

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 1 of 13

scan to see the report



GZIN2108046182PC

CUSTOMER NAME: ZHEJIANG JINLIANG PLASTIC VENEER CO., LTD
ADDRESS: NO.25,BAOCHENG ROAD,XIANYAN INDUSTRIAL DISTRICT,OUHAI
AREA,WENZHOU CITY,ZHEJIANG,CHINA

Sample Name : Biodegradable Cellulose Acetate Granule

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

SGS Ref. No. : 2021ESQ00489R02E
Date of Receipt : Aug 11, 2021
Testing Start Date : Aug 11, 2021
Testing End Date : Dec 16,2021
Test result(s) : For further details, please refer to the following page(s)
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for
SGS-CSTC Standards Technical
Services Co., Ltd. GZ Branch Testing
Center

manson yang
Authorized signatory



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch/Institutional Materials Laboratory

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

198 Kazhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 2 of 13

Test Item:

Ultimate aerobic biodegradability

Test Method:

ISO 14852: 2018.

Test Results:

After testing, under the present conditions of the study, percentage biodegradation of Biodegradable Cellulose Acetate Granule at the end of the test over 120 days was 67.0%, with a calculated relative biodegradation rate of 95.2%.

1 Purpose of the study

Determine the ultimate aerobic biodegradability of the test material in the dark at $23^{\circ}\text{C}\pm 1^{\circ}\text{C}$ over a period of time.

2 Principle

A measured volume of inoculated mineral medium, containing the test material as the nominal sole source of organic carbon was aerated by the passage of carbon dioxide-free air at a controlled rate in the dark. Degradation was followed by determining the carbon dioxide produced. The amount of carbon dioxide produced from the test material (corrected for that derived from the inoculum blank) was expressed as a percentage of ThCO_2 .

3 Test systems

3.1 Inoculum

The fresh activated sludge collected from the aeration tank of a water treatment plant which is mainly working on domestic sewage treatment was used as inoculum. Any coarse particles and impurities on the surface were removed from the sludge by sieving of a strainer, and this was kept in aerobic under the test temperature until being required. In the study, each 20.0 mL of the above inoculum was added into each test flask to give a final concentration of 30 mg/L (counted in solid dry weight). The aerobic plate count in the test system was 4.0×10^6 CFU/mL.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CALIBRATION
Guangzhou Standards Technical Services Co., Ltd.
Guangzhou Calibration & Technical Materials Laboratory

198 Kazhu Road, Science Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 3 of 13

3.2 Reference material

Name	microcrystalline cellulose
CAS No.	9004-34-6
Source	Sinopharm Chemical Reagent Co. LTD

3.3 Test medium

Standard test medium was used in the study, the preparation methods see ISO 14852: 2018.

4 Test methods

4.1 Test groups

Flasks 1, 2 & 3 (test material)	Containing test material, inoculum and test medium
Flasks 4, 5 & 6 (inoculum blank)	Containing only inoculum and test medium
Flasks 7, 8 & 9 (reference material)	Containing reference material, inoculum and test medium
Flask 10 (toxicity control)	Containing test material, reference material, inoculum and test medium

4.2 Addition of the test material

Each 396 mg of the test material was respectively weighed into flasks 1, 2, 3, 10, to obtain the TOC content from test material in the test suspensions of 100 mg/L.

4.3 Addition of the reference material

Each 466 mg of the reference material was respectively weighed into flasks 7, 8, 9, 10, to obtain the TOC content from reference material in the test suspensions of 100 mg/L.

