONOCOT)

COMPOST (MONOCOT)

The Percentage of Seed Germination rate is found to be greater than 90% for both **Compost** and **Sample.**

15/9/25

Authorized Signatory

15.09.2025

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