

सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)

स्वायत्र एवं पेट्रोस्वायत्र विभाग

स्वायत्र एवं उर्वरक मंत्रालय, भारत सरकार

प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.

दूरभाष : (079) 40103900-902, 925 फॉक्स : (079) 40083905

ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in

वेबसाईट : www.cipet.gov.in

मुख्यालय : सिपेट, गिर्धी, चेन्नै - 600 032.



## CIPET : INSTITUTE OF PLASTICS TECHNOLOGY (IPT)

Department of Chemicals & Petrochemicals

Ministry of Chemicals & Fertilizers, Govt. of India

Plot No. 630, Phase-IV, G.I.D.C., Vatva,

Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905

E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in

Web.: www.cipet.gov.in

Head Office : CIPET, Guindy, Chennai - 600 032

2703

S.L. No.

### PLASTICS TESTING CENTRE

Series : I ANALYSIS REPORT

TEST CERTIFICATE

Issued to : M/S .Himalaya Greens-Sirmour  
Shop No. 10, Below Hotel Prem Nisarga,  
Nahan, Dist. Sirmour  
Sirmour- 173 001  
Phone No. 7730000012  
E-mail: himalayagreens@gmail.com

Test Report as per Standard : As per part C

Test Report No : 2768

Dated : 20.07.2021

Your Ref. No. : NIL

Dated : 27.11.2020

### PART A

ULR No. TC816421000001742P

#### PARTICULARS OF SAMPLE SUBMITTED

- |   |                             |
|---|-----------------------------|
| a) Name of the sample(as stated by the party)                     | : Compostable Film Material |
| b) Grade/Variety/Type/Size/Class etc.                             | : ---                       |
| c) Code No.   | : ---                       |
| d) Quantity (pcs/mtr/gm/nos)                                      | : 2.5 Kg                    |
| e) Mode of packing<br>(Sealed carton/poly pouch/container or not) | : Individual Packs          |
| f) Date of receipt of sample                                      | : 27.11.2020                |
| g) Date of Performance of test                                    | : 14.12.2020                |
| h) Any other information  | : ---                       |

### PART B SUPPLEMENTARY INFORMATION

- |  |                                 |
|--|---------------------------------|
| a) Reference to sampling procedure   | : Drawn & supplied by the party |
| b) Supporting documents for Measurements<br>Taken and results derived like graphs,<br>Tables, sketches and/or Photographs as<br>appropriate to test report if any (to be attached) | : As per Part C                 |
| c) Deviation from the test methods as<br>Prescribed in relevant ASTM/ISO/BIS/<br>Work instructions, if any   | : Not Applicable                |

AUTHORISED SIGNATORY

AUTHORISED SIGNATORY

Page 1 of 10

सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)

रसायन एवं पेट्रोरसायन विभाग  
रसायन एवं उत्करक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
फूरमार्श : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिरणी, चेन्नै - 600 032.



## CIPET : INSTITUTE OF PLASTICS TECHNOLOGY (IPT)

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

### PLASTICS TESTING CENTRE

#### ANALYSIS REPORT

Report No.: 2768

Date : 20.07.2021

#### PART C TEST RESULTS

Sr. No.	Name of the Test	Test Method/Standard	Unit	Results obtained	Specified Requirements
<b>Sample Details :Compostable Film Material (As stated by the party)</b>					
1.	Material Identification	FTIR/DSC	--	Blends of PLA/PBAT	-----
2.	Disintegration(Dry mass passing through 2 mm sieve after 84 days)	IS 17088:2008	%	9.3	Not more than 10%
3.	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	IS 17088:2008	%	91.84	>90 (At the end of the test period not more than 180 days)
4.	Plant growth study <b>Monocotyledon(Rice)</b> % Seed emergence  <b>Dicotyledon(tomato)</b> % Seed emergence	IS 17088:2008	%	97.5	>90
			%	92.5	>90

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

  
AUTHORISED SIGNATORY

  
AUTHORISED SIGNATORY

Page 2 of 10

**सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)**

रसायन एवं पेट्रोरसायन विभाग  
रसायन एवं उर्वरक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिर्जी, चेन्नै - 600 032.