4.4 Preparation of the test systems

Referring to Table 1, on the day before the test, an appropriate amount of test medium and 20.0 mL of inoculum were respectively added into each flask. These mixtures were then aerated with CO₂-free air overnight. On the day of the test, the test material and reference material were also added into flasks, and the final volumes of the suspensions in each flask were 2000 mL.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CTC Standards Technical Services Co., Ltd.
Guangzhou Chemicals Laboratory

198 Kezhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 4 of 13

Table 1 Composition of the test solution in flasks

Test vessel	Test material	Inoculum blank	Reference material	Toxicity control
	Flasks 1, 2, 3	Flasks 4, 5, 6	Flasks 7, 8, 9	Flask 10
Test medium (mL)	1980	1980	1980	1980
Inoculum initial concentration (g/L)	3.0	3.0	3.0	3.0
Inoculum (mL)	20.0	20.0	20.0	20.0
Test material (mg)	396	—	—	396
Reference material (mg)	—	—	466	466
Final volume (mL)	2000	2000	000	2000
Test material final concentration (mg/L)	198	—	—	198
TOC content from the test material (mg/L)	100	—	—	100
Reference material final concentration (mg/L)	—	—	233	233
TOC content from the reference material (mg/L)	—	—	100	100
Inoculum final concentration (mg/L)	30	30	30	30
pH value at the end	7.55, 7.52, 7.54	7.56, 7.58, 7.53	7.57, 7.59, 7.57	7.60



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CTI Standards Technical Services Co., Ltd.
Guangzhou Branch/Institutional Materials Laboratory

198 Kezhu Road, Science Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 5 of 13

4.5 Test conditions

The test was started by bubbling CO₂-free air through the suspensions with a rate of 50 - 100 mL/min at 23°C ± 1°C in the dark.

4.6 Analysis and determination

- (1) The thermometer was set to record the test temperature during the experiment period.
- (2) Checked the stirrer, test temperature and aeration every workday.
- (3) The amounts of CO₂ produced in each of the series of flasks were measured at time intervals during the experiment period.
- (4) On the days of CO₂ measurement, sodium hydroxide absorber closest to the test vessel was disconnected, then the remaining absorber was moved one place closer to the test vessel and a new absorber containing fresh 0.05 mol/L sodium hydroxide was placed at the far end of the series. The absorber which had been disconnected was titrated by 0.05008 mol/L and 0.05009 mol/L HCl using phenolphthalein and bromocresol green - methylred as the indicator. Each 10 mL (0 - 35 d) or 20 mL (39 - 120 d) of NaOH absorber solution from each of the series of flasks was taken for titration at each time.
- (5) On the last day of the test, measured the pH of each flask, acidified all the flasks with 1 ml of concentrated hydrochloric acid and aerated them overnight in order to purge to remove the carbon dioxide, measured the amounts of CO₂ produced in all absorbers.

5 Data processing

5.1 Result for total organic carbon (TOC)

TOC content of the test material and reference material were measured as 50.5% and 43.0%.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS Standards Technical Services Co., Ltd.
Guangzhou Branch

198 Kezhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 6 of 13

5.2 Calculation of percentage biodegradation

Sodium hydroxide solution was used as the absorbent in the present study. According to the respective titration values of HCl, using the following formula to calculate the weight of CO₂ produced from the inoculum blank and from each test group; the difference is the weight of CO₂ produced from the test material or reference material alone.

$$W = C \times (V_1 - V_2) \times 44$$

in the formula:

W—amounts of CO₂ produced, mg;

C—HCl concentration, mol/L;

V₁—Volume of HCl titrated absorbed NaOH, mL;

V₂—Volume of HCl titrated unabsorbed NaOH, mL.

Percentage biodegradation was calculated from:

$$\text{biodegradation}(\%) = \frac{\text{mg CO}_2 \text{ produced from test group} - \text{mg CO}_2 \text{ produced from inoculum blank}}{\text{mg TOC added in test} \times 3.67} \times 100$$

Where 3.67 is the conversion factor (44/12) for carbon to carbon dioxide, and the amount of CO₂ produced was accumulated value.

The curves of the accumulated carbon dioxide evolved and percentage biodegradation against time for each test group were drawn.

6 Test result

At the end of the test over 120 days, CO₂ evolution in the inoculum blank was 80.4 mg/L.

