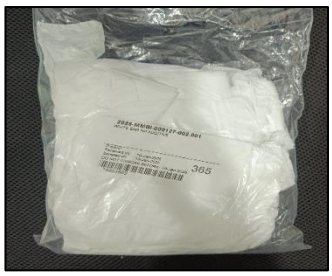
TEST REPORT

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000127/2025	**Sample No:** 18903861 - 62	**Report Date:** 27/06/2025

Sample Registration Date	10/01/2025	
Analysis Starting Date	10/01/2025	
Analysis Completed on	In process	
Sampling Done by	Sample drawn and supplied by customer	
Deviation from the test methods:	None	
Packaging Condition/sealed/unsealed	Sealed with box	
Sample Image	**Figure 1: PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010**	 **Figure 2: WHITE BAG NO ADDITIVE Sample**

DETAILS PROVIDED BY THE CUSTOMER

Customer Name:	BYCSA S.A.
Contact Person:	Mr. Carolina Perez Quiros
Address:	CALLE 20 SUR # 25B 91 INT 130 0500001 MEDELLIN, COLOMBIA
Sample submitted as	1) PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010/ (Aditivo Acelerador ECOBYC ECP-010), Group sample for NEXU GROUP-BYCSA COSTUMERS-CAMARA AMBIENTAL DEL PLASTICO AFILIATES-BIOSUSTAINABLE 2) WHITE BAG NO ADDITIVE
Description on label/Sample Bottle	PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010 and WHITE BAG NO ADDITIVE
Sample type	PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010 and WHITE BAG NO ADDITIVE
Quantity	1 Packet
Mode of Packaging	Courier Box
Sample condition	Sample was at ambient temperature in good condition
Test Method	ASTM D5338: Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures
Procedure number	NA

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000127/2025	**Sample No:** 18903861 - 62	**Report Date:** 27/06/2025

LABORATORY

Testing as presented in this report was conducted by Environmental division of Intertek India Private Limited. The testing facility is located at F wing, 2nd Floor, Chandivali Saki vihar Road, Andheri (East), Mumbai – 400 072, India.

SAMPLE RECEIPT

The PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010/ (Aditivo Acelerador ECOBYC ECP-010), Group sample for NEXU GROUP-BYCSA COSTUMERS-CAMARA AMBIENTAL DEL PLASTICO AFILIATES-BIOSUSTAINABLE and WHITE BAG NO ADDITIVE Samples Sample was received on 10/01/2025 at the Intertek testing facility. The sample was sent through courier. The sample was at ambient temperature in good condition with no evidence of damage or contamination. No temperature preservation was required.

PROJECT DESCRIPTION:

PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010 and WHITE BAG NO ADDITIVE samples were submitted by BYCSA S.A. for testing under standard ASTM D5338. This method determines the degree and rate of aerobic biodegradation of plastic materials on exposure to a controlled composting environment under laboratory conditions, at thermophilic temperatures. The samples were exposed to an inoculum that is derived from compost from municipal solid waste. The aerobic composting takes place in an environment where temperature, aeration and humidity are closely monitored and controlled. The percentage of biodegradability is obtained by determining the percentage of carbon in the test sample that is converted into CO_2 during the duration of the test.

Apparatus Setup:

A series of 09 composting vessels of 5-liter volume (1 blank i.e. compost, 1 positive i.e. cellulose mixed with compost, and 1 test plastic sample mixed with compost, all in 3 replicates). The entire composting vessel were kept in Incubator capable of maintaining the temperature of composting vessels at 58 ± 2°C (Figure 2). Pressurized air system that provides CO_2 free, H_2O saturated air to each of the composting vessels at accurate aeration rate. CO_2 evolved will be absorbed by 0.024 N Ba $(OH)_2$ and the amount of CO_2 will be determined by titrating with 0.05 N HCl.

Compost Inoculum:

The compost inoculum should be 2 to 4 months old, well aerated compost from organic fraction of municipal solid waste, sieved on a screen of less than 10 mm, compost from plants, treating green or yard waste or mixtures of municipal solid waste and green waste should be used. The compost inoculum should produce 50-150 mg of CO_2 per gram of volatile solids over the first 10 days of the test and an ash content of less than 70% and a pH between 7 and 8.2, is desired. The amount of total dry solids may range from 50 to 55%. Compost should have sufficient porosity to enable aerobic conditions. The compost inoculum should be as free from larger inert materials (glass, stones, metals, etc.) as possible.

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000127/2025	**Sample No:** 18903861 - 62	**Report Date:** 27/06/2025

Figure 2: compost inoculum

PROCEDURE:

The composting vessels will be incubated in diffuse light minimum for a period of 45 days, or more & the temperature of the system will be maintained at 58°C. The CO_2 & O_2 concentrations will be checked in the outgoing air. The air flow will be adjusted to maintain a CO_2 concentration of at least 2% vol /vol to allow accurate determination of CO_2 level in the exhaust air. Composting vessels will be shaken weekly to prevent extensive channeling, provide uniform attack on test specimen and provide an even distribution of moisture.

