



Certificate No: CPCB-UPC-II/Dhanush Eco Products/
Andhra Pradesh/540

Dated: 28-05-2024

To,

M/s Dhanush Eco Products
Survey No 138/4, NH 16, Vemulavalasa, Visakahapatnam,
Andhra Pradesh 531219

Sub: Certificate to manufacturer for Manufacturing / Selling of Compostable Plastics & Carry Bags.

With reference to the application no. **Dhanush Eco Products/Andhra Pradesh/540** dated **24 May 2024** this is to certify that **M/s Dhanush Eco Products** plant located at **Survey No 138/4, NH 16, Vemulavalasa, Visakahapatnam, Andhra Pradesh 531219** is fulfilling the criteria as per revised Standard Operating Procedure (SOP) for issuing certificate as per the provisions '4(h)' & '11(c)' of Plastic Waste Management Rules, 2018, for manufacturing and selling of compostable carry bags in Indian Market as '**MANUFACTURER**'.

Certificate for manufacturing and selling of compostable plastic bags and commodities in Indian market is hereby issued to **M/s Dhanush Eco Products** plant located at **Survey No 138/4, NH 16, Vemulavalasa, Visakahapatnam, Andhra Pradesh 531219** as '**MANUFACTURER**' with the following conditions:

- The end product "**Compostable plastics**" shall be manufactured using the raw materials "**Compostable starch granules, PLA, PBAT**" and following the production process (Annexure I).
- Each carrybag and commodities made from compostable material or plastic shall bear a label "**COMPOSTABLE**" IS//ISO:17088 titled as Specifications for "Compostable Plastic" in **English & regional language**. Each carrybag and commodities shall also have printed code and Certificate Number of "**MANUFACTURER**"
- The manufacturer shall generate QR code based on the details (Name, plant address, CPCB certificate no. etc.) provided in the certificate issued by CPCB and QR code shall be provided on each of the carry bag and commodities manufactured at the certified unit. The "verifiable" details of the QR code shall be shared with the SPCB/PCC/CPCB within one month of issue of this Certificate.

Contd....2

दिव्या सिन्हा / Divya Sinha

वैज्ञानिक 'एफ' / Scientist 'F'

केन्द्रीय प्रदूषण नियंत्रण बोर्ड

Central Pollution Control Board

(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)

(Ministry of Environment, Forest & Climate Change, Govt. of India)

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- iv. This certificate issued by CPCB shall not require renewal. However, a fresh application shall be filed with CPCB for grant of certificate, in case there is any change in raw material/ production process or product.
- v. The Manufacturer shall provide six-monthly report giving details of raw material procurement and product sale to SPCB/PCC/CPCB as per the prescribed format.
- vi. The "Manufacturer" shall comply with provisions of PWM Rules / Guidelines issued from time to time by the Ministry of Environment, Forest & Climate Change or Central Pollution Control Board.
- vii. If the certified Manufacturer is found non-complying with the provisions of the PWM Rules, 2018, the Certificate shall stand cancelled



(Divya Sinha)

Director & I/c UPC-II

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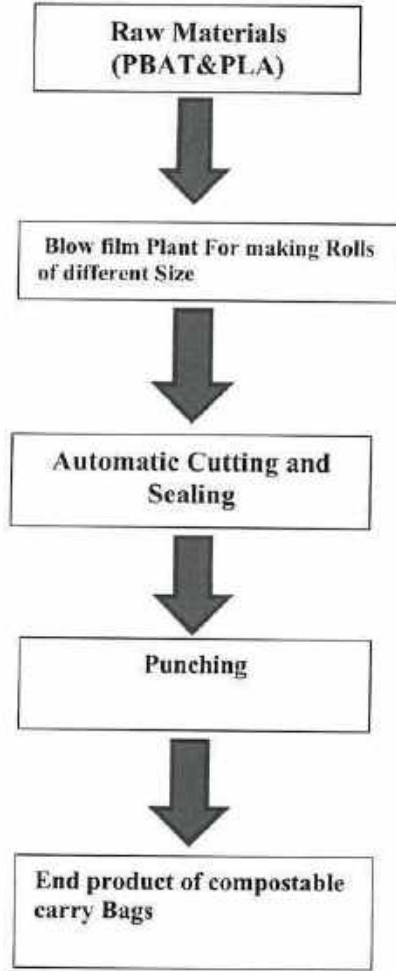
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प्राप्त दिनांक: 10/05/2023
क्रमांक: 10/05/2023
परिष्कारित दिनांक: 10/05/2023
परिष्कारित क्रमांक: 10/05/2023
परिष्कारित दिनांक: 10/05/2023
परिष्कारित क्रमांक: 10/05/2023