Percentage biodegradation of the reference material and the toxicity control were 70.4% and 45.6%, respectively. Percentage biodegradation of the three replicates from the test material at the end of the test over 120 days were respectively 66.4%, 66.2% and 68.3%, with a calculated mean of 67.0%. Details of the results are shown in Tables 2 - 3 and Fig.1 - 2.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CTI Standards Technical Services Co., Ltd.
Guangzhou Environmental & Materials Laboratory

198 Kezhu Road, Science Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 7 of 13

Table 2 Amount of CO₂ produced, mg

Time (d)	Test material						Inoculum blank			Reference material			Toxicity control	
	T1	T2	T3	T4	T5	T6	mean	Difference of the mean (%)			T7	T8	T9	T10
								T4	T5	T6				
4	68.089	78.666	83.513	10.797	11.238	10.577	10.871	0.7	3.4	2.7	52.664	45.833	44.511	89.463
7	42.087	39.443	43.189	7.272	8.594	8.153	8.006	9.2	7.3	1.8	38.782	37.901	27.764	65.224
11	24.129	22.806	23.908	6.721	7.822	7.161	7.235	7.1	8.1	1.0	32.282	37.129	29.197	30.519
14	31.951	17.187	28.205	9.475	9.034	11.458	9.989	5.1	9.6	14.7	31.510	37.680	24.900	31.731
18	29.086	36.578	37.239	11.018	9.916	8.594	9.842	11.9	0.7	12.7	41.867	40.324	33.273	29.748
21	24.569	31.400	32.282	6.721	8.924	7.822	7.822	14.1	14.1	0	29.197	38.451	27.434	25.451
25	24.569	15.755	27.654	9.585	8.924	8.924	9.145	4.8	2.4	2.4	34.265	33.383	28.315	25.891
29	33.934	35.477	33.053	7.272	7.492	9.255	8.006	9.2	6.4	15.6	31.290	21.815	30.629	29.748
32	18.289	20.713	17.849	6.390	5.950	4.407	5.582	14.5	6.6	21.1	19.832	19.171	26.002	20.933
35	15.865	13.662	13.001	4.187	4.627	4.187	4.334	3.4	6.8	3.4	21.594	14.323	13.001	18.289
39	21.319	18.785	23.743	4.352	4.242	3.911	4.168	4.4	1.8	6.2	18.344	16.912	22.311	16.471
42	13.331	11.348	11.899	4.077	4.958	4.848	4.627	11.9	7.1	4.8	15.755	13.111	12.119	17.628
44	17.077	17.959	15.314	3.085	2.865	2.754	2.901	6.3	1.3	5.1	15.425	18.069	9.475	19.391
48	25.230	25.451	24.239	0.661	0.881	0.771	0.771	14.3	14.3	0	21.705	28.315	28.756	6.170
52	25.010	22.586	29.307	1.102	1.322	0.992	1.138	3.2	16.1	12.9	17.518	30.298	23.137	40.545
56	24.790	20.493	24.018	1.873	2.424	2.093	2.130	12.1	13.8	1.7	18.840	24.790	22.917	27.324
61	30.078	23.798	23.357	1.763	1.763	1.653	1.726	2.1	2.1	4.3	33.934	31.400	21.705	21.815
64	15.480	19.116	22.862	3.140	2.259	2.589	2.663	17.9	15.2	2.8	27.709	24.184	16.251	20.989



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CAL Standards Technical Services Co., Ltd.
Guangzhou Environmental and Materials Laboratory

198 Kezhu Road, Science Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 8 of 13

Table 2 Amount of CO₂ produced, mg (continued)