Carbon Dioxide Analysis:

The carbon dioxide (CO_2) produced in each vessel reacted with $Ba(OH)_2$ and will be precipitated as barium carbonate ($BaCO_3$).The amount of carbon dioxide produced will be determined by titrating the remaining barium hydroxide with 0.05N hydrochloric acid to a phenolphthalein end point. Data obtained from the titration will be used to calculate the amount of CO_2 produced.

RESULTS:

The PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010 and WHITE BAG NO ADDITIVE Samples were subjected to biodegradation as per ASTM D5388 biodegradability test under controlled composting conditions at 58°C ± 2°C and biodegradability was determined by measuring the actual metabolic conversion of the compostable material into carbon dioxide using the standard test method. After 90 days of incubation under dry (58 °C ± 2°C), aerobic controlled composting conditions using test method ASTM D5338, the reference (Positive control) and sample were gradually biodegraded. The reference sample degraded around 98.67 % after 90 days and The PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010 and WHITE BAG NO ADDITIVE Sample showed 12.69 % and 0.75 % respectively after 90 days.

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

TEST REPORT

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000127/2025	**Sample No:** 18903861 - 62	**Report Date:** 27/06/2025

Table 1: Percentage Biodegradation of Positive control and Test samples

Day	Percentage Biodegradation		
	Positive Control	PE PLASTIC BAG 99% PE 1% Biosustainable/NEXU ECP-010	WHITE BAG NO ADDITIVE
0	0.00	0.00	0.00
3	5.24	0.67	0.00
6	9.25	1.21	0.08
10	18.25	2.67	0.13
14	23.45	3.88	0.18
18	29.83	4.11	0.22
21	36.50	4.89	0.28
24	42.67	5.29	0.29
27	52.80	5.89	0.32
30	60.53	6.27	0.38
35	68.92	6.82	0.42
40	71.53	7.12	0.49
45	76.88	7.40	0.55
52	80.82	8.20	0.60
60	84.82	8.62	0.64
67	87.46	9.29	0.66
72	90.62	10.27	0.69
80	94.45	11.46	0.71
90	98.67	12.69	0.75

Reviewed By

Alok Pandey
Assistant Manager - Biodegradability Services

Authorized Signatory

Ushadevi Yadav
Deputy Manager - Biodegradability Services

---------- **End of Report** ----------

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

TEST REPORT

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000128/2025	**Sample No:** 18903882 - 83	**Report Date:** 27/06/2025

Sample Registration Date	10/01/2025	
Analysis Starting Date	10/01/2025	
Analysis Completed on	In process	
Sampling Done by	Sample drawn and supplied by customer	
Deviation from the test methods:	None	
Packaging Condition/sealed/unsealed	Sealed with box	
Sample Image	**Figure 1: PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010**	**Figure 2: PP STRAW NO ADDITIVE Samples**

DETAILS PROVIDED BY THE CUSTOMER

Customer Name:	BYCSA S.A.
Contact Person:	Mr. Carolina Perez Quiros
Address:	CALLE 20 SUR # 25B 91 INT 130
	0500001 MEDELLIN, COLOMBIA
Sample submitted as	1) PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010(Aditivo Acelerador ECOBYC ECP-010) Group sample for BYCSA-BYCSA COSTUMERS- CAMARA AMBIENTAL DEL PLASTICO AFILIATES-BIOSUSTAINABLE 2) PP STRAW NO ADDITIVE Samples
Description on label/Sample Bottle	PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010 and PP STRAW NO ADDITIVE
Sample type	PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010 and PP STRAW NO ADDITIVE
Quantity	1 Packet
Mode of Packaging	Courier Box
Sample condition	Sample was at ambient temperature in good condition
Test Method	ASTM D5338: Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures
Procedure number	NA

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000128/2025	**Sample No:** 18903882 - 83	**Report Date:** 27/06/2025

LABORATORY

Testing as presented in this report was conducted by Environmental division of Intertek India Private Limited. The testing facility is located at F wing, 2nd Floor, Chandivali Saki vihar Road, Andheri (East), Mumbai – 400 072, India.

SAMPLE RECEIPT

PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010 (Aditivo Acelerador ECOBYC ECP-010) Group sample for BYCSA-BYCSA COSTUMERS- CAMARA AMBIENTAL DEL PLASTICO AFILIATES-BIOSUSTAINABLE and and PP STRAW NO ADDITIVE samples was received on 10/01/2025 at the Intertek testing facility. The sample was sent through courier. The sample was at ambient temperature in good condition with no evidence of damage or contamination. No temperature preservation was required.

PROJECT DESCRIPTION:

PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010 and PP STRAW NO ADDITIVE samples were submitted by BYCSA S.A. for testing under standard ASTM D5338. This method determines the degree and rate of aerobic biodegradation of plastic materials on exposure to a controlled composting environment under laboratory conditions, at thermophilic temperatures. The samples were exposed to an inoculum that is derived from compost from municipal solid waste. The aerobic composting takes place in an environment where temperature, aeration and humidity are closely monitored and controlled. The percentage of biodegradability is obtained by determining the percentage of carbon in the test sample that is converted into CO_2 during the duration of the test.