Process Flow Diagram



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અભિયાન - ગુજરાતનાં સુવર્ણ
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(पूर्व में केंद्रीय प्लास्टिक्स इंजीनियरिंग एवं तकनीकी संस्थान)

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प्लास्टिक परीक्षण केंद्र / PLASTIC TESTING CENTRE

श्रृंखला:श्री / Series : C **ANALYSIS REPORT** परीक्षण रिपोर्ट / TEST REPORT

क्र.सं / S.L. No. **20458**

को जारी / Issued to : **DHANUSH ECO PRODUCTS**
Survey No. 138/4, Vemulavalasa,
Anandapuram, Visakhapatnam-531219

रिपोर्ट नं / Test Report No : 2279

दिनांक / Dated : 09.02.2024

संदर्भ / Your Ref. No. : NIL

As per part C

दिनांक / Dated : 28.07.2023

मानक के अनुसार टेस्ट रिपोर्ट

Test Report as per Standard :

PART A

PARTICULARS OF SAMPLE SUBMITTED

- | | |
|---|---------------------------|
| a) Name of the sample(as stated by the party) | : Compostable Film |
| b) Grade/Variety/Type/Size/Class etc. | : --- |
| c) Code No. | : --- |
| d) Quantity (pcs/mtr/gm/nos) | : 1.5 kg. |
| e) Mode of packing
(Sealed carton/poly pouch/container or not) | : In Sealed Carton |
| f) Date of receipt of sample | : 28.07.2023 |
| g) Date of Performance of test | : 01.08.2023 |
| h) Date of Completion | : 09.02.2024 |
| i) Any other information | : --- |

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 | : Not Applicable |


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प्लास्टिक परीक्षण केंद्र / PLASTIC TESTING CENTRE

ANALYSIS REPORT

Report No.: 2279
Date : 09.02.2024

PART C
TEST RESULTS

Sr. No.	Name of the Test	Test Method/Standard	Unit	Results obtained	Specified Requirements
Sample Details : Compostable Film (As stated by the party)					
1.	Material Identification	FTIR/DSC	--	Blends of PLA/PBAT	-----
2.	Disintegration(Dry mass passing through 2 mm sieve after 84 days)	ISO 17088:2021 Cl.6.2.1	%	9.2	Not more than 10%
3.	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference	ISO 17088:2021 Cl.6.3.1	%	93.18	>90 (At the end of the test period not more than 180 days)
4.	Plant growth study- Monocotyledon(Sorghum) % Seed emergence	ISO 17088:2021 Cl.6.4.3	%	93	>90
	Dicotyledon(tomato) % Seed emergence		%	91	>90
5.	Acute Ecotoxic effects to earthworm	ISO 17088:2021		100	>90
a.	Survival adult earthworm at the end of 7 days	Cl.6.4.4			
b.	Survival adult earthworm at the end of 14 days		%	97	>90
c.	Biomass at the end of 14 days			94.50	>90
6.	Chronic Ecotoxic effects to earthworm	ISO 17088:2021		95	>90
a.	Survival adult earthworm at the end of 28 days	Cl.6.4.5			
b.	Survival adult earthworm at the end of 56 days		%	92	>90
c.	Biomass at the end of 56 days			91	>90
d.	Offspring at the end of 56 days			93	>90

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

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PART C
TEST RESULTS

Sr. no.	Name of the Test	Test Method/Standard	Unit	Results obtained	Specified requirements
7.	Heavy metals concentrations # Arsenic (As) Copper (Cu) Nickel (Ni) Zinc (Zn) Cobalt (Co) Chromium (Cr) Molybdenum (Mo) Mercury (Hg) Cadmium (Cd) Lead (Pb) Selenium (Se)	ISO 17088:2021	mg/l	0.40 8.42 3.12 38.29 0.56 5.04 0.09 B.L,Q(Q.L.=0.05) 0.30 1.35 0.36	20 500 100 2500 ---- 300 ---- 10 20 500 -----

