



CIPET : SCHOOL FOR ADVANCED RESEARCH IN
PETROCHEMICALS (SARP) - ARSTPS

रसायन एवं पेट्रोरसायन विभाग

रसायन एवं उर्वरक मंत्रालय, भारत सरकार

टी वी के इंडस्ट्रियल एन्स्टेट, गिण्ट्री, चेन्नई - 600 032

फ़ोन : ०३१-५५-२२२५४७७५

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INTERIM REPORT

CIPET/ARSTPS-IR/ACP/TR. No. 152

Date: 02.09.2021

Name & Address of the Party

1. M/s. Alpha Carbonless Paper Mfg. Co. Pvt. Ltd.

Plot No. C-101, TTC Industrial area.

Pawane, M.D.C.,

Navi Mumbai 400 705

Sample submitted on

: 26.04.2021

Date of initiation of aerobic biodegradation : 05/06/2021

: 05.08.2021

Date of completion of aerobic biodegradation: 28.08.2021

28.08.2021.

Sample details (as declared by the party) : Plastic Free Papers and Paper Boards

Sl. No.	Property	Test method / Standard	Unit	Results obtained	Specified Requirements
1.	Material Identification	FTIR / DSC	—	Paper sample one side coated with acrylic based aqueous dispersion coating	—
2	Disintegration (Dry mass remains in 2mm sieve after 84 days)	Cl. 6.2 of ISO 17088-2012 / IS 17088-2008	%	8.92	Not more than 10%
3.	Ultimate Aerobic Biodegradation (with reference to 100% degradation of positive reference)	Cl. 6.3 of ISO 17088-2012 / IS 17088-2008	%	92.7 (At the end of 84 days)	> 90% (At the end of the test period not more than 180 days)

Comments: The submitted sample of Plastic Free Papers and Paper Boards, (as stated by party) complies with the requirements of cl. 6.2 & 6.3 of ISO 17088-2012 / IS:17088-2008

Note:

1. The submitted sample is exposed under controlled compost condition as per ISO 14855-1 and at the end of 84 days, the cumulative biodegradation is estimated as 92.7% with reference to the degradation of the cellulose
2. The following tests are under progress as per the standard ISO 17088-2012 / IS 17088-2008
 - a. Heavy metal analysis as per Cl. no. 6.4.1.
 - b. Seed germination as per Cl. no. 6.4.4.
3. The final report will be issued after the completion of all the tests.
4. The interim report is only valid till the issue of test report.

Authorized Signator

E. Ravi

Authorized Signatory

Dr. K. R. Bhuvana

Page 1 of 1

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**सिपेट : पेट्रोकेमिकल्स उन्नत अनुसंधान
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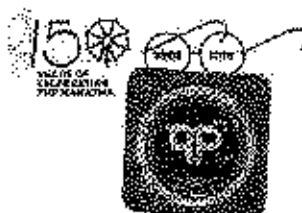
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TEST REPORT

Issued to: M/s. Alpha Carbonless Paper Mfg. Co., Pvt., Ltd., Plot No. C-101, TTC Industrial Area, Pawane, M.I.D.C., Navi Mumbai.		Test Report No. : PVT/152 Date : 29.10.2021 Ref. No. : Letter Date : 26.04.2021	
Test Report as per Standard: -			
PART A PARTICULARS OF SAMPLE SUBMITTED			
a)	Name of Sample (as stated by party)	:	1. Plastic free papers and Paperboards.
b)	Grade/Variety/Type/size/class	:	NA
c)	Declared value, if any	:	NA
d)	Code No.	:	NA
e)	Batch No. and Date of Manufacture	:	-
f)	Quantity	:	1 kg.
g)	Mode of packing	:	Packed in Postal Cover
h)	Date of Receipt	:	28.04.2021
i)	Date of Completion	:	29.10.2021
j)	Sealed or not	:	-
k)	Condition of Sample on Receipt	:	Received Sample in Good Condition
l)	Any other information (as stated by Party)	:	--
PART B SUPPLEMENTARY INFORMATION			
a)	Reference to sample procedure	:	Sampling not done by this lab
b)	Supporting documents for the measurement taken and result derived	:	NA
c)	Deviation from the test method as per prescribed in relevant work instructions, if any	:	--

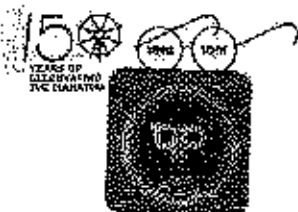
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Head office : CIPET, Guindy, Chennai - 600 032