Time (d)	Test material						Inoculum blank			Reference material				Toxicity control
	T1	T2	T3	T4	T5	T6	mean	Difference of the mean (%)			T7	T8	T9	T10
								T4	T5	T6				
68	19.942	17.298	17.959	1.983	2.534	1.873	2.130	6.9	19.0	12.1	27.213	21.154	18.510	15.865
71	12.174	15.810	9.640	2.589	3.471	2.809	2.956	12.4	17.4	5.0	34.650	16.251	23.633	19.997
75	10.577	13.221	14.103	3.085	3.085	2.534	2.901	6.3	6.3	12.7	23.688	11.128	18.510	18.840
78	11.734	12.615	10.522	1.487	1.377	1.818	1.561	4.7	11.8	16.5	18.234	11.734	20.548	14.268
82	14.767	15.648	11.791	1.984	2.094	1.653	1.910	3.8	9.6	13.5	12.122	14.877	17.411	11.350
85	8.651	8.981	11.626	3.471	4.463	3.251	3.728	6.9	19.7	12.8	11.846	10.744	12.067	21.103
89	14.711	16.364	11.626	3.361	4.132	4.794	4.096	17.9	0.9	17.0	10.965	10.744	15.042	25.180
90	3.581	4.243	1.267	0.937	0.937	1.157	1.010	7.3	7.3	14.5	4.353	3.361	4.132	9.753
92	4.188	4.408	5.840	3.086	2.975	3.526	3.196	3.4	6.9	10.3	5.951	5.400	4.298	10.138
96	5.179	5.290	3.857	2.975	2.975	2.204	2.718	9.5	9.5	18.9	2.865	3.747	2.094	10.138
99	12.177	9.863	7.989	3.251	3.030	3.141	3.141	3.5	3.5	0	11.185	6.777	9.422	18.458
106	15.483	11.626	13.058	10.304	10.855	10.193	10.450	1.4	3.9	2.5	12.177	12.948	13.609	36.751
113	13.775	17.081	10.799	9.697	9.697	8.926	9.440	2.7	2.7	5.4	15.869	15.979	12.012	40.002
120	15.979	23.362	17.632	9.918	11.681	10.138	10.579	6.2	10.4	4.2	19.505	20.166	27.219	41.324



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CALCULATED STANDARDS TECHNICAL SERVICES CO., LTD.
Guangzhou Branch, Guangzhou Calibration and Testing Laboratory

198 Kazhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 9 of 13

Table 3 Percentage biodegradation, %

Time (d)	Test material					Reference material					Toxicity control		
	T1	T2	T3	mean	Relative biodegradation rate	T7	T8	T9	mean	Difference of the mean (%)			T10
										T7	T8	T9	
4	7.8	9.2	9.9	9.0	179.0	5.7	4.8	4.6	5.0	13.6	5.0	8.6	5.4
7	12.4	13.5	14.7	13.5	156.4	9.9	8.8	7.3	8.7	14.1	2.0	16.1	9.3
11	14.7	15.6	17.0	15.8	129.8	13.3	12.9	10.3	12.2	9.4	6.2	15.6	10.8
14	17.7	16.6	19.4	17.9	119.0	16.2	16.7	12.3	15.1	7.7	10.7	18.4	12.3
18	20.4	20.3	23.2	21.3	112.1	20.6	20.8	15.5	19.0	8.5	9.8	18.4	13.7
21	22.6	23.5	26.5	24.2	108.9	23.5	25.0	18.2	22.2	5.8	12.5	18.3	14.9
25	24.7	24.4	29.0	26.0	102.8	26.9	28.3	20.8	25.3	6.3	11.7	18.0	16.0
29	28.3	28.1	32.4	29.6	105.6	30.1	30.2	23.9	28.0	7.3	7.6	14.9	17.5
32	30.0	30.2	34.1	31.4	103.9	32.0	32.0	26.6	30.2	6.0	6.0	11.9	18.5
35	31.6	31.5	35.3	32.8	102.8	34.4	33.4	27.8	31.9	7.9	4.8	12.7	19.5
39	33.9	33.4	38.0	35.1	103.5	36.3	35.1	30.3	33.9	7.1	3.6	10.7	20.3
42	35.1	34.4	39.0	36.1	102.8	37.8	36.3	31.3	35.1	7.7	3.3	10.9	21.2
44	37.0	36.4	40.6	38.0	103.6	39.5	38.4	32.2	36.7	7.7	4.5	12.3	22.3
48	40.4	39.8	43.8	41.3	102.9	42.4	42.1	36.0	40.2	5.5	4.8	10.3	22.7
52	43.6	42.7	47.7	44.7	103.3	44.6	46.1	39.0	43.2	3.2	6.6	9.8	25.4
56	46.7	45.2	50.7	47.5	103.4	46.9	49.2	41.8	46.0	2.0	7.0	9.0	27.1
61	50.6	48.2	53.6	50.8	102.2	51.3	53.2	44.6	49.7	3.2	7.1	10.3	28.5



