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NTSQP

Report Number NTSQP[2024]C0068

China National Centre for Quality Supervision & Test of Plastic Products (Beijing)

Institute of Plastic Processing & Application of Light Industry

Test Report

Clients*	Naikos(Xiamen) Adhesive Tape Co.,Ltd.
Sample Name*	Cellulose Biodegradable Tape
Inspection Sort	Entrust Test
Date of Report	Jan. 26, 2024

Matters need attention

1. The client's objection, in case there is any, shall be submitted in the written form within 15days upon receipt of the test report. No acceptance shall be allowed when the objection is overdue.

2. The test report shall be invalid to have no Report Cachet when it was copied.

3. The test report shall be invalid when it is incomplete.

4. The test report is responsible to the client only for the submitted sample(s).

5. The content of the items with the symbol '*' and Client's statement is supplied by the Client, Center is not responsible to confirm it's authenticity.

6. The Chinese and English versions have been made. Should there be any differences in interpretation, the Chinese version would be the controlling document.

7. The legal liability of the report issued by China National Centre for Quality Supervision & Test of Plastic Products (Beijing) shall be borne by Institute of Plastic Processing & Application of Light Industry.

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Test Report

NTSQP

Report No.: NTSQP[2024]C0068 Sample No.: 2023E0201

Clients* Address*	Naikos(Xiamen) Adhesive Tape Co.,Ltd. No.89, Siming Industrial Park, Meixi Street,Tong'an District, Xiamen, China /361100	Contact Man* Telephone No.*	Eric Zheng 15080327171
Sample Name*	Cellulose Biodegradable Tape	Trade Mark*	NAIKOS
Type and Specification*	4.4cm×100m per roll		
Producer*	Naikos(Xiamen) Adhesive Tape Co.,Ltd.		
Quantity of Sample	2 rolls (Net weight not less than 500g)		

Date of Production*	Mar. 17, 2023	Receiving Date	Mar. 23, 2023	Testing Period	Mar. 26, 2023 - Oct. 10, 2023
Descriptions of Sample	Samples are light yellow tapes with green pattern. Statement of the client: the sample is cellulose biodegradable tape + water-based degradable pressure-sensitive adhesive.				

No.	Item(s) Tested	Test Result(s)	Standard of Test
01	Organic components (Volatile solids content)，%	99.8	YZ/T 0160.2-2017
02	Relative degree of biodegradation (180d)，%	91.3	YZ/T 0160.2-2017
	(The biodegradation procedure and curve, are given in annex)		
	(No text below this column)		
Note	----		

China National Centre for Quality Supervision & Test of Plastic Products (Beijing)
seal for testing

Institute of Plastic Processing & Application of Light Industry (Legal entity)
seal for testing

Approved by: Reviewed by: Date of Report: Jan. 26, 2024

APPENDIX

Controlled aerobic composting test-----Test Report

Sample: Cellulose Biodegradable Tape Reference material: Cellulose

Origin of Compost: BEIJING Age of compost: 3 Months

Volume of test vessels: 3L

Method of CO_2 determination: The CO_2 in the exhaust air was measured directly with a continuous infrared analyser.

Reference standard: GB/T 19277.1-2011

Result of the test

	45d degree of biodegradation %	180d degree of biodegradation %
Sample	43.6	84.5
Reference material	70.6	92.6

Validity criteria:

1) Whether the degree of biodegradation of reference material after 45day＞70%?

☑YES □NO

2) Dose mean CO_2 production in the blank vessels after 10days in the range 50mg to 150mg CO_2/g volatile solids?