**CIPET : INSTITUTE OF PLASTICS  
TECHNOLOGY (IPT)**

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

**PLASTICS TESTING CENTRE**

**ANALYSIS REPORT**

**Report No.: 2768  
Date : 20.07.2021**

**PART C  
TEST RESULTS**

Sr no	Name of the Test	Test Method/Standard	Unit	Results obtained	Specified requirements
5.	Heavy metals concentrations #	ISO 17088:2012/ IS 17088:2008	Mg/l		
i.	Arsenic (As)		B.L.Q (Q.L=0.05)	20	
ii.	Copper (Cu)		2.67	500	
iii.	Nickel (Ni)		0.17	100	
iv.	Zinc (Zn)		9.44	2500	
v.	Cobalt (Co)		B.L.Q (Q.L=0.05)	----	
vi.	Chromium (Cr)		0.37	300	
vii.	Molybdenum (Mo)		B.L.Q (Q.L=0.05)	----	
viii.	Mercury (Hg)		B.L.Q (Q.L=0.05)	10	
ix.	Cadmium (Cd)		B.L.Q (Q.L=0.05)	20	
x.	Lead (Pb)		0.97	500	
xi.	Selenium (Se)		B.L.Q (Q.L=0.05)	----	

\*Based on Municipal waste (Management and Handling) Rules, 1999 notified on 27<sup>th</sup> September, 1999 by Ministry of Environment and Forests, Government of India. Note that Concentration of Metals like Cobalt, Molybdenum, and Selenium is not mentioned in the notification.

**PART D**

**REMARKS : Nil**

**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 from the date of issue.
6. Subcontracted Tests (if any): # Gujarat Laboratory

**AUTHORISED SIGNATORY**

**AUTHORISED SIGNATORY**

Page 3 of 10

सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)

रसायन एवं पेट्रोरसायन विभाग  
रसायन एवं उर्बरक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिरणी, चेन्नै - 600 032.



## CIPET : INSTITUTE OF PLASTICS TECHNOLOGY (IPT)

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

### PLASTICS TESTING CENTRE

#### ANALYSIS REPORT

Report No.: 2768  
Date : 20.07.2021

#### Annexure-I

#### OBSERVATION FOR BIODEGRADABILITY TEST AS PER IS /ISO 17088:2008

##### Customers Details:

Name of the Party :- Himalaya Greens -Sirmour

1. Sample Details :- Compostable Film Material (As declared by the party)

2. Material Identification by FTIR &DSC : Blends of Polylactic Acid (PLA) /  
Polybutyleneadipate co-terephthalate (PBAT)

##### 3. Observation:-

###### a) Conditions of reaction mixtures

Origin of Compost : Livestock excreta, municipal and vegetable waste

Reaction Temperature : 58° (±2°C)

Dry Solid : 54.9%

Volatile Solid : 38.9%

CO<sub>2</sub> evolved during 1<sup>st</sup> 10 days

in blank vessels : 50.9 mg/g of volatile solids of compost

Test Duration : 143 Days.

Reference Material : Cellulose.

Volume of reaction vessel : 3000ml.

###### b) pH of Test medium

Sl. No.	Composting Vessel	pH (before test)	pH (after test)
1	Blank 1	8.0	8.5
2	Blank 2	7.4	7.6
3	Blank 3	7.2	7.0
4	Cellulose 1	8.2	8.0
5	Cellulose 2	7.6	7.4
6	Cellulose 3	7.8	8.0
7	Negative 1	7.9	8.3
8	Negative 2	7.3	7.6
9	Negative 3	8.3	8.1
10	Sample 1	7.7	8.0
11	Sample 2	8.3	8.3
12	Sample 3	8.1	8.2

AUTHORISED SIGNATORY

AUTHORISED SIGNATORY

Page 4 of 10

**सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)**

स्थायन एवं प्रैदूर्यस्थायन विभाग  
स्थायन एवं उत्तरक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिर्जी, चेन्नै - 600 032.