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CALCULATED STANDARDS TECHNICAL SERVICE CO., LTD.
Guangzhou Branch, Guangzhou Environmental Materials Laboratory

198 Kazhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgs.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 10 of 13

Table 3 Percentage biodegradation, % (continued)

Time (d)	Test material					Reference material					Toxicity control T10		
	T1	T2	T3	mean	Relative biodegradatio n rate	T7	T8	T9	mean	Difference of the mean (%)			
										T7		T8	T9
64	52.3	50.4	56.4	53.0	101.2	54.7	56.1	46.4	52.4	4.4	7.1	11.5	29.7
68	54.7	52.5	58.5	55.3	100.1	58.1	58.7	48.7	55.2	5.4	6.5	11.8	30.7
71	56.0	54.3	59.4	56.6	97.3	62.4	60.6	51.5	58.2	7.4	4.1	11.5	31.8
75	57.0	55.7	61.0	57.9	96.2	65.3	61.7	53.6	60.2	8.5	2.5	10.9	32.9
78	58.4	57.2	62.2	59.3	95.2	67.5	63.1	56.2	62.3	8.5	1.3	9.8	33.8
82	60.2	59.0	63.5	60.9	95.1	68.9	64.8	58.3	64.0	7.7	1.3	8.9	34.4
85	60.8	59.8	64.6	61.7	94.8	70.0	65.8	59.4	65.1	7.6	1.1	8.7	35.6
89	62.3	61.4	65.6	63.1	95.3	71.0	66.7	60.9	66.2	7.2	0.7	8.0	37.0
90	62.6	61.9	65.7	63.4	95.2	71.4	67.0	61.3	66.6	7.3	0.6	7.9	37.6
92	62.8	62.0	66.0	63.6	95.1	71.8	67.3	61.5	66.9	7.4	0.7	8.0	38.1
96	63.1	62.4	66.2	63.9	95.5	71.8	67.4	61.4	66.9	7.4	0.8	8.2	38.6
99	64.3	63.3	66.8	64.8	95.7	72.9	67.9	62.3	67.7	7.7	0.3	8.0	39.7
106	65.0	63.5	67.2	65.2	95.9	73.2	68.3	62.7	68.0	7.5	0.3	7.9	41.4
113	65.6	64.5	67.4	65.8	95.8	74.0	69.2	63.0	68.8	7.7	0.6	8.3	43.5
120	66.4	66.2	68.3	67.0	95.2	75.3	70.5	65.3	70.4	7.0	0.2	7.2	45.6



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-Standard Technical Services Co., Ltd.
Guangzhou Branch/Technical Services Laboratory