☑YES □NO

APPENDIX

Table 1 Basic properties of sample

Samples	Appearance	Dry solids (%)	Moisture (%)	TOC in dry solid (%)	$ThCO_2$ (CO_2g/100g sample)
Test material	tape	94.40	5.60	52.61	192.90
Reference material	powder	99.82	0.18	43.40	159.13

Table 2 Volume of evolved CO_2 and rate of biodegradation

Day	$(CO_2)_{B1}$ g	$(CO_2)_{B2}$ g	D_1 %	$(CO_2)_{B3}$ g	D_2 %
180	75.0	147.4	92.6	163.0	84.5

$(CO_2)_{B1}$: volume of CO_2 evolved from blank vessel

$(CO_2)_{B2}$ volume of CO_2evolved from reference material

$(CO_2)_{B3}$ volume of CO_2 evolved from sample

D_1 : reference material's rate of biodegradation

D_2 : sample's rate of biodegradation

Table 3 Volume of evolved CO_2 and rate of biodegradation

Day	Evolved CO_2, g					Degree of biodegradation,%	
	Blank	Cellulose	2023E0201	Cellulose(actual)	2023E0201(actual)	Cellulose	2023E0201
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	2.34	3.05	2.56	0.71	0.22	0.45	0.11
2	4.90	6.07	5.00	1.17	0.10	0.74	0.05
3	7.21	9.08	7.58	1.87	0.37	1.18	0.19
4	9.15	12.01	10.24	2.86	1.09	1.80	0.57
5	10.98	15.22	13.16	4.24	2.18	2.66	1.13
6	12.79	18.72	16.50	5.93	3.71	3.73	1.92
7	14.45	22.34	19.87	7.89	5.42	4.96	2.81
8	16.60	26.04	23.60	9.44	7.00	5.93	3.63
9	18.63	29.83	27.35	11.20	8.72	7.04	4.52
10	19.71	33.73	30.86	14.02	11.15	8.81	5.78
11	20.85	37.77	34.35	16.92	13.50	10.63	7.00
12	22.32	41.79	37.73	19.47	15.41	12.24	7.99
13	23.76	45.83	40.91	22.07	17.15	13.87	8.89

APPENDIX

Report No.: NTSQP[2024]C0068

Day	Evolved CO_2, g					Degree of biodegradation,%	
	Blank	Cellulose	2023E0201	Cellulose(actual)	2023E0201(actual)	Cellulose	2023E0201
14	25.16	49.86	44.19	24.70	19.03	15.52	9.87
15	26.52	53.90	47.34	27.38	20.82	17.21	10.79
16	27.83	57.93	50.51	30.10	22.68	18.92	11.76
17	29.20	61.94	53.57	32.74	24.37	20.57	12.63
18	30.58	65.79	56.74	35.21	26.16	22.13	13.56
19	31.94	69.60	60.01	37.66	28.07	23.67	14.55
20	33.24	73.55	63.20	40.31	29.96	25.33	15.53
21	34.52	77.41	66.24	42.89	31.72	26.95	16.44
22	35.86	81.23	69.24	45.37	33.38	28.51	17.30
23	36.99	85.00	72.15	48.01	35.16	30.17	18.23
24	38.19	88.60	75.10	50.41	36.91	31.68	19.13
25	39.36	92.21	78.11	52.85	38.75	33.21	20.09
26	40.53	95.94	81.03	55.41	40.50	34.82	21.00
27	41.65	99.80	84.04	58.15	42.39	36.54	21.98
28	42.77	103.68	87.18	60.91	44.41	38.28	23.02
29	43.83	107.66	90.40	63.83	46.57	40.11	24.14
30	44.90	111.68	93.74	66.78	48.84	41.97	25.32
31	45.80	115.77	96.98	69.97	51.18	43.97	26.53
32	46.69	119.85	100.35	73.16	53.66	45.97	27.82
33	47.50	123.98	103.55	76.48	56.05	48.06	29.06
34	48.32	127.78	106.78	79.46	58.46	49.93	30.31
35	49.10	131.35	109.96	82.25	60.86	51.69	31.55
36	49.78	134.88	113.03	85.10	63.25	53.48	32.79
37	50.47	138.41	116.07	87.94	65.60	55.26	34.01
38	51.09	142.12	119.05	91.03	67.96	57.20	35.23
39	51.69	145.78	121.96	94.09	70.27	59.13	36.43
40	52.25	149.60	124.82	97.35	72.57	61.18	37.62
41	52.78	153.27	127.73	100.49	74.95	63.15	38.85
42	53.33	156.88	130.63	103.55	77.30	65.07	40.07
43	53.87	160.42	133.55	106.55	79.68	66.96	41.31
44	54.40	163.89	136.33	109.49	81.93	68.81	42.47
45	54.86	167.28	138.96	112.42	84.10	70.65	43.60
46	55.35	170.43	141.41	115.08	86.06	72.32	44.61
47	55.79	173.35	143.77	117.56	87.98	73.88	45.61