*Based on Municipal waste (Management and Handling) Rules, 1999 notified on 27th 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

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प्लास्टिक परीक्षण केंद्र / PLASTIC TESTING CENTRE

ANALYSIS REPORT

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Date : 09.02.2024

Annexure-I

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

Customers Details:

Name of the Party :- DHANUSH ECO PRODUCTS

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

2. Material Identification by FTIR & DSC : Blends of poly lactic Acid (PLA)/ Poly Butylene Adipate 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 : 53.77 %
Volatile Solid : 38.8 %
CO₂ evolved during 1st 10 days
in blank vessels : 53.90 mg/g of volatile solids of compost
Test Duration : 120 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	7.9	8.0
2	Blank 2	8.1	7.5
3	Blank 3	8.0	8.2
4	Cellulose 1	8.3	8.0
5	Cellulose 2	8.0	8.1
6	Cellulose 3	8.1	7.6
7	Negative 1	7.6	7.5
8	Negative 2	7.9	8.1
9	Negative 3	8.0	8.2
10	Sample 1	8.4	8.5
11	Sample 2	7.8	8.2
12	Sample 3	7.4	7.1

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ANALYSIS REPORT

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Date : 09.02.2024

5. Visual Observation of Sample

Description	Week 1	Week 4	Week 9	Week 14	Week 17
Structure	Film sample	Film sample	Film sample	Film sample	Film sample
Moisture	Adequate Moisture level	Adequate Moisture level	Adequate Moisture level	Adequate Moisture level	Adequate Moisture level
Colour	Milky white	Milky white	Milky white	Faded white	---
Fungal Development	Nil	Nil	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like

6. Visual Observation of Compost

Description	Week 1	Week 4	Week 9	Week 14	Week 17
Structure	Fine Particles	Fine Particles	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture level	Adequate moisture level	Adequate moisture level	Adequate moisture level	Adequate moisture level
Colour	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
Fungal Development	Nil	Nil	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like

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Page 6 of 10

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TECHNOLOGY (IPT)

(Formerly Central Institute of Plastics Engineering & Technology)

Department of Chemicals & Petrochemicals

Ministry of Chemicals & Fertilizers, Govt. of India

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ANALYSIS REPORT

Report No.: 2279

Date : 09.02.2024

4. Result : Percentage biodegradation relative to positive reference

MEAN (%) : 93.18 %

The reference material- Cellulose (%) : 100%



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सह. तक. अधिकारी / Asst. Technical Officer

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किर्ती डी. त्रिवेदी / Kirti D. Trivedi

तक. अधिकारी / Technical Officer

सिपेट : पेट्रोकेमिकल्स तकनीकी
संस्थान (आई.पी.टी.)

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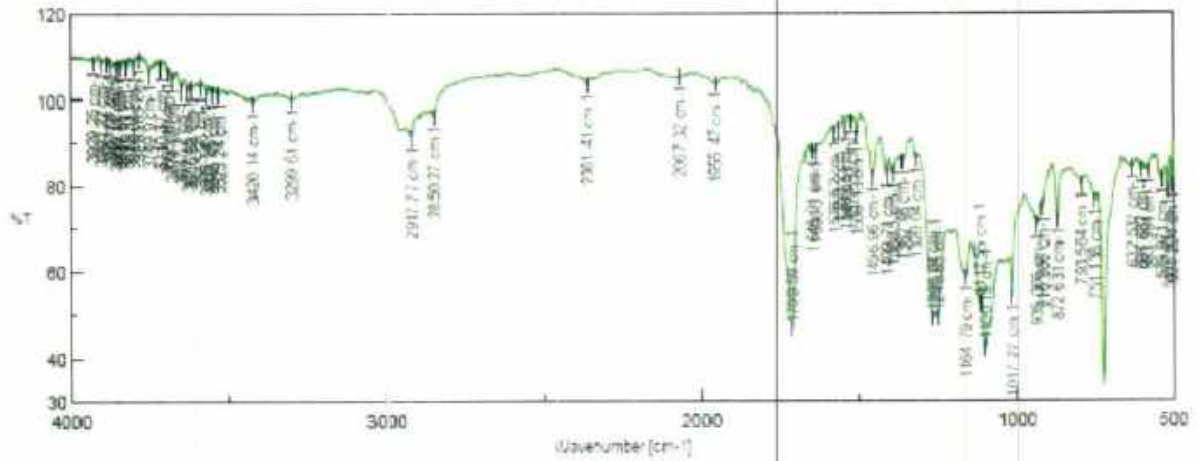
Report No.: 2279

