

सिपेट : इंस्टिट्यूट ऑफ प्लास्टिक्स टेक्नोलॉजी
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CIPET सिपेट
probe - perform - practice - Plastics

परीक्षण रिपोर्ट TEST REPORT

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क्र.सं / SI. No. 22864

रिपोर्ट सं / REPORT NO. 59302

Pages... 3Nos. Part A,B,C & D

दिनांक / Date :

15.11.2019

संदर्भ / Ref. Lr. Dated: Nil

परीक्षण मानक स्तर के अनुसार परीक्षण रिपोर्ट / TEST REPORT AS PER TEST STANDARD : Refer Part C

भाग - क / PART - A

प्रस्तुत सैपिल का विवरण / PARTICULARS OF SAMPLE SUBMITTED

अ) सैपिल का नाम / a) Name of the Sample	: Film Roll Sample -as stated by the party
आ) सैपिल प्राप्त होने की तारीख / b) Date of Receipt of sample	: 02.01.2019
इ) ग्रेड/प्रकार/आकार/वर्ग / c) Grade / variety / type / size / class	: Not applicable
ई) घोषित मूल्य / d) Declared value, If any	: Not applicable
उ) कोड सं. / e) Code No.	: Not applicable
ऊ) बैच सं. एवं निर्माण तारीख / f) Batch No. and Date of Manufacture:	: Not applicable
ऋ) मात्रा / g) Quantity	: 01 Roll
ए) पैकिंग की रीति / h) Mode of Packing	: Packed in Carton Pack
ऐ) मोहर बंद या नहीं / i) Sealed or not	: Not Sealed
ओ) कोई अन्य सूचना / j) Any other information	: --

भाग - ख / PART - B

अनुपूरक सूचनाएँ / SUPPLEMENTARY INFORMATIONS

अ) सैपिलिंग कार्यवाहियों हेतु संदर्भ / a) Reference to sampling procedure	: Sampling not done by this lab
आ) माप करने हेतु लिए गए सहायक दस्तावेज एवं प्राप्त परिणाम b) Supporting documents for the measurement taken and result derived	: As given in Part C
इ) संबंधित कार्य अनुदेशों में निर्धारित के अनुसार परीक्षण रीति से कोई परिवर्तन c) Deviation from the test method as prescribed in relevant work instructions, if any	: No deviation from the standard

रिपोर्ट सं / REPORT NO. : 59302

दिनांक / Date : 15.11.2019



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भाग - ग / PART - C

परीक्षण परिणाम / TEST RESULTS

Test Duration: 02.01.2019 to 15.11.2019

Sl. No.	Property	Standard	Unit	Results obtained	Specified Requirements
1.	Material Identification by FTIR	--	--	Blend of Poly Lactic Acid (PLA) and Poly Butylene Adipate co-terephthalate (PBAT)	--
2.	Disintegration (Dry mass passing through 2mm sieve after 84 days)	ISO-17088 / IS-17088	%	92.7	Greater than 90
3.	Ultimate Aerobic Biodegradation (with reference to 100% degradation of positive reference)	ISO-17088 / IS-17088	%	90.11 (At the end of 90 days)	Greater than 90
4.	Plant Growth study a) Rice % Seed emergence	ISO-17088 / IS-17088	%	91	Greater than 90
	b) Tomato % Seed Emergence		%	92	Greater than 90

(Contd...)

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Report No: **59302**

TEST RESULTS

Date: **15.11.2019**

Sl. No.	Property	Standard	Unit	Results obtained	Specified Requirements (In India Maximum)*
5.	Heavy metals concentration	ISO-17088 / IS-17088	ppm		
	Arsenic (As)			0.013	20
	Copper (Cu)			1.657	500
	Nickel (Ni)			0.942	100
	Zinc (Zn)			4.320	2500
	Cobalt (Co)			0.374	--
	Chromium (Cr)			1.142	300
	Molybdenum (Mo)			0.079	--
	Mercury (Hg)			BDL (DL: 0.0005)	10
	Cadmium (Cd)			BDL (DL: 0.001)	20
	Lead (Pb)			0.498	500
	Selenium (Se)			0.018	--

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. The results related only to the items tested as supplied by the party.
2. The test certificate shall not be reproduced in full except without the written approval of the laboratory.