APPENDIX

Report No.: NTSQP[2024]C0068

Day	Evolved CO_2, g					Degree of biodegradation,%	
	Blank	Cellulose	2023E0201	Cellulose(actual)	2023E0201(actual)	Cellulose	2023E0201
48	56.24	176.20	146.12	119.96	89.88	75.38	46.59
49	56.72	179.11	148.43	122.39	91.71	76.91	47.54
50	57.28	181.52	150.70	124.24	93.42	78.07	48.43
51	57.74	183.89	152.72	126.15	94.98	79.27	49.24
52	58.19	185.85	154.69	127.66	96.50	80.22	50.03
53	58.65	187.73	156.54	129.08	97.89	81.12	50.75
54	59.05	189.39	158.32	130.34	99.27	81.91	51.46
55	59.46	190.88	160.06	131.42	100.60	82.59	52.15
56	59.84	192.10	161.82	132.26	101.98	83.11	52.87
57	60.21	193.28	163.46	133.07	103.25	83.62	53.53
58	60.61	194.39	165.07	133.78	104.46	84.07	54.15
59	61.00	195.19	166.75	134.19	105.75	84.33	54.82
60	61.39	195.93	168.40	134.54	107.01	84.55	55.47
61	61.78	196.67	170.02	134.89	108.24	84.77	56.11
62	62.14	197.26	171.77	135.12	109.63	84.91	56.83
63	62.53	197.76	173.44	135.23	110.91	84.98	57.50
64	62.93	198.23	175.13	135.30	112.20	85.02	58.16
65	63.35	198.72	176.82	135.37	113.47	85.07	58.82
66	63.76	199.14	178.48	135.38	114.72	85.08	59.47
67	64.18	199.59	180.11	135.41	115.93	85.09	60.10
68	64.57	200.02	181.73	135.45	117.16	85.12	60.74
69	64.96	200.52	183.34	135.56	118.38	85.19	61.37
70	65.34	201.06	184.87	135.72	119.53	85.29	61.96
71	65.72	201.54	186.43	135.82	120.71	85.35	62.58
72	66.04	202.01	188.07	135.97	122.03	85.45	63.26
73	66.44	202.42	189.63	135.98	123.19	85.45	63.86
74	66.83	202.81	191.19	135.98	124.36	85.45	64.47
75	67.16	203.23	192.79	136.07	125.63	85.51	65.13
76	67.57	203.64	194.44	136.07	126.87	85.51	65.77
77	67.95	204.07	196.01	136.12	128.06	85.54	66.39
78	68.26	204.52	197.79	136.26	129.53	85.63	67.15
79	68.58	205.01	199.59	136.43	131.01	85.73	67.92
80	68.87	205.47	201.30	136.60	132.43	85.84	68.65
81	69.16	206.02	203.05	136.86	133.89	86.01	69.41