198 Kexhu Road, Scientech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 11 of 13

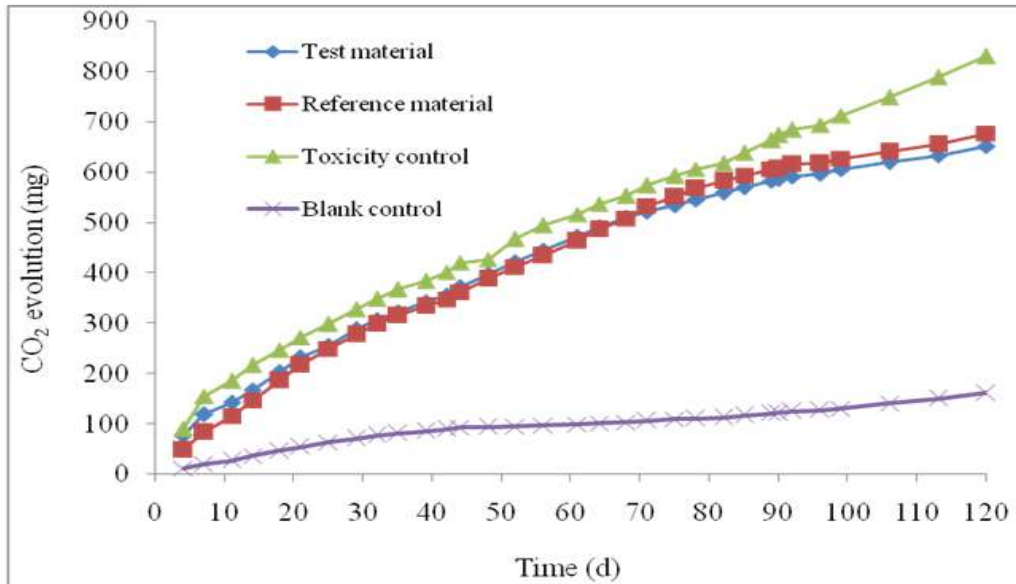


Fig. 1 Carbon dioxide evolved (accumulated) curves

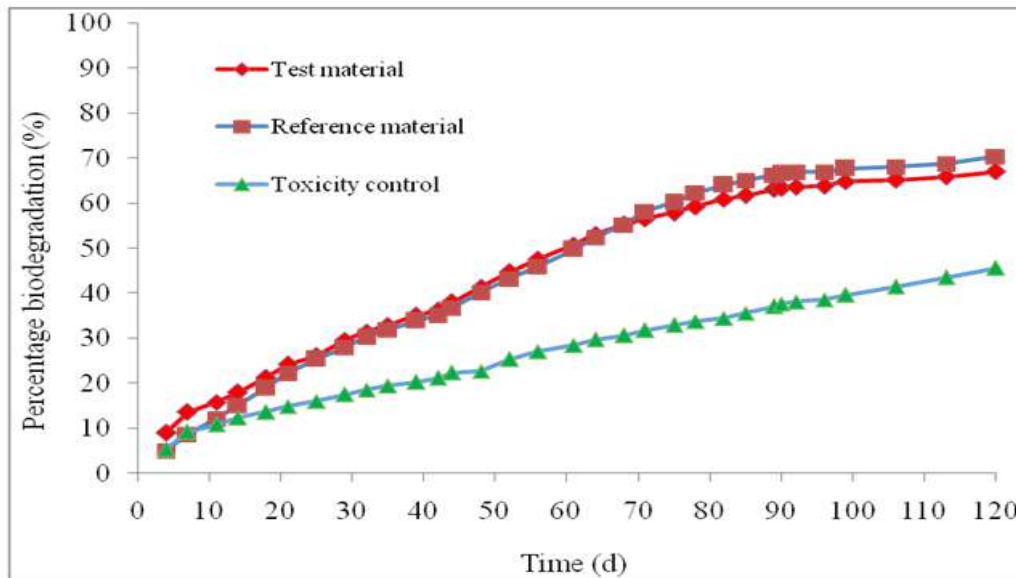


Fig. 2 Biodegradation curves of the test



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-Standard Technical Services Co., Ltd.
Guangzhou Branch/Institutional Materials Laboratory

198 Kazhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 12 of 13

7 Validity of the test

- At the end of the test, the degree of biodegradation of the reference material was > 60%.
- At the end of the test, the difference between the percentage biodegradation of the reference material in the different vessels was less than 20%.
- At the end of the test, the amount of carbon dioxide which had evolved from the inoculum blank was less than 90 mg/L.
- At the plateau phase or at the end of the test, the amount of carbon dioxide evolved from the three inoculum blanks was less than 20% of the mean.

The above results revealed that the test results were valid.

8 Test result

Under the present conditions of the study, percentage biodegradation of Biodegradable Cellulose Acetate Granule at the end of test over 120 days was 67.0%, with a calculated relative biodegradation rate of 95.2%.

Remark:

The above test was carried out by external laboratory assessed as competent.



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CTI Standards Technical Services Co., Ltd.
Guangzhou Branch/Institutional Materials Laboratory

198 Kazhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com

TEST REPORT

No. : GZIN2108046182PC

Date : Dec 31,2021

Page: 13 of 13

Sample photo



***** End of report*****



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS Standards Technical Services Co., Ltd.
Guangzhou Branch

198 Kezhu Road, Sciencetech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155661 f (86-20) 82075080 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155661 f (86-20) 82075080 e sgs.china@sgs.com