Date: 29.10.2021

Plastic free Papers and Paperboards

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements
1	Material Identification	FTIR & DSC	-	Paper sample one side coated with acrylic based aqueous dispersion coating	-
2	Disintegration (Dry mass remains in 2 mm sieve after 84 days)	ASTM D 6868	%	8.92	No more than 10%
3	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	ASTM D 6868	%	92.7 (at the end of 84 days)	> 90 (at the end of the test period not more than 180 days.)
4.	Plant Growth study				
	Monocotyledon (Onion) % Seed emergence	ASTM D 6868	%	98	> 90
	Dicotyledon (Fenugreek) % Seed Emergence		%	92	> 90

The detailed observation on biodegradability test is enclosed as Annexure

AUTHORIZED SIGNATORY
Dr. K.P. BHUVANA

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Head office : CIPET, Guindy, Chennai - 600 032

Date: 29.10.2021

OBSERVATION FOR BIODEGRADABILITY TEST AS PER ASTM D 6868

M/s Alpha carbonless Paper Mfg. Co., Pvt., Ltd

Plot No. C - 101, TTC Industrial Area, Pawane, M.I.D.C., Navi Mumbai
400705

- | | | |
|---|--------------------------------------|--|
| 1 | Sample Details (As stated by Party): | Plastic free Papers and Paperboards. |
| 2 | Material Identification by FTIR : | Paper sample one side coated with acrylic-based aqueous dispersion coating |

BIODEGRADABILITY TEST AS PER ASTM D 5338

- #### (i) Conditions of reaction mixtures

Origin of Compost: Livestock excrement, municipal and vegetable waste

Reaction Temperature (°C) 58±2

Dry Solid (%)	54.2
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Volatiles content (%)	14.8
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CO₂ evolved during first 10 days in blank

vessels (mg/g of volatile content of compost)	81.4
---	------

Test duration (days)	84
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Reference material Cellulose

Volume of reaction vessel (mL)	3500
--------------------------------	------

- (iii) pH of test medium

S.No.	Compost Vessel	pH (Before)	pH (After)
1	Blank 1	7.6	7.6
2	Blank 2	7.8	7.7
3	Blank 3	7.5	7.4
4	Cellulose 1	7.8	7.6
5	Cellulose 2	7.9	7.8
6	Cellulose 3	7.6	7.4
7	Negative 1	7.8	7.6
8	Negative 2	7.9	7.7
9	Negative 3	7.9	7.5
10	Sample 1	7.6	7.4
11	Sample 2	7.9	7.6
12	Sample 3	7.6	7.8

B. RAV1

Dr. K.P. BHUVANA

पंजीत : अहमदाबाद, अमृतसर और जामनागर आगराकर : पदी, मालवीय, मैथिली, मराठी, भुवनेश्वर चन्द्रपुर, चन्द्र, देशमुख, पुष्पाभा, गुवाहाटी, व्यासिन,
देवरघाव, शाहीपुर हजिया इफ्ताल जखनर जलिन, तैवेरवा, लखनऊ, थरूर, भुवनेश्वर मैसूर राजेश्वर राँको, वल्लभ एव निजगमक

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Phone : +91-44-2225-4794

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Date: 29.10.2021

Figure 1 is a line graph titled "TR No. 152" showing the biodegradation percentage of two materials over a 100-day incubation period. The y-axis is labeled "Biodegradation (%)" and ranges from 0 to 120 in increments of 20. The x-axis is labeled "Incubation Time (Days)" and ranges from 0 to 100 in increments of 20. The legend indicates two data series: "Cellulose" represented by a solid line with square markers, and "Plastic Free Papers and Paperboards" represented by a dashed line with circle markers. Both series start at 0% biodegradation at day 0. The Cellulose series shows a rapid increase, reaching approximately 90% by day 70 and plateauing. The Plastic Free Papers and Paperboards series shows a slower increase, reaching approximately 85% by day 70 and plateauing.

Incubation Time (Days)	Cellulose Biodegradation (%)	Plastic Free Papers and Paperboards Biodegradation (%)
0	0	0
10	0	0
20	10	5
30	25	15
40	55	35
50	75	60
60	85	75
70	90	85
80	90	85
90	90	85
100	90	85

Description	Week 2	Week 3	Week 5
Structure	Cut pieces paper board sample	Fragmented pieces	Fragmented pieces
Moisture	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level
Colour	White	Dirty white	-
Fungal Development	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 8	Week 10	Week 12
Structure	-	-	-
Moisture	Appropriate moisture Level	Appropriate moisture Level	Appropriate moisture Level
Colour	-	-	-
Fungal Development	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