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K. Prabhakaran
AUTHORISED SIGNATORY



BIODEGRADABILITY TEST AS PER IS/ISO 17088

1. **Sample detail:** Film roll Sample (as declared by the party)
2. **Material Identification by FTIR:** Blend of Poly Lactic Acid (PLA) & Poly Butylene Adipate Terephthalate (PBAT)
3. **Observation**

(1) Conditions of reaction mixtures

Origin of compost: Livestock excrement, municipal and vegetable waste
Reaction Temperature : 58°C ($\pm 2^\circ\text{C}$)
Dry Solid (%) : 51.0
Volatile content (%) : 33.8
CO₂ evolved during first 10days in blank vessels: 54.10 mg/g of volatile content of compost
Test duration (day) : 90 days
Reference material : Cellulose
Volume of reaction vessel : 3000 ml

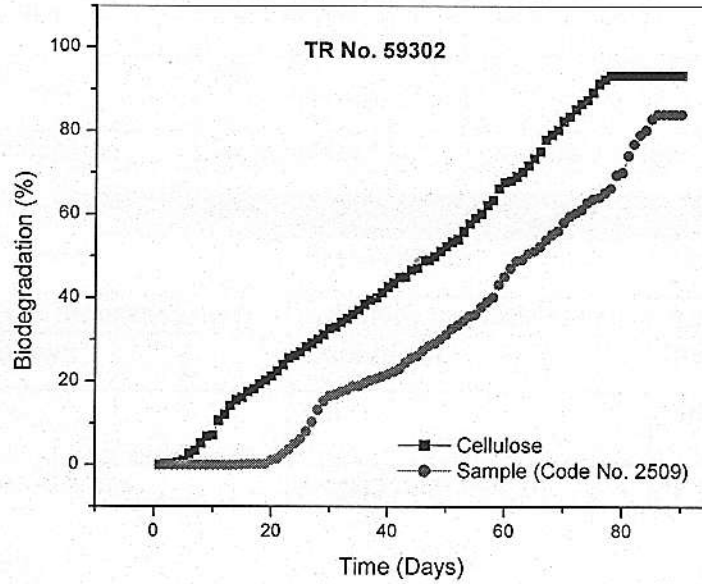
(2) pH of test medium

S. No.	Composting Vessel (Material with test medium)	pH (before)	pH (after)
1	Sample 1	7.5	7.2
2	Sample 2	7.5	7.2
3	Sample 3	7.5	7.3
4	Blank	7.5	7.5
5	Cellulose 1	7.5	7.2
6	Cellulose 2	7.5	7.2
7	Cellulose 3	7.5	7.3
8	Negative	7.5	7.5

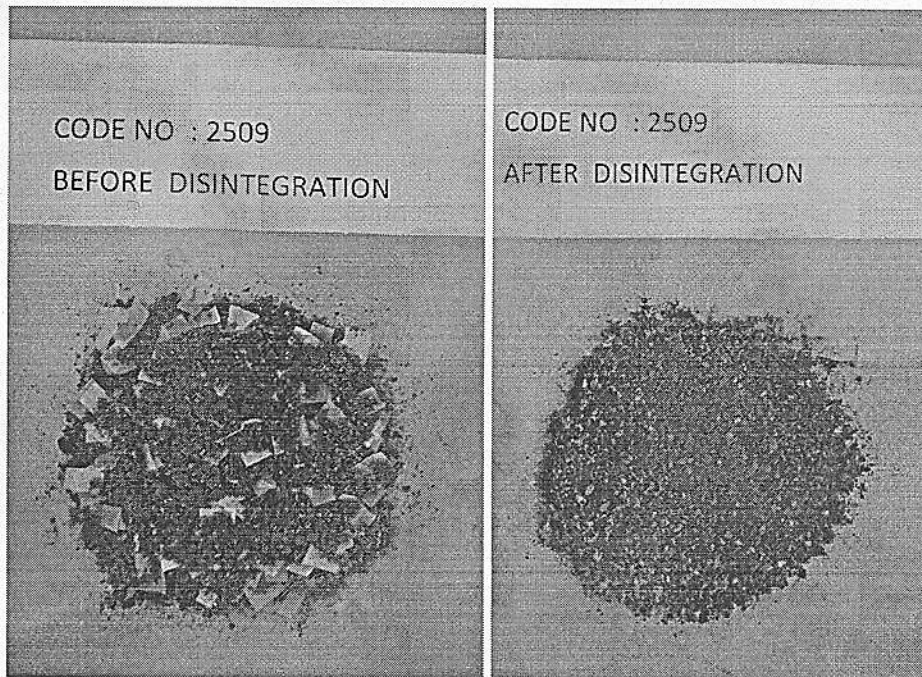




4. Result: Percentage biodegradation relative to positive reference
Sample (Mean of 3 replicates) : 90.11%
Positive reference cellulose (Mean of 3 replicates) : ~ 100 %



