



STC Test Report

Date : 2016-03-24
No. : HP293569

Page 1 of 18

- Applicant** : Recent Toys
1001 Je Amsterdam
Netherlands

Attn: Uwe Meffert/ Jing Meffert
- Description of Samples** : Four pieces of submitted sample said to be:
MOLECUBE (see attached photo)
- Date Samples Received** : 2016-03-10
- Date Tested** : 2016-03-10 to 2016-03-17
- Investigation Requested** :
- (1) ASTM Standard Consumer Safety Specification on Toy Safety, F963-11:
 - physical and mechanical tests
 - flammability test
 - heavy metals content
 - (2) USA Consumer Product Safety Improvement Act
 - Sec. 101(a): Children's products containing lead - Total lead content for substrate
 - Phthalates content as required by
 - Section 108, USA Consumer Product Safety Improvement Act
 - Proposed rule of 16 CFR 1307
 - (3) European Standard for Safety of Toys
 - EN71-1:2014
 - EN71-2:2011+A1:2014
 - EN71-3:2013+A1:2014
 - (4) European Regulation (EU) No. 1907/2006(REACH) Annex XVII and its amendment – Phthalate content (Formerly directive: EC Directive 2005/84/EC).
 - (5) Polycyclic Aromatic Hydrocarbons (PAHs).



WONG Wing-cheung, Benny
Authorized Signatory
Toys & Children's Products Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.



STC Test Report

Date : 2016-03-24
No. : HP293569

Page 2 of 18

Conclusions : The submitted sample(s) **complied** with the test requirements:

ASTM F963-11: physical and mechanical tests

ASTM F963-11: flammability test

ASTM F963-11: heavy metals content

USA Consumer Product Safety Improvement Act, Sec. 101(a):
Total lead content for substrate in children's products

USA Consumer Product Safety Improvement Act, Sec. 108 &
proposed rule of 16 CFR1307: Phthalates content

EN71-1:2014

EN71-2:2011+A1:2014

EN71-3:2013+A1:2014

European Regulation (EU) No. 1907/2006(REACH) Annex XVII
and its amendment – Phthalate content

Polycyclic Aromatic Hydrocarbons (PAHs) requirement in Annex
XVII Item 50 of the REACH Regulation (EC) No. 1907/2006 and
Amendment (EU) No. 1272/2013

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STC Test Report

Date : 2016-03-24
No. : HP293569

Page 3 of 18

AGE GRADING:

The sample was age graded with the marking of "Ages 9+"; However, it was considered appropriate for children of 72 months and up.

AGE GRADING FOR TESTING:

72 months and up.

Test Results :

1. ASTM F963-11

1.1 Mechanical and physical hazards

Ref.: ASTM F963-11

Applicable requirements before and after use and abuse testing:

<u>Applicable Section</u>	<u>Description</u>	<u>Result</u>
4	<u>Safety requirements</u>	
4.1	Material quality	Pass
4.2	Flammability	Pass* ¹
4.3	Toxicology	Pass* ¹
4.7	Accessible edges	Pass
4.9	Accessible Points	Pass
4.11	Nails and Fasteners	Pass
5	<u>Labeling requirements</u>	
5.2	Age grading labeling	Pass
5.16	Promotional materials	Pass
7	<u>Producer's markings</u>	
7.1	Name and address of the producer or distributor	Pass

*¹ = Refer to the relevant test results at the following pages.

Use and abuse testing:

<u>Applicable section</u>	<u>Description</u>	<u>Test Condition</u>
8.5	Normal use testing	
8.6	Abuse testing	
8.7	Impact tests	4 drops at 3 ft.
8.8	Torque tests	4 in-lbs.
8.9	Tension tests	15 lbs.
8.10	Compression tests	30 lbs.

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STC Test Report

Date : 2016-03-24
No. : HP293569

Page 4 of 18

1.2 Flammability test of material other than textiles

Ref.: ASTM F963-11 Section 4.2
Method used: FHSA 16 CFR 1500.44
Result: Pass

<u>Sample</u>	<u>Burn rate (in/sec.)</u>
Cube	DNI

DNI = Did Not Ignite.