**CIPET : INSTITUTE OF PLASTICS  
TECHNOLOGY (IPT)**

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

**PLASTICS TESTING CENTRE**

**ANALYSIS REPORT**

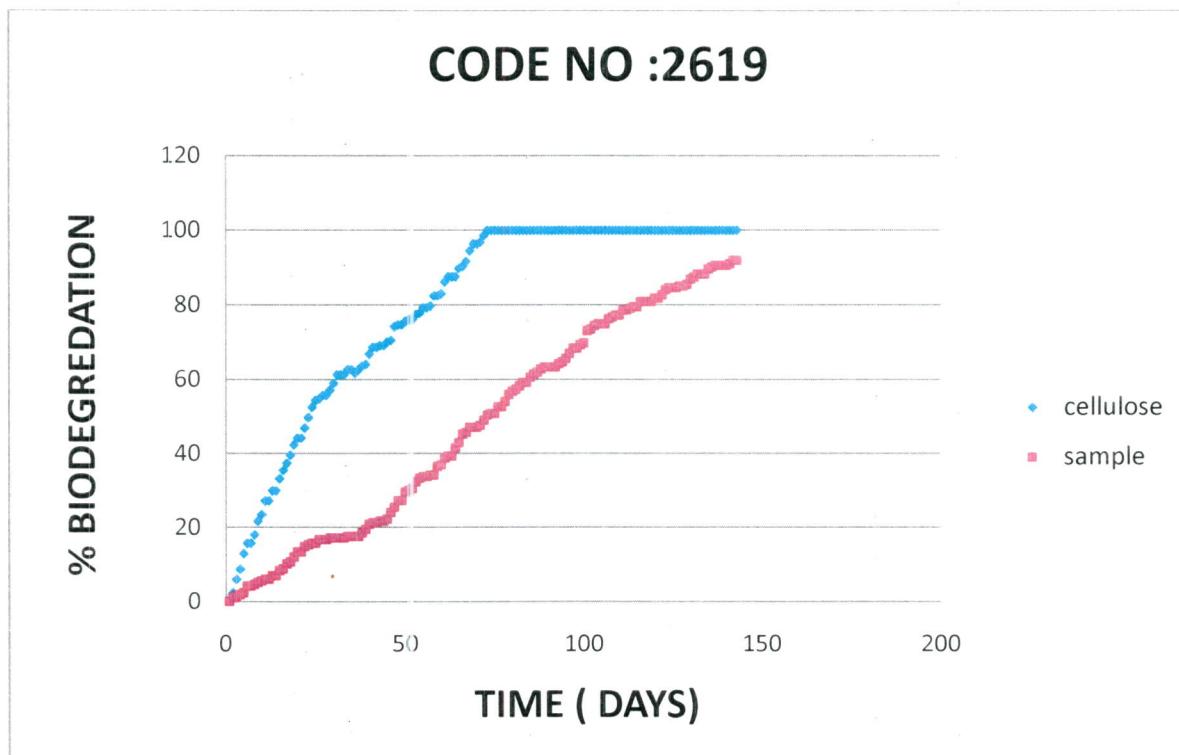
**Report No.: 2768**

**Date : 20.07.2021**

**4. Result:** Percentage biodegradation relative to positive reference

**MEAN (%) : 91.84%**

The reference material- Cellulose (%) : 100%



  
**AUTHORISED SIGNATORY**

  
**AUTHORISED SIGNATORY**

Page 5 of 10

**सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स**  
**टेक्नोलॉजी (आई.पी.टी.)**

रसायन एवं पेट्रोरसायन विभाग  
रसायन एवं उर्वरक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिर्जी, चेन्नै - 600 032.