5. Disintegration- After 12 weeks



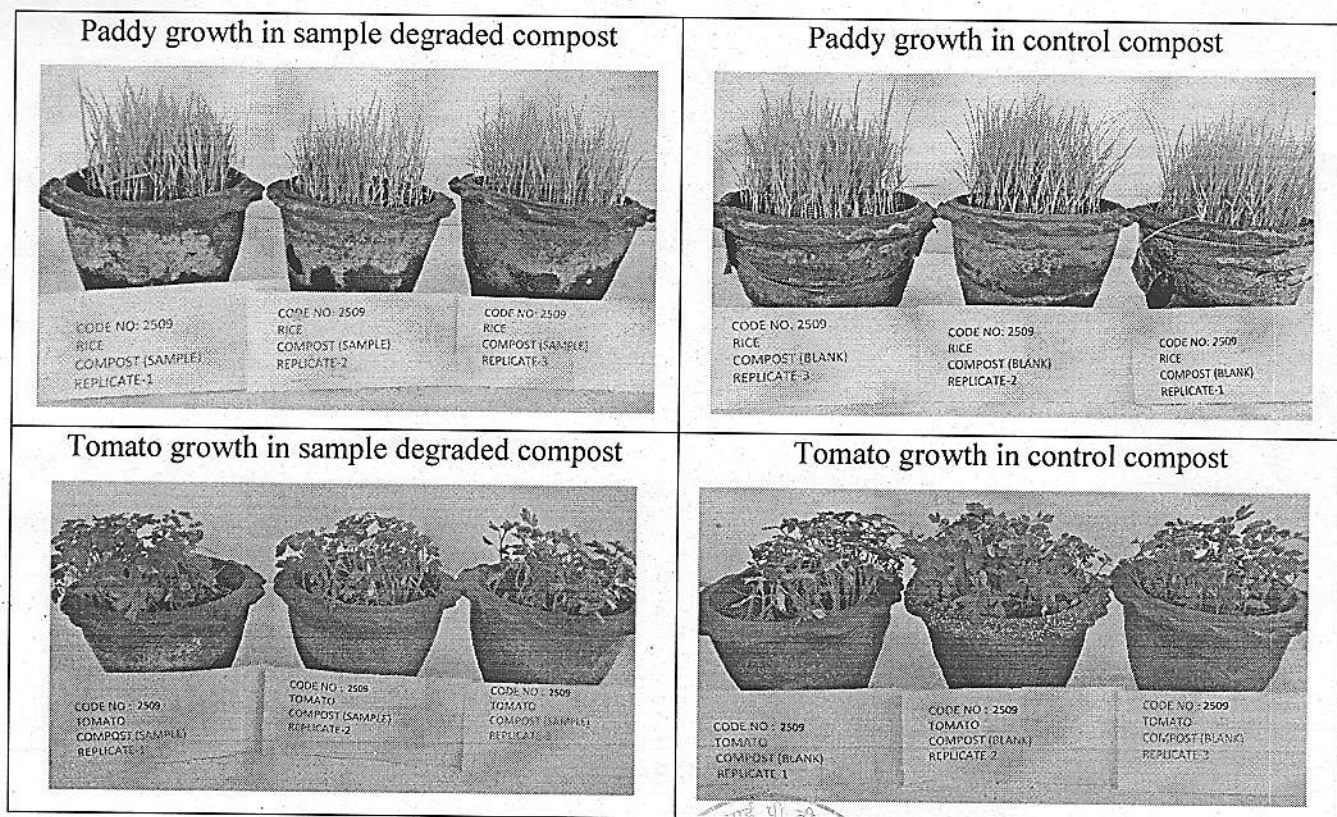


6. Visual Observation

Description	Week 1/2	Week 3/4	Week 5	Week 6/7
Structure	Fine Particles	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark brown	Dark brown	Dark brown	Dark brown
Fungal Development	Nil	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 8/9	Week 10/11	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

7. Plant Growth Study



K. Srinivas
Authorized Signatory
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