AUTHORIZED SIGNATORY
Dr. K. P. BHUVANA

केंद्र : अहमदाबाद, अमृतसर, औरंगाबाद, अगस्तवा, बर्डी, बालासोर, बेरहल, बीकानेर, भुवनेश्वर, बंगलूर, बरनई, चेन्नई, दिसावादा, गुजरात, गुवाहाटी, श्रवस्तिपुर, हैदराबाद, झांसीपुर, इस्लिया, इन्साल, जयपुर, कोल्हा, कोरवा, लखनऊ, मडुरी, मुंबई, मैसूर, रायपुर, रीडी, बल्लारवा एवं विजयवाड

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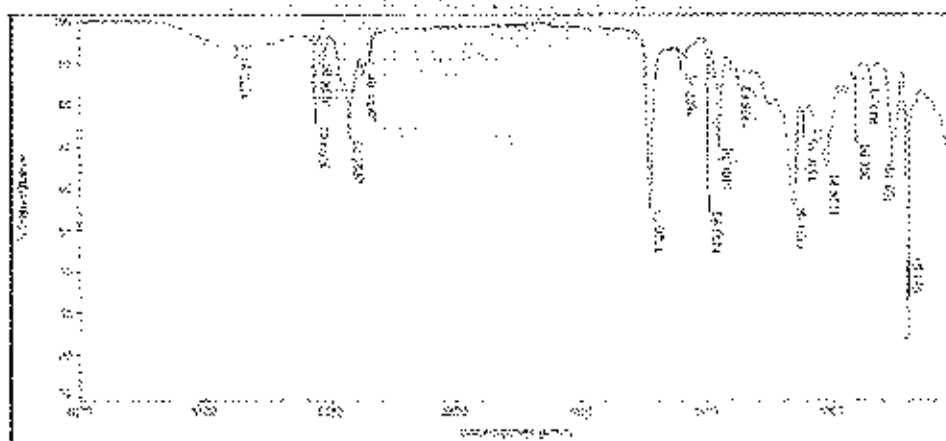


Date: 29.10.2021

Description	Week 2	Week 3	Week 5
Structure	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark Brown	Dark Brown	Dark Brown
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 8	Week 10	Week 12
Structure	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark Brown	Dark Brown	Dark Brown
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Plastic free Papers and Paperboards



FTIR Spectrum of Coating

AUTHORIZED SIGNATORY
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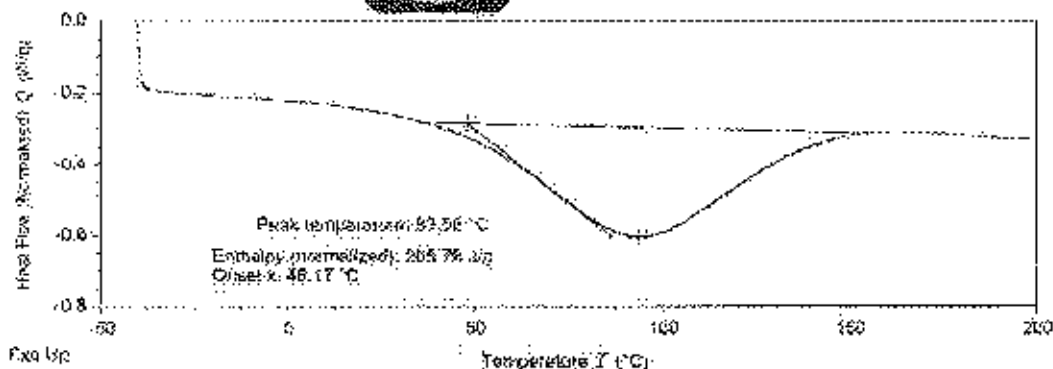
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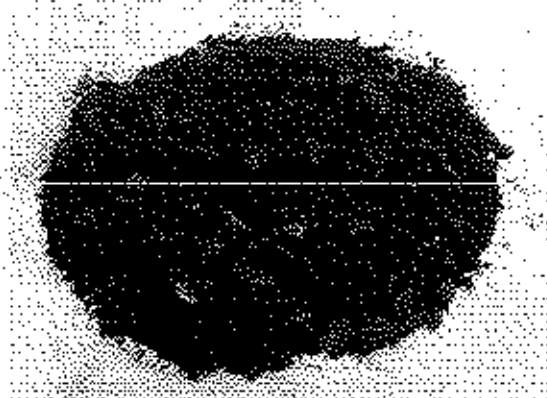


Comment: The above DSC & FTIR analysis indicates the submitted sample is a Paper sample one side coated with acrylic based aqueous dispersion coating

9 Disintegration After 12 Weeks



Before Disintegration



After Disintegration

The disintegration of the supplied sample by passing through 2 mm sieve after 12 week in composting condition as per ASTM D 6868 was found not more than 10% of original dry mass remaining.