Date : 09.02.2024

7. FTIR Analysis

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

BIC: 1365 jws



Wave number (cm ⁻¹)	Nature of Bond
1)2917.77	C - H Stretching vibrations
2)1709.59	C = O Stretching vibrations
3) 1249.84	O - H Bending vibrations
4) 1017.27	C - N Stretching vibrations
5) 872.631	C = C Bending vibrations

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तक. अधिकारी / **Technical Officer**

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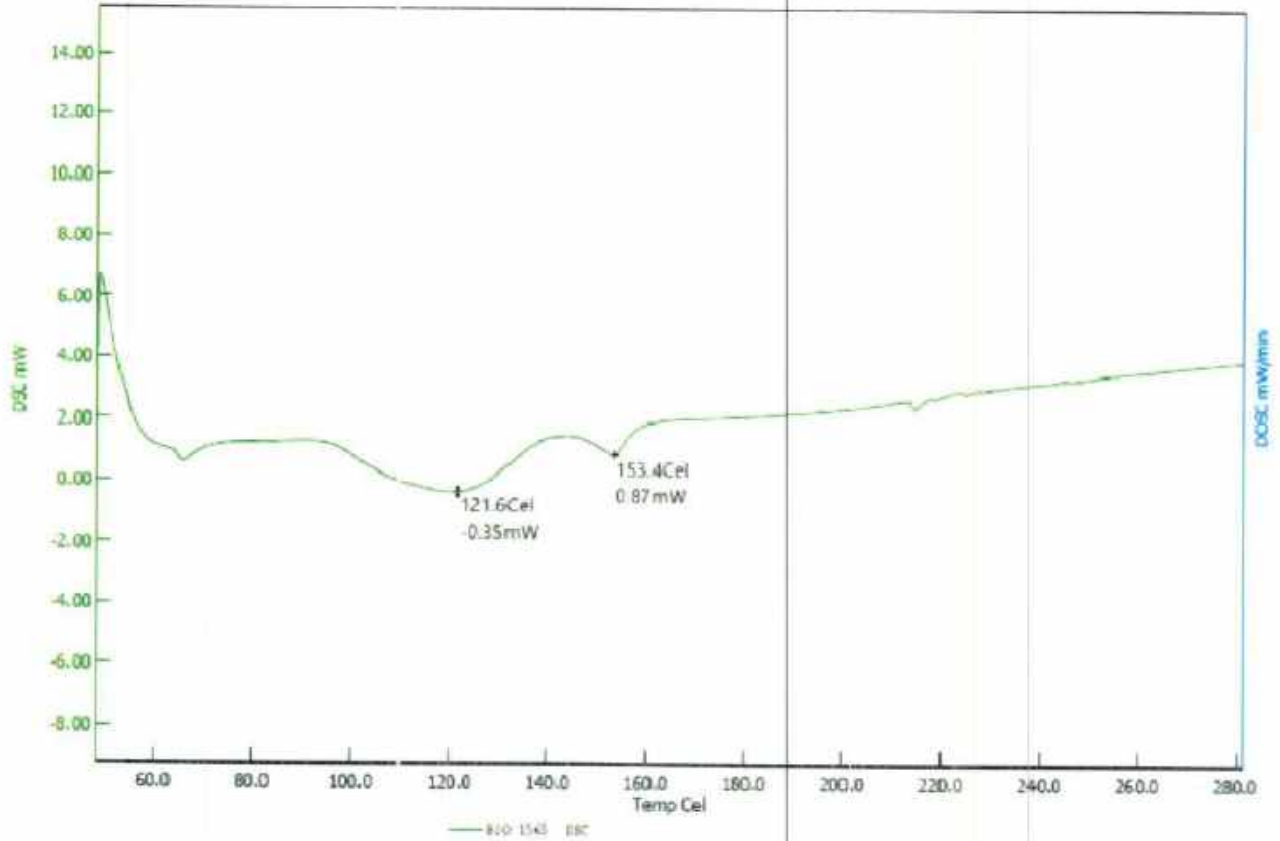
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Date : 09.02.2024