Note 1: The burning rate should not be greater than 0.1 inch per second.

1.3 Heavy element

Ref.: ASTM F963-11 Section 4.3.5
Method: ASTM F963-11 Section 8.3
Determined by: Inductively Coupled Argon Plasma Atomic Emission Spectrophotometer

Toys Substrate Materials

Ref.: ASTM F963-11 Section 4.3.5.2

Polymeric material

- (a) Ball: red plastic
- (b) Inner part: dull black plastic
- (c) Ball: yellow plastic
- (d) Ball: orange plastic
- (e) Ball: dark blue plastic
- (f) Ball: green plastic
- (g) Ball: purple plastic
- (h) Ball: light blue plastic
- (i) Ball: black plastic
- (j) Ball: white plastic
- (k) Inner part: dull white plastic

Metallic material

- (l) Joint: silver color metal
- (m) Screws: silver color metal

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STC Test Report

Date : 2016-03-24

Page 5 of 18

No. : HP293569

Sample no.	Total Lead content, ppm
(a)	<10
(b)	<10
(c)	<10
(d)	<10
(e)	<10
(f)	<10
(g)	<10
(h)	<10
(i)	<10
(j)	<10
(k)	<10
(l)	<10
(m)	<10
Limit	100

Sample no.	Soluble heavy metal content, ppm							
	Lead	Cadmium	Chromium	Barium	Antimony	Arsenic	Mercury	Selenium
(a)	<2	<2	<2	<2	<2	<2	<2	<2
(b)	<2	<2	<2	<2	<2	<2	<2	<2
(c)	<2	<2	<2	<2	<2	<2	<2	<2
(d)	<2	<2	<2	<2	<2	<2	<2	<2
(e)	<2	<2	<2	<2	<2	<2	<2	<2
(f)	<2	<2	<2	<2	<2	<2	<2	<2
(g)	<2	<2	<2	<2	<2	<2	<2	<2
(h)	<2	<2	<2	<2	<2	<2	<2	<2
(i)	<2	<2	<2	<2	<2	<2	<2	<2
(j)	<2	<2	<2	<2	<2	<2	<2	<2
(k)	<2	<2	<2	<2	<2	<2	<2	<2
(l)	<2	<2	3	<2	<2	<2	<2	<2
(m)	<2	<2	7	<2	<2	<2	<2	<2
Limit	90	75	60	1000	60	25	60	500

4.3.5.2 (2c) Toys Substrate Materials: Cadmium requirement

Method: ASTM F963-11 Section 8.3 and CPSC-CH-E1004-11

Metallic material

- (a) Joint: silver color metal
- (b) Screws: silver color metal

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STC Test Report

Date : 2016-03-24

Page 6 of 18

No. : HP293569

Sample	Total Cadmium content, µg/sample
(a)	<100
(b)	<100
Limit	-

ppm = mg/kg (milligram per kilogram)

2. USA Consumer Product Safety Improvement Act

2.1 Children's products containing lead - Total lead content in substrate

Ref.: CPSIA Sec 101(a).

Determined by: Inductively Coupled Argon Plasma Atomic Emission Spectrophotometer

Polymeric material

Test method: Standard operation procedure for determining total lead (Pb) in non-metal children's products, CPSC-CH-E1002-08.1

- (a) Ball: red plastic
- (b) Inner part: dull black plastic
- (c) Ball: yellow plastic
- (d) Ball: orange plastic
- (e) Ball: dark blue plastic
- (f) Ball: green plastic
- (g) Ball: purple plastic
- (h) Ball: light blue plastic
- (i) Ball: black plastic
- (j) Ball: white plastic
- (k) Inner part: dull white plastic

Metallic material

Test method: Standard operation procedure for determining total lead (Pb) in metal children's products, CPSC-CH-E1001-08.1