Apparatus Setup:

A series of 09 composting vessels of 5-liter volume (1 blank i.e. compost, 1 positive i.e. cellulose mixed with compost, and 1 test plastic sample mixed with compost, all in 3 replicates). The entire composting vessel were kept in Incubator capable of maintaining the temperature of composting vessels at 58 ± 2°C (Figure 2). Pressurized air system that provides CO_2 free, H_2O saturated air to each of the composting vessels at accurate aeration rate. CO_2 evolved will be absorbed by 0.024 N Ba $(OH)_2$ and the amount of CO_2 will be determined by titrating with 0.05 N HCl.

Compost Inoculum:

The compost inoculum should be 2 to 4 months old, well aerated compost from organic fraction of municipal solid waste, sieved on a screen of less than 10 mm, compost from plants, treating green or yard waste or mixtures of municipal solid waste and green waste should be used. The compost inoculum should produce 50-150 mg of CO_2 per gram of volatile solids over the first 10 days of the test and an ash content of less than 70% and a pH between 7 and 8.2, is desired. The amount of total dry solids may range from 50 to 55%. Compost should have sufficient porosity to enable aerobic conditions. The compost inoculum should be as free from larger inert materials (glass, stones, metals, etc.) as possible.

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000128/2025	**Sample No:** 18903882 - 83	**Report Date:** 27/06/2025

Figure 3: compost inoculum

PROCEDURE:

The composting vessels will be incubated in diffuse light minimum for a period of 45 days, or more & the temperature of the system will be maintained at 58°C. The CO_2 & O_2 concentrations will be checked in the outgoing air. The air flow will be adjusted to maintain a CO_2 concentration of at least 2% vol /vol to allow accurate determination of CO_2 level in the exhaust air. Composting vessels will be shaken weekly to prevent extensive channeling, provide uniform attack on test specimen and provide an even distribution of moisture.

Carbon Dioxide Analysis:

The carbon dioxide (CO_2) produced in each vessel reacts with $Ba(OH)_2$ and will be precipitated as barium carbonate ($BaCO_3$).The amount of carbon dioxide produced will be determined by titrating the remaining barium hydroxide with 0.05N hydrochloric acid to a phenolphthalein end point. Data obtained from the titration will be used to calculate the amount of CO_2 produced.

RESULTS:

The PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010 and PP STRAW NO ADDITIVE Samples were subjected to biodegradation as per ASTM D5388 biodegradability test under controlled composting conditions at 58°C ± 2°C and biodegradability was determined by measuring the actual metabolic conversion of the compostable material into carbon dioxide using the standard test method. After 90 days of incubation under dry (58 °C ± 2°C), aerobic controlled composting conditions using test method ASTM D5338, the reference (Positive control) and sample were gradually biodegraded. The

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has been not drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request

Intertek India Private Limited
"F" wing Tex Centre,
26-A, Chandivali Farm Road,
Off. Saki Vihar Road, Andheri (East)
Mumbai – 400 072, India.
Tel : +91 22 42450100
www.intertek.com

Report No.: MUM/000128/2025	**Sample No:** 18903882 - 83	**Report Date:** 27/06/2025

reference sample degraded around 98.67 % after 90 days and The PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010 and PP STRAW NO ADDITIVE Samples showed 9.76 % and 0.81% respectively after 90 days.

Table 1: Percentage Biodegradation of Positive control and Test samples

Day	Percentage Biodegradation		
	Positive Control	PP STRAW 99% PE 1% Biosustainable/NEXU ECP-010	PP STRAW NO ADDITIVE
0	0.00	0.00	0.00
3	5.24	0.55	0.00
6	9.25	0.98	0.02
10	18.25	1.77	0.10
14	23.45	2.45	0.13
18	29.83	3.16	0.17
21	36.50	3.52	0.18
24	42.67	4.22	0.25
27	52.80	4.56	0.30
30	60.53	4.92	0.35
35	68.92	5.18	0.41
40	71.53	5.46	0.45
45	76.88	5.91	0.51
52	80.82	6.62	0.59
60	84.82	7.17	0.63
67	87.46	7.58	0.68
72	90.62	8.46	0.72
80	94.45	8.92	0.77
90	98.67	9.76	0.81

Reviewed By

Alok Pandey
Assistant Manager - Biodegradability Services

Authorized Signatory

Ushadevi Yadav
Deputy Manager - Biodegradability Services

---------- **End of Report** ----------

Note : The results reported relate to the sample tested only. Latest version of designated test methods has been used wherever it requires. The Test Certificate shall not be reproduced in full or part without the written permission of INTERTEK. The sample(s) has not been drawn/sampled by INTERTEK LAB. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and / or shipment and only relate to the sample(s) as received and tested. This report was prepared solely for the use of the client named in this report. Intertek disclaims any and all liability for damage or injury which results in the use of the information contained herein and accepts no responsibility for any loss, damage or liability suffered by a third party as a result of any reliance upon or use of this report. All jobs are performed as per Intertek terms & Conditions available at htpp://www.intertek.com/terms/or can be made available on request