8. DSC Analysis



Comment: The above FTIR & DSC analysis indicates the above sample is Blends of PLA

(Polylactic Acid) / PBAT(Polybutylene Adipate co-terephthalate) **Compostable Film.**

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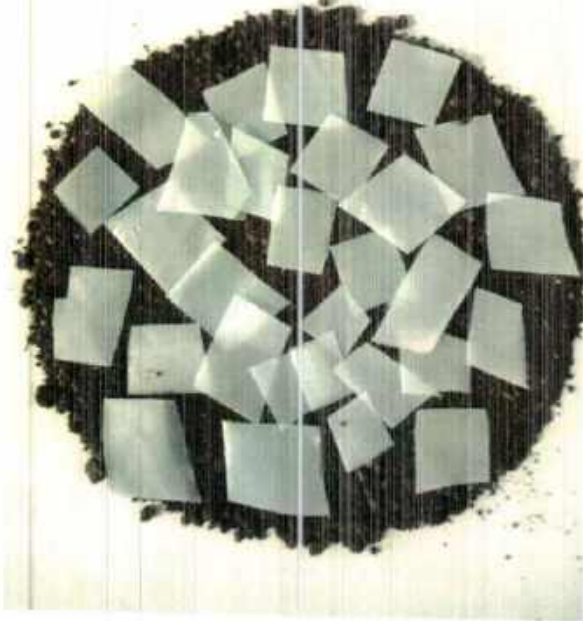
Report No.: 2279

Date : 09.02.2024

9. DISINTEGRATION - AFTER 12 WEEKS

CODE NO : 1565

Before Disintegration



BEFORE DISINTEGRATION

CODE NO : 1565

After Disintegration

(12 Weeks)



AFTER DISINTEGRATION

The disintegration of the sample by passing through 2 mm sieve after 12 week in composting condition as per ISO 17088-2021/ISO 17088: 2012 was found not more than 10% of original dry mass remain.

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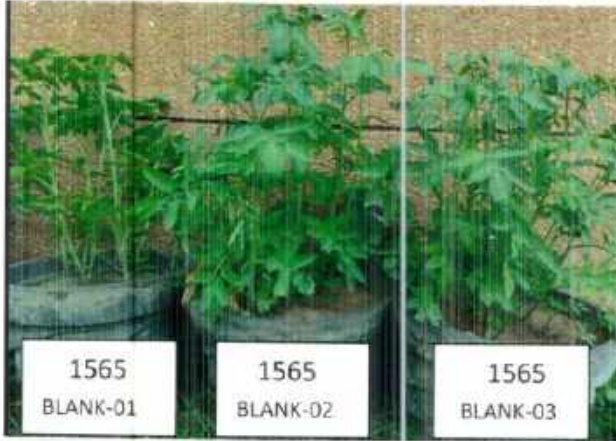
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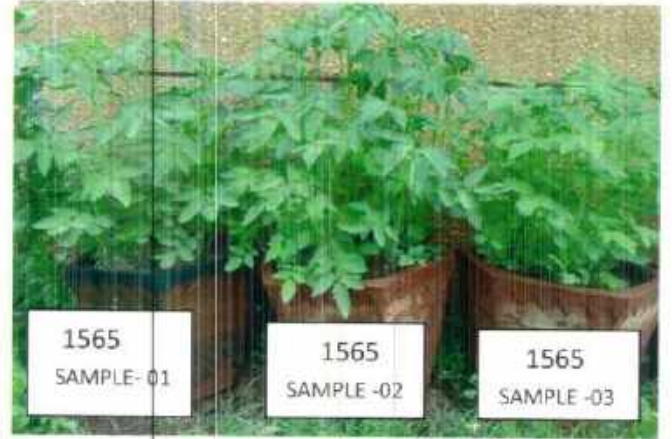
ANALYSIS REPORT