**CIPET : INSTITUTE OF PLASTICS  
TECHNOLOGY (IPT)**

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.  
Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

**PLASTICS TESTING CENTRE**

**ANALYSIS REPORT**

**Report No.: 2768**

**Date : 20.07.2021**

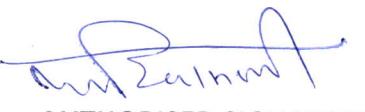
**5. Visual Observation of Sample**

Description	Week 1	Week 5	Week 12	Week 16	Week 21
<b>Structure</b>	Film sample				
<b>Moisture</b>	Adequate moisture level				
<b>Colour</b>	Milky white	Milky white	Milky white	Faded white	----
<b>Fungal Development</b>	Nil	Nil	Nil	Nil	Nil
<b>Smell</b>	Organic /dirt like				

**6. Visual Observation of Compost**

Description	Week 1	Week 5	Week 12	Week 16	Week 21
<b>Structure</b>	Fine Particles				
<b>Moisture</b>	Adequate moisture level				
<b>Colour</b>	Dark Brown				
<b>Fungal Development</b>	Nil	Nil	Nil	Nil	Nil
<b>Smell</b>	Organic/dirt like				

  
**AUTHORISED SIGNATORY**

  
**AUTHORISED SIGNATORY**

सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)

रसायन एवं पेट्रोरसायन विभाग  
रसायन एवं उर्वरक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिरणी, चेन्नै - 600 032.



## CIPET : INSTITUTE OF PLASTICS TECHNOLOGY (IPT)

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

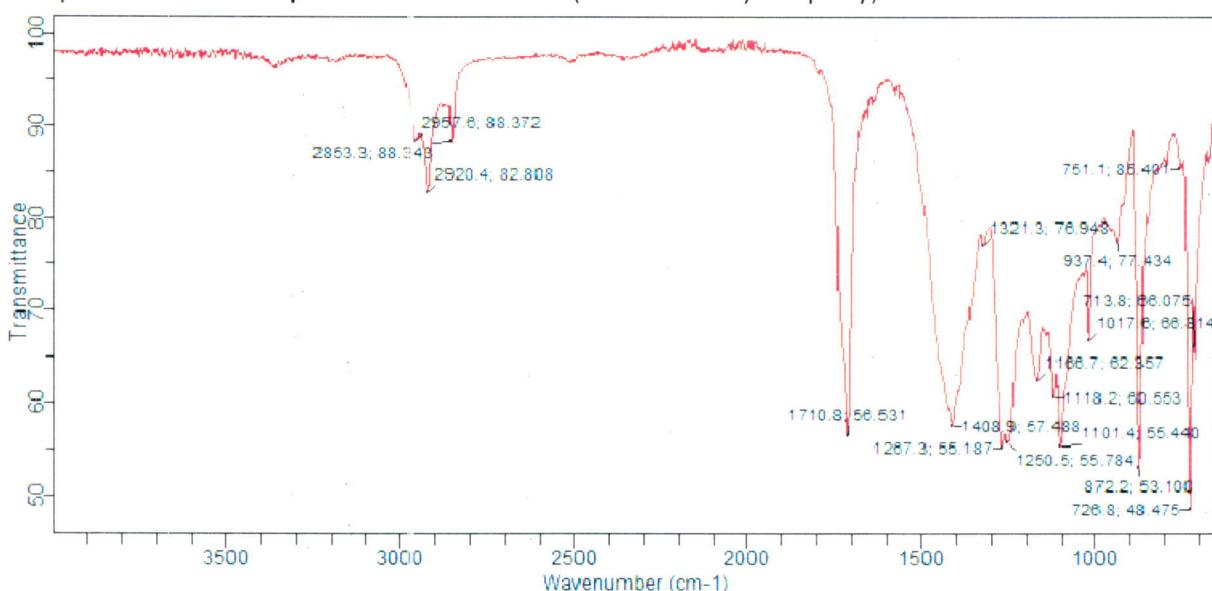
### PLASTICS TESTING CENTRE

#### ANALYSIS REPORT

Report No.: 2768  
Date : 20.07.2021

#### 7. FTIR Analysis

Sample Details: :- Compostable Film Material (As declared by the party)