APPENDIX

Day	Evolved CO_2, g					Degree of biodegradation,%	
	Blank	Cellulose	2023E0201	Cellulose(actual)	2023E0201(actual)	Cellulose	2023E0201
82	69.38	206.71	204.67	137.33	135.29	86.30	70.13
83	69.60	207.44	206.28	137.84	136.68	86.62	70.86
84	69.83	208.08	207.74	138.25	137.91	86.88	71.49
85	70.07	208.63	209.20	138.56	139.13	87.07	72.13
86	70.28	209.21	210.56	138.93	140.28	87.31	72.72
87	70.47	209.78	211.98	139.31	141.51	87.54	73.36
88	70.67	210.34	213.31	139.67	142.64	87.77	73.95
89	70.86	210.96	214.56	140.10	143.70	88.04	74.49
90	71.00	211.49	215.83	140.49	144.83	88.29	75.08
91	71.14	211.94	217.01	140.80	145.87	88.48	75.62
92	71.25	212.35	218.16	141.10	146.91	88.67	76.16
93	71.38	212.77	219.21	141.39	147.83	88.85	76.64
94	71.49	213.08	220.13	141.59	148.64	88.98	77.06
95	71.62	213.35	220.98	141.73	149.36	89.07	77.43
96	71.72	213.69	221.71	141.97	149.99	89.22	77.76
97	71.81	214.06	222.39	142.25	150.58	89.39	78.06
98	71.91	214.38	223.02	142.47	151.11	89.53	78.34
99	71.99	214.71	223.61	142.72	151.62	89.69	78.60
100	72.05	215.06	224.16	143.01	152.11	89.87	78.85
101	72.12	215.40	224.65	143.28	152.53	90.04	79.07
102	72.17	215.78	225.14	143.61	152.97	90.25	79.30
103	72.24	216.12	225.55	143.88	153.31	90.42	79.48
104	72.29	216.41	226.02	144.12	153.73	90.57	79.69
105	72.32	216.73	226.57	144.41	154.25	90.75	79.96
106	72.36	216.97	226.97	144.61	154.61	90.88	80.15
107	72.41	217.18	227.34	144.77	154.93	90.98	80.32
108	72.44	217.43	227.71	144.99	155.27	91.11	80.49
109	72.49	217.65	228.06	145.16	155.57	91.22	80.65
110	72.52	217.93	228.45	145.41	155.93	91.38	80.83
111	72.54	218.14	228.79	145.60	156.25	91.50	81.00
112	72.59	218.33	229.15	145.74	156.56	91.59	81.16
113	72.65	218.50	229.47	145.85	156.82	91.65	81.30
114	72.69	218.62	229.80	145.93	157.11	91.70	81.45
115	72.73	218.74	230.07	146.01	157.34	91.76	81.57

APPENDIX

Day	Evolved CO_2, g					Degree of biodegradation,%	
	Blank	Cellulose	2023E0201	Cellulose(actual)	2023E0201(actual)	Cellulose	2023E0201
116	72.76	218.83	230.38	146.07	157.62	91.79	81.71
117	72.79	218.94	230.65	146.15	157.86	91.84	81.84
118	72.82	219.01	230.90	146.19	158.08	91.87	81.95
119	72.86	219.08	231.14	146.22	158.28	91.89	82.05
120	72.91	219.15	231.42	146.24	158.51	91.90	82.17
121	72.96	219.23	231.62	146.27	158.66	91.92	82.25
122	72.96	219.31	231.83	146.35	158.87	91.97	82.36
123	72.99	219.37	232.00	146.38	159.01	91.99	82.43
124	73.06	219.44	232.26	146.38	159.20	91.99	82.53
125	73.09	219.52	232.42	146.43	159.33	92.02	82.60
126	73.13	219.59	232.63	146.46	159.50	92.04	82.69
127	73.16	219.66	232.81	146.50	159.65	92.06	82.76
128	73.20	219.74	232.95	146.54	159.75	92.09	82.81
129	73.22	219.82	233.09	146.60	159.87	92.13	82.88
130	73.25	219.90	233.24	146.65	159.99	92.16	82.94
131	73.29	219.98	233.40	146.69	160.11	92.18	83.00
132	73.31	220.02	233.53	146.71	160.22	92.20	83.06
133	73.36	220.10	233.70	146.74	160.34	92.21	83.12
134	73.40	220.15	233.87	146.75	160.47	92.22	83.19
135	73.42	220.22	234.04	146.80	160.62	92.25	83.27
136	73.47	220.27	234.17	146.80	160.70	92.25	83.31
137	73.51	220.34	234.32	146.83	160.81	92.27	83.36
138	73.55	220.40	234.42	146.85	160.87	92.28	83.40
139	73.59	220.46	234.57	146.87	160.98	92.30	83.45
140	73.62	220.54	234.74	146.92	161.12	92.33	83.53
141	73.66	220.62	234.87	146.96	161.21	92.35	83.57
142	73.69	220.70	234.97	147.01	161.28	92.38	83.61
143	73.71	220.77	235.06	147.06	161.35	92.42	83.64
144	73.74	220.84	235.17	147.10	161.43	92.44	83.69
145	73.80	220.91	235.30	147.11	161.50	92.45	83.72
146	73.83	220.97	235.40	147.14	161.57	92.47	83.76
147	73.85	221.03	235.53	147.18	161.68	92.49	83.82
148	73.91	221.09	235.68	147.18	161.77	92.49	83.86
149	73.96	221.15	235.83	147.19	161.87	92.50	83.91

APPENDIX

Day	Evolved CO_2, g					Degree of biodegradation,%	
	Blank	Cellulose	2023E0201	Cellulose(actual)	2023E0201(actual)	Cellulose	2023E0201
150	73.99	221.22	235.96	147.23	161.97	92.52	83.97
151	74.03	221.29	236.10	147.26	162.07	92.54	84.02
152	74.07	221.34	236.23	147.27	162.16	92.55	84.06
153	74.10	221.39	236.39	147.29	162.29	92.56	84.13
154	74.13	221.42	236.53	147.29	162.40	92.56	84.19
155	74.15	221.46	236.67	147.31	162.52	92.57	84.25
156	74.19	221.50	236.77	147.31	162.58	92.57	84.28
157	74.23	221.56	236.89	147.33	162.66	92.58	84.32
158	74.25	221.60	236.96	147.35	162.71	92.60	84.35
159	74.32	221.63	237.07	147.31	162.75	92.57	84.37
160	74.34	221.69	237.14	147.35	162.80	92.60	84.40
161	74.38	221.72	237.18	147.34	162.80	92.59	84.40
162	74.42	221.75	237.24	147.33	162.82	92.58	84.41
163	74.45	221.79	237.30	147.34	162.85	92.59	84.42
164	74.48	221.84	237.38	147.36	162.90	92.60	84.45
165	74.50	221.89	237.44	147.39	162.94	92.62	84.47
166	74.54	221.92	237.47	147.38	162.93	92.62	84.46
167	74.57	221.95	237.53	147.38	162.96	92.62	84.48
168	74.61	221.99	237.57	147.38	162.96	92.62	84.48
169	74.66	222.02	237.63	147.36	162.97	92.60	84.48
170	74.72	222.06	237.67	147.34	162.95	92.59	84.47
171	74.74	222.09	237.73	147.35	162.99	92.60	84.49
172	74.77	222.14	237.76	147.37	162.99	92.61	84.49
173	74.79	222.17	237.79	147.38	163.00	92.62	84.50
174	74.83	222.21	237.84	147.38	163.01	92.62	84.50
175	74.87	222.25	237.88	147.38	163.01	92.62	84.50
176	74.90	222.28	237.92	147.38	163.02	92.62	84.51
177	74.94	222.31	237.96	147.37	163.02	92.61	84.51
178	75.01	222.35	237.99	147.34	162.98	92.59	84.49
179	75.03	222.38	238.05	147.35	163.02	92.60	84.51
180	75.05	222.42	238.09	147.37	163.04	92.61	84.52

APPENDIX

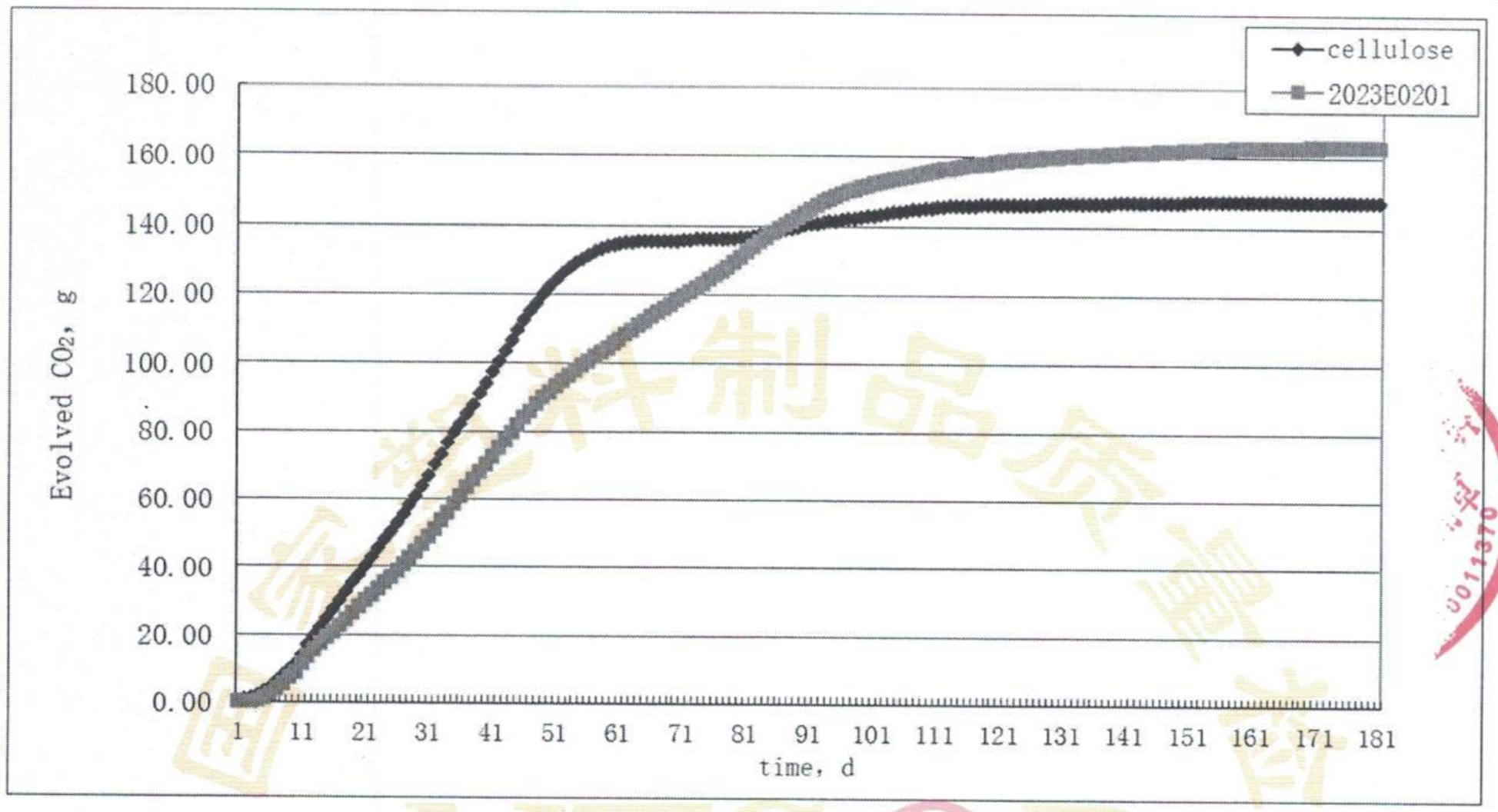

Fig.1 Curve of evolved CO_2

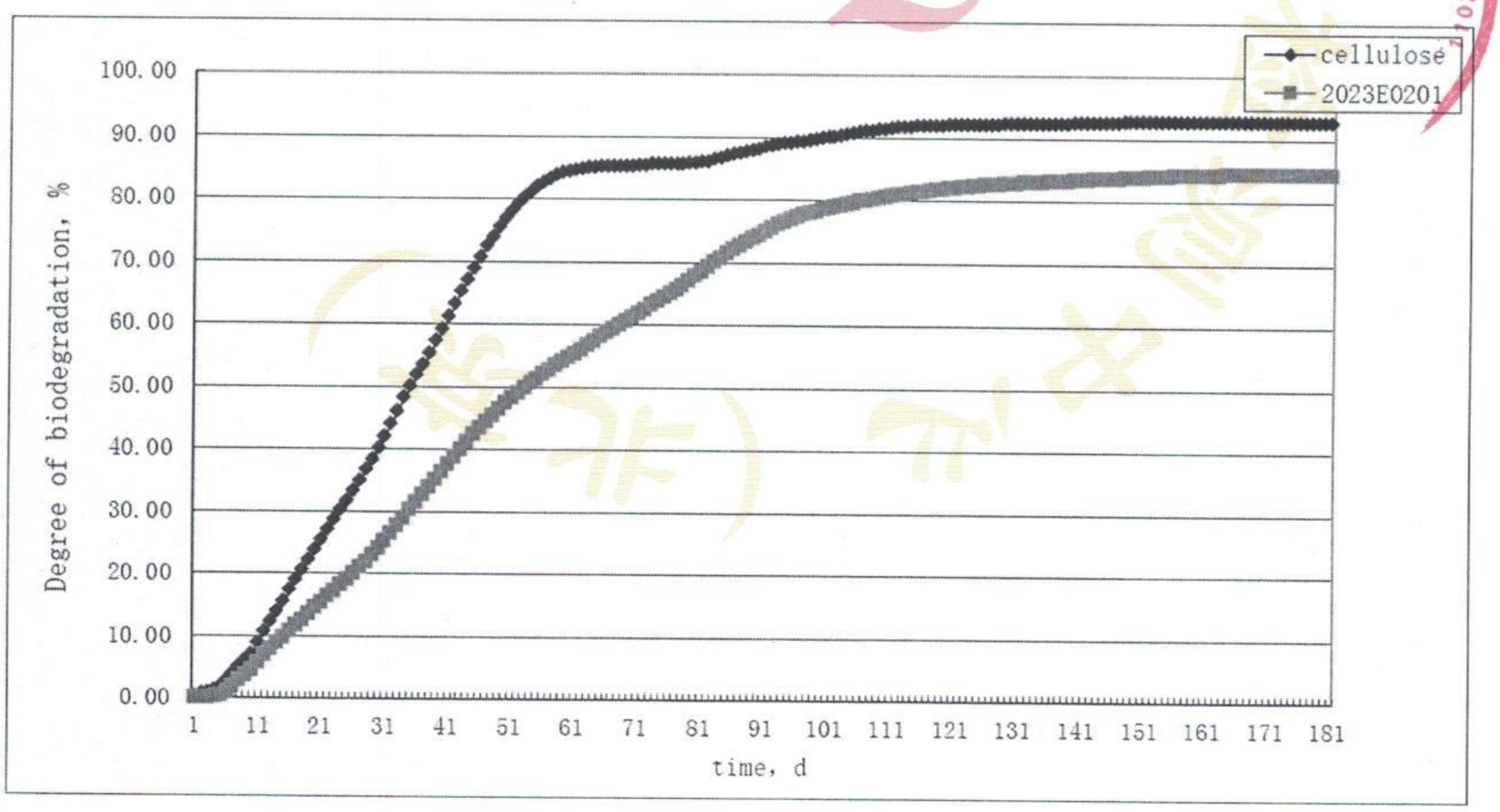

Fig.2 Curve of degree of biodegradation

————End————