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Dr. K.P. BHUVANA

[illegible]

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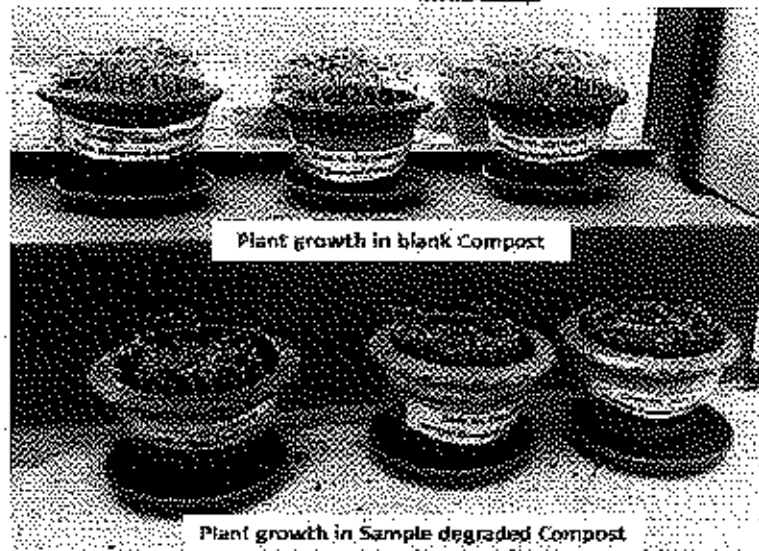
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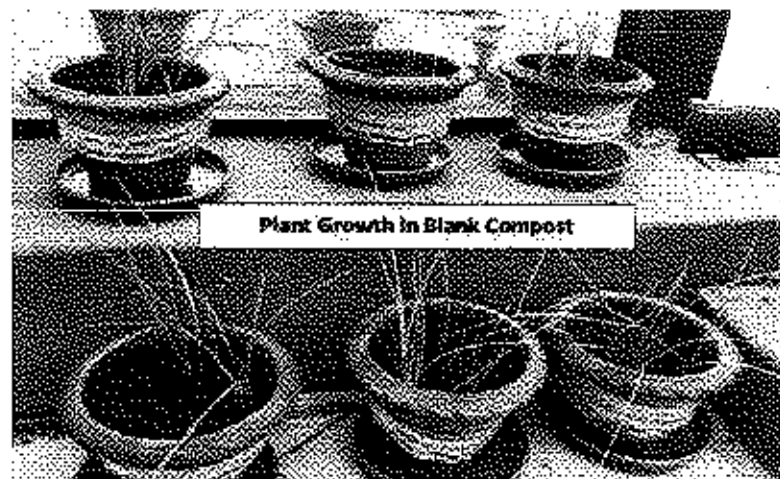
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Date: 29.10.2021

10 Seed Germination & Plant growth study



Fenugreek - Dicotyledon



Onion - Monocotyledon

The percentage of seed germination rate is found to be greater than 90% for both Monocotyledon & Dicotyledon with reference to the blank compost

AUTHORIZED SIGNATORY
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Dr. K.R. BHUVANA

केन्द्र : अहमदाबाद, अमृतसर, औरंगाबाद, अंगरवाला, बर्ही, बालासोर, बंगलुरु, भोपाल, भुवनेश्वर, चण्डीपुर, चेन्नई, देहरादून, धुलियान, गुवाहाटी, गुवागिर, हदराबाद, हाजीपुर, हरदोवा, इलाहाबाद, जयपुर, कोल्लि, कोरबा, कलकत्ता, लखनऊ, लहौर, मुम्बई, नैनीताल, रायपुर, राँची, बलराज एवं विजयवाड़ा
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2010-2011

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Head office : CIPET, Guindy, Chennai - 600 032

Date: 29.10.2021

Sample details:

Plastic free Papers and Paperboards

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements*
5	Heavy metals concentration				
a.	Arsenic (As)			BDL (DL: 0.006)	20
b.	Copper (Cu)			0.161	500
c.	Nickel (Ni)			0.011	100
d.	Zinc (Zn)			0.002	2500
e.	Cobalt (Co)	ASTM D 6868	mg/L	BDL (DL: 0.004)	-
f.	Chromium (Cr)			0.077	300
g.	Molybdenum (Mo)			0.535	-
h.	Mercury (Hg)			0.01	10
i.	Cadmium (Cd)			0.003	20
j.	Lead (Pb)			0.09	500
k.	Selenium (Se)			0.016	-

Note: BDL - Below Detection Limit, DL - Detection Limit

* 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.

AUTHORIZED SIGNATORY
B. RAVI

AUTHORIZED SIGNATORY
Dr. K.P. BHUVANA

[illegible]

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