Report No.: 2279
Date : 09.02.2024

10. GERMINATION AND PLANT GROWTH STUDY



1565 Compost (Control)



1565 Compost (Sample)



1565 Compost (Control)



1565 Compost (Sample)

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

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तक. अधिकारी / Technical Officer

Declaration of Compliance

(As per Food Safety and Standards (Packaging) Regulations, 2018)

We, M/s Dhanush Eco Products, having our manufacturing unit at S. No. 138/4, Vemulavalsa, Anandapuram, Visakhapatnam – 531219, Andhra Pradesh, hereby declare that our Compostable Carry Bags and Films comply with the requirements of the Food Safety and Standards (Packaging) Regulations, 2018, and the relevant Indian Standards IS 9845:1998 and IS 17899 (Part 1):2022

1. Product Details

- Product Name: Compostable Carry Bags / Compostable Films
- Material Composition: PBAT-based compostable polymer blend with certified additives and fillers.
- Intended Use: Packaging and carry bags for direct or indirect contact with food items.
- Colour: Natural / Green-tinted

2. Test Details

- Testing Laboratory: Industrial Food Laboratory (IFL), Kochi – NABL Accredited
- Specific Migration Report No.: KH/25/77159/C66506 (ULR: TC633825000018630F)
- Overall Migration Report No.: KH/25/77158/C66505 (ULR: TC633825000018629F)
- Date of Issue: 29-10-2025
- Test Standard: IS 9845:1998

Overall Migration Results:

Distilled Water: 2.31 mg/dm² (Limit: ≤ 10 mg/dm²) - Pass
3% Acetic Acid: 4.52 mg/dm² (Limit: ≤ 10 mg/dm²) - Pass
n-Heptane: 0.35 mg/dm² (Limit: ≤ 10 mg/dm²) - Pass
Colour Migration: Nil - Pass

Specific Migration (Heavy Metals & Plasticizers):

Barium (Ba): 0.001 mg/kg (Limit 1.0) - Pass
Cobalt (Co): Not Detected (Limit 0.05) - Pass
Copper (Cu): 0.0073 mg/kg (Limit 5.0) - Pass
Iron (Fe): 0.0175 mg/kg (Limit 48.0) - Pass
Lithium (Li): Not Detected (Limit 0.6) - Pass
Manganese (Mn): 0.0100 mg/kg (Limit 0.6) - Pass
Zinc (Zn): 0.0460 mg/kg (Limit 25.0) - Pass
Antimony (Sb): Not Detected (Limit 0.04) - Pass
Phthalic acid, bis(2-ethylhexyl) ester (DEHP): < LOQ (0.1) (Limit 1.5) - Pass

All the above results are within the prescribed limits as per the Food Safety and Standards (Packaging) Regulations, 2018.

Declaration of Compliance

(As per Food Safety and Standards (Packaging) Regulations, 2018)

3. Declaration

We hereby confirm that:

1. The above product meets all migration safety requirements for food contact use.
2. No harmful or restricted substances were detected above permissible limits.
3. The same composition is maintained across all production batches.
4. The material is Compostable, certified by CPCB under valid license no. [Insert CPCB number].
5. We undertake to revalidate compliance if there is any change in formulation or raw material supplier.

For Dhanush Eco Products



Name: Narendra Kumar Vadlamudi

Designation: Manager

Date: 29-10-2025

Place: Visakhapatnam



ULR - TC633825000018629F

CERTIFICATE OF ANALYSIS | COPY
No. KH 152676 / 2025

CUSTOMER NAME & ADDRESS	DATE OF ISSUE : 29-10-2025
DHANUSH ECO PRODUCTS	SAMPLE RECEIPT : 14-10-2025
S. NO. 138/4	SAMPLE CODE : KH/25/77159/C66506
VEMULAVALSA	ANALYSIS STARTED : 14-10-2025
ANANDAPURAM, VISAKHAPATNAM-531219	ANALYSIS COMPLETED : 26-10-2025
Andhra Pradesh India	