Wave number ( $\text{cm}^{-1}$ )	Nature of Bond
1) 2920.4	C – H Stretching vibrations
2) 1710.8	C = O Stretching vibrations
3) 1408.9	C – H Bending vibrations
4) 1166.7	C – O Stretching vibrations
5) 726.8	C – H Bending vibrations

  
AUTHORISED SIGNATORY

  
AUTHORISED SIGNATORY

Page 7 of 10

सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)

रसायन एवं पेट्रोरसायन विभाग  
रसायन एवं उत्तरक मंत्रालय, भारत सरकार  
प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., वटवा, अहमदाबाद - 382 445.  
दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905  
ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in  
वेबसाईट : www.cipet.gov.in  
मुख्यालय : सिपेट, गिर्जी, चेन्नै - 600 032.



## CIPET : INSTITUTE OF PLASTICS TECHNOLOGY (IPT)

Department of Chemicals & Petrochemicals  
Ministry of Chemicals & Fertilizers, Govt. of India  
Plot No. 630, Phase-IV, G.I.D.C., Vatva,  
Ahmedabad - 382 445.

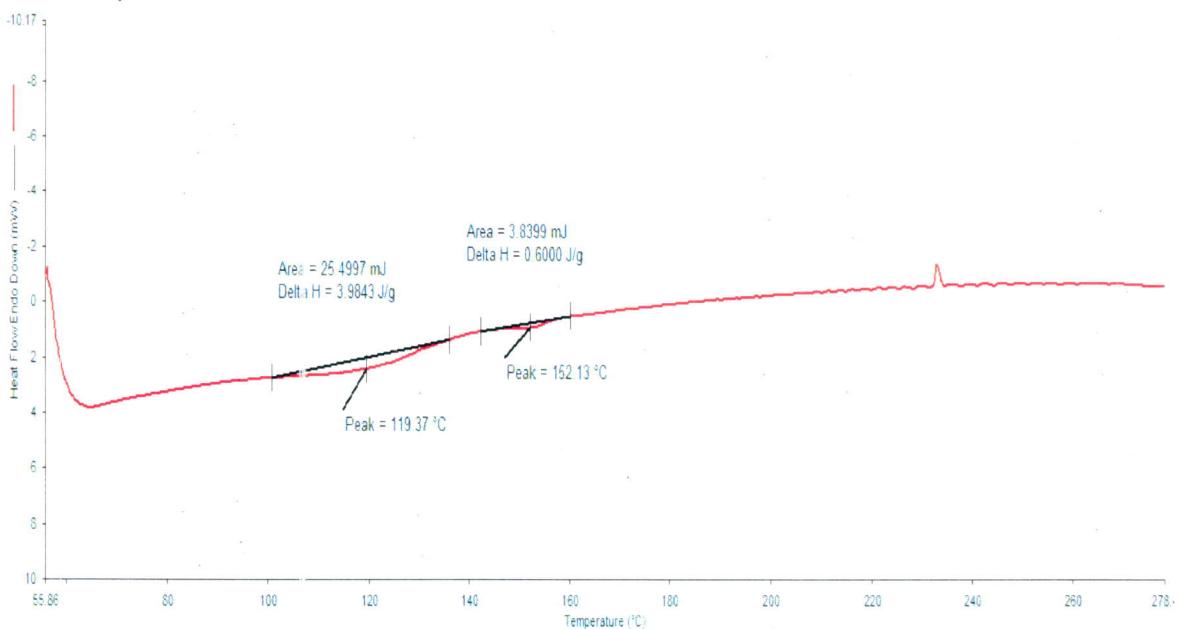
Tele : (079) 40103900-902, 925, Fax : (079) 40083905  
E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in  
Web.: www.cipet.gov.in  
Head Office : CIPET, Guindy, Chennai - 600 032

### PLASTICS TESTING CENTRE

#### ANALYSIS REPORT

Report No.: 2768  
Date : 20.07.2021

#### 8. DSC Analysis



Comment: The above DSC & FTIR analysis indicates the above sample is Blends of PLA (Polylactic acid) / PBAT (Poly butylenes adipate co-terephthalate)

  
AUTHORISED SIGNATORY

  
AUTHORISED SIGNATORY

Page 8 of 10

सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)

स्वायन एवं पेट्रोस्वायन विभाग  
स्वायन एवं उर्वरक मंत्रालय, भारत सरकार

प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., चटवा, अहमदाबाद - 382 445.

दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905

ई-मेल : cipetahmd@gmail.com | ahmedabad@cipet.gov.in

वेबसाईट : www.cipet.gov.in

मुख्यालय : सिपेट, गिरणी, चेन्नै - 600 032.



## CIPET : INSTITUTE OF PLASTICS TECHNOLOGY (IPT)

Department of Chemicals & Petrochemicals

Ministry of Chemicals & Fertilizers, Govt. of India

Plot No. 630, Phase-IV, G.I.D.C., Vatva,

Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905

E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in

Web.: www.cipet.gov.in

Head Office : CIPET, Guindy, Chennai - 600 032

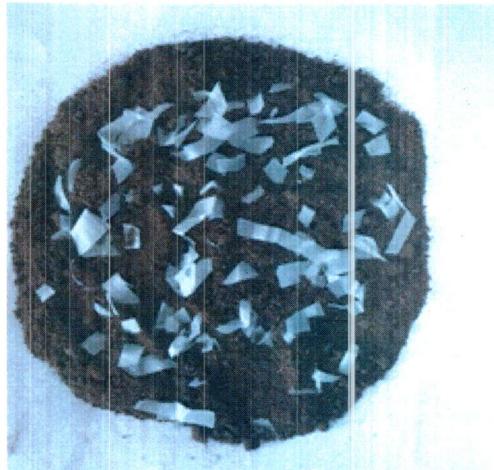
### PLASTICS TESTING CENTRE

#### ANALYSIS REPORT

Report No.: 2768

Date : 20.07.2021

#### 9. DISINTEGRATION - AFTER 12 WEEKS



BEFORE DISINTEGRATION



AFTER DISINTEGRATION

The disintegration of the sample by passing through 2 mm sieve after 12 week in composting condition as per ISO 17088-2012/IS 17088: 2008 was found not more than 10% of original dry mass remain.

AUTHORISED SIGNATORY

AUTHORISED SIGNATORY

Page 9 of 10

**सिपेट : इंस्टीट्यूट ऑफ प्लास्टिक्स  
टेक्नोलॉजी (आई.पी.टी.)**

स्वायन एवं प्रेदोस्सायन विभाग

स्वायन एवं उत्तरक मंत्रालय, भारत सरकार

प्लॉट नं. 630, फेज 4, जी.आई.डी.सी., चटवा, अहमदाबाद - 382 445.

दूरभाष : (079) 40103900-902, 925 फैक्स : (079) 40083905

ई-मेल : cipetahmd@gmail.com • ahmedabad@cipet.gov.in

वेबसाईट : www.cipet.gov.in

मुख्यालय : सिपेट, गिर्णी, चेन्नै - 600 032.



**CIPET : INSTITUTE OF PLASTICS  
TECHNOLOGY (IPT)**

Department of Chemicals & Petrochemicals

Ministry of Chemicals & Fertilizers, Govt. of India

Plot No. 630, Phase-IV, G.I.D.C., Vatva,

Ahmedabad - 382 445.

Tele : (079) 40103900-902, 925, Fax : (079) 40083905

E-mail : cipetahmd@gmail.com | ahmedabad@cipet.gov.in

Web.: www.cipet.gov.in

Head Office : CIPET, Guindy, Chennai - 600 032

**PLASTICS TESTING CENTRE**

**ANALYSIS REPORT**

**Report No.: 2768**

**Date : 20.07.2021**

**10. GERMINATION AND PLANT GROWTH STUDY**



**2619 Compost (Control)**



**2619 Compost (Sample)**



**2619 Compost (Control)**



**2619 Compost (Sample)**

The percentage of seed germination rate is found to be greater than 90% for both Monocotyledon and Dicotyledon.

**AUTHORISED SIGNATORY**

**AUTHORISED SIGNATORY**

Page 10 of 10