

Product Testing Laboratory

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उत्पाद परीक्षण प्रयोगशाला
यूनिट एकांग - सिपेट सी एस टी एस, मधुरै
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परिक्षण रिपोर्ट / TEST REPORT

CERTIFICATE OF ANALYSIS

AS PER ISO 17088:2021

CIPET/MDU/PTL/TR/2024-25/0637

Date- 27.05.2024

To,
M/s. Green Works Bio Products Pvt Ltd,
Plot No: 530, Bhagya Nagar Colony, Rampally (V),
Keesara (M), Medchal-Malkajgiri District.

Sub: Test Report- Reg.

Ref. No: 1) Test Request Dated 27.09.2023
2) Interim Test Report No. 09398 Dated 02.03.2024

Dear Sir,

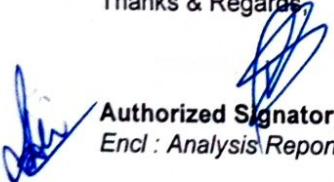
With reference to the above, the submitted sample was analyzed as per ISO 17088:2021. The summary detail of testing & analysis is given below:

Company Name & Address	: M/s. Green Works Bio Products Pvt Ltd, Plot No: 530, Bhagya Nagar Colony, Rampally (V), Keesara (M), Medchal-Malkajgiri District.
Test Standard	: ISO 17088:2021
Sample Details	: Bio-Compostable Bags
Test Report No	: 09398 (Final) & Dated : 02.03.2024
Date of Receipt of sample	: 28.10.2023
Date of Initiation	: 02.11.2023
Date of Completion	: 14.05.2024
Percentage of Compostability in 154 Days	: 90.88%
Requirement of Compostability in 180 days as ISO 17088:2021	: 90%

The sample submitted by M/s. Green Works Bio Products Pvt Ltd, Medchal-Malkajgiri District, Tamil Nadu, is compostable and the percentage of compostability in 154 days reported vide test report No.09398 is 90.088 %.

The submitted sample also complies with the terms of Compostability, Seed germination and Disintegration as per ISO 17088:2021

Thanks & Regards,


Authorized Signatory
Encl : Analysis Report



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Ref. No. : Test Request Dated: 27.09.2023
TEST REPORT : As per ISO 17088:2021
REPORT NO : 09398 (Final)

PART A: PARTICULARS OF SAMPLES SUBMITTED

a) Nature of Sample : Compostable Bags (As stated by Party)
b) Grade/Variety/Type/Size/Class etc : Compostable Bags (As stated by Party)
c) Brand name if any : Nil
d) Declared values if any : Nil
e) Code No. : Nil
f) Batch No. and date of Manufacture : Nil
g) Quantity : 3 kg
h) Mode of Packing : Packed
i) Date of receipt : 28.10.2023
j) Seal : Nil
k) I.O's signature on the sample : Nil
l) Test Duration : 02.11.2023 – 14.05.2024
m) Any other Information : Interim Report No.
CIPET/MDU/PTL/TR/2023-24/03918/TR. No. 09398
Dated: 02.03.2024

PART – B: SUPPLEMENTARY INFORMATIONS

a) Reference to sampling procedure : Supplied by the Party
b) Supporting documents for the : Nil
measurements taken and results derived
c) Deviation from the test methods as : Nil
Prescribed in relevant IS/Work
Instructions, if any



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PART-C TEST RESULTS

Sl. No.	Name of test	Test Method	Unit	Specified Requirements	Results Obtained
01	Material Identification	FTIR / DSC	--	--	Poly(butylene adipate-co-terephthalate) (PBAT)
02	Disintegration (Dry mass remains in 2mm sieve after 84 days)	ISO 20200:2015	%	Not more than 10	7.17
03	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	ISO 14855-1:2012	%	>90% (At the end of the test period not more than 180 days)	90.88 (at the end of 119 days)
04	Plant Growth study Monocotyledon % Seed emergence	OECD:208 Guidelines	%	>90.0	96.33
	Dicotyledon % Seed emergence		%	>90.0	94.66
05	Acute Ecotoxic Effects of Earthworm				
a)	Survival of adult earthworm at the end of 7 days	ISO 11268-2:2023	%	Shall be more than 90	96.67
b)	Survival of adult earthworm at the end of 14 days		%	Shall be more than 90	96.43
c)	Biomass end of the 14 days		%	Shall be more than 90	94.80
06	Chronic Eco toxic effects to earthworm				
a)	Survival of adult earthworm at the end of 28 days	ISO 11268-2:2023	%	Shall be more than 90	92.59
b)	Offspring at the end of 56 days		%	Shall be more than 90	92.93
c)	Biomass end of the 56 days		%	Shall be more than 90	94.86



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Sl. No.	Name of test	Test Method	Unit	Specified requirements	Results Obtained
07	Heavy Metal Analysis (On Dry Mass Basis)				
	Arsenic (As)	IS 3025:2022 (Part 37)	mg/kg	Max: 10.00	0.5515
	Copper (Cu)	IS 3025:1992 (Part 42)		Max: 300.00	2.5138
	Nickel (Ni)	IS 3025:2003 (Part 54)		Max: 50.00	0.2432
	Zinc (Zn)	IS 3025:1994 (Part 49)		Max: 1000.00	0.3303
	Chromium (Cr)	IS 3025:2003 (Part 52)		Max: 50.00	0.0730
	Mercury (Hg)	IS 3025:1994 (Part 48)		Max: 0.15	0.0300
	Cadmium (Cd)	IS 3025:2023 (Part 41)		Max: 5.00	0.0070
	Lead (Pb)	IS 3025:1994 (Part 47)		Max: 100.00	2.4395

PART-D: REMARKS:

Note: The detailed observation on biodegradation test is enclosed in Annexure -I

- NB:1. This Test Report / Certificates issued only for the samples submitted to CIPET.
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 Certificate shall not be reproduced except in full without the written approval of the laboratory.
5. Details of tests sub-contracted: Nil

End of Report

AUTHORISED SIGNATORY
Dr.Nalini R
Manager (T)

AUTHORISED SIGNATORY
Dr.K.Prakalathan
Director & Head