INFORMATION PROVIDED BY CUSTOMER	
SAMPLE NAME	: COMPOSTABLE FILM

OTHER INFORMATION	
CONDITION OF SAMPLE	: RECEIVED IN GOOD CONDITION
SAMPLE SUBMITTED BY	: CUSTOMER

Sl. No.	SIMULANT USED	TEST CONDITION	UNIT OF MEASUREMENT	RESULTS	LIMIT OF QUANTIFICATION (LOQ)	TEST METHOD
1	OVERALL MIGRATION OF CONSTITUENTS					
	1) Distilled water	10 Days at 40° C	mg/dm ²	2.31	0.1	IS 9845 : 1998
	2) 3% Acetic acid in aqueous solution	10 Days at 40° C	mg/dm ²	4.52	0.1	IS 9845 : 1998
	3) n - Heptane	0.5 Hrs at 38° C	mg/dm ²	0.35	0.1	IS 9845 : 1998
	COLOUR MIGRATION	CONDITIONS SPECIFIED ABOVE	--	ABSENT	QUALITATIVE	IS 9845 : 1998

Remarks: As per Food Safety and Standards (Packaging) Regulations, 2018, overall migration limit for all packaging materials of plastic origin is 10 mg/dm² with no visible colour migration.



FOR AND ON BEHALF OF
INTERFIELD LABORATORIES
 N.S. KALESH, Ph.D.
 SECTION IN-CHARGE (CHEMISTRY)
 29-10-2025
 AUTHORIZED SIGNATORY

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ULR - TC633825000018630F

CERTIFICATE OF ANALYSIS | ORIGINAL
No. KH 152677 / 2025

CUSTOMER NAME & ADDRESS DHANUSH ECO PRODUCTS S. NO. 138/4 VEMULAVALSA ANANDAPURAM, VISAKHAPATNAM-531219 Andhra Pradesh India	DATE OF ISSUE : 29-10-2025 SAMPLE RECEIPT : 14-10-2025 SAMPLE CODE : KH/25/77159/C66506 ANALYSIS STARTED : 14-10-2025 ANALYSIS COMPLETED : 27-10-2025
--	---

INFORMATION PROVIDED BY CUSTOMER	
SAMPLE NAME	: COMPOSTABLE FILM
OTHER INFORMATION	
CONDITION OF SAMPLE	: RECEIVED IN GOOD CONDITION
SAMPLE SUBMITTED BY	: CUSTOMER

I. CHEMICAL TESTING : Plastic & Resins						
Sl. No.	PARAMETERS TESTED	REQUIREMENTS	UNIT OF MEASUREMENT	RESULTS	LIMIT OF QUANTIFICATION (LOQ)	TEST METHOD
1	SPECIFIC MIGRATION IN 3% ACETIC ACID IN WATER [CONTACT TIME: 10 DAYS AT 40°C]					
	1) Barium	1.0	mg/kg	0.0012	0.001	IFL C/QSP G/022
	2) Cobalt	0.05	mg/kg	Not Detected	0.001	IFL C/QSP G/022
	3) Copper	5.0	mg/kg	0.0073	0.001	IFL C/QSP G/022
	4) Iron	48.0	mg/kg	0.0175	0.001	IFL C/QSP G/022
	5) Lithium	0.6	mg/kg	Not Detected	0.001	IFL C/QSP G/022
	6) Manganese	0.6	mg/kg	0.0100	0.001	IFL C/QSP G/022
	7) Zinc	25.0	mg/kg	0.0460	0.001	IFL C/QSP G/022
	8) Antimony	0.04	mg/kg	Not Detected	0.001	IFL C/QSP G/022
2	SPECIFIC MIGRATION IN n-HEPTANE [CONTACT TIME: 0.5 Hrs at 38° C]					
	1) Phthalic acid, bis (2-ethyl hexyl) ester (DEHP)	Max. 1.5	mg/kg	< LOQ	0.1	IFL C/QSP G/022 & G/114

Remarks: The requirements mentioned above are the maximum migration limits of substances from plastic materials intended to be in contact with articles of food as per Food Safety and Standards (Packaging) Regulations, 2018, FSSAI



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