- (l) Joint: silver color metal
- (m) Screws: silver color metal

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STC Test Report

Date : 2016-03-24
No. : HP293569

Page 7 of 18

Sample No.	Total lead content, ppm
(a)	<10
(b)	<10
(c)	<10
(d)	<10
(e)	<10
(f)	<10
(g)	<10
(h)	<10
(i)	<10
(j)	<10
(k)	<10
(l)	<10
(m)	<10
Limit	100

2.2 Phthalates content (in composite condition)

Ref.: CPSIA Sec. 108 & 16 CFR 1307

Test method: CPSC-CH-C1001-09.3 by Gas Chromatography with Mass Selective Detector

- (a) 1. Ball: red plastic
2. Inner part: dull black plastic
3. Ball: yellow plastic
- (b) 1. Ball: orange plastic
2. Ball: dark blue plastic
3. Ball: green plastic
- (c) 1. Ball: purple plastic
2. Ball: light blue plastic
3. Ball: black plastic
- (d) 1. Ball: white plastic
2. Inner part: dull white

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STC Test Report

Date : 2016-03-24

Page 8 of 18

No. : HP293569

Sample No.	Phthalates content, %(w/w)									
	DBP	BBP	DEHP	DNOP	DINP	DIDP	DHEXP	DIBP	DPENP	DCHP
(a)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(b)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(c)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(d)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Limit	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
					See Note 2			See Note 3		

Remark:

- DBP =Di-n-butyl phthalate
- BBP =Benzyl-n-butyl phthalate
- DEHP = Di (2-ethylhexyl) phthalate
- DNOP = Di-n-octyl phthalate
- DINP = Diisononyl phthalate
- DIDP = Diisodecyl phthalate
- DHEXP =Di-n-hexyl phthalate
- DIBP =Diisobutyl phthalate
- DPENP =Di-n-pentyl phthalate
- DCHP =Dicyclohexyl phthalate
- %(w/w) =percentage weight per weight

Note 2: The requirements of DNOP, DINP and DIDP are only applicable to components that can be placed in children's mouths.

Note 3: The test results of DHEXP, DIBP, DPENP and DCHP are included for reference according to the requirements of the proposed rule of 16 CFR 1307.

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STC Test Report

Date : 2016-03-24
No. : HP293569

Page 9 of 18

3. EN71

3.1 EN71-1:2014 - Part 1: Mechanical and physical properties

<u>Applicable Clause</u>	<u>Description</u>	<u>Result</u>
4	<u>General requirements</u>	
4.1	Materials cleanliness	Pass
4.7	Edges	Pass
4.8	Points and metallic wires	Pass
7	<u>Markings and instructions for use</u>	* ²
7.1	General	Pass
7.2	Toys not intended for children under 36 months	Pass

*² = The manufacturer or his authorized representative or the importer into the community shall in a visible, easily legible and indelible form affix his name and/or trade name and/or mark and address on the toy or on its packaging.

3.2 EN71-2:2011+A1:2014 - Part 2: Flammability

<u>Applicable Clause</u>	<u>Description</u>	<u>Result</u>
4.1	General requirements	Pass

3.3 EN71-3 :2013+A1:2014 - Part 3: Migration of certain elements

Test Method: EN71-3: 2013+A1:2014

Determined by: Inductively Coupled Argon Plasma Atomic Emission Spectrophotometer and Inductively Coupled Plasma Mass Spectrometry

Category III: Scraped-off toy material

Polymeric material

- (a) Ball: red plastic
- (b) Inner part: dull black plastic
- (c) Ball: yellow plastic
- (d) Ball: orange plastic
- (e) Ball: dark blue plastic
- (f) Ball: green plastic
- (g) Ball: purple plastic
- (h) Ball: light blue plastic
- (i) Ball: black plastic
- (j) Ball: white plastic
- (k) Inner part: dull white plastic

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STC Test Report

Date : 2016-03-24

Page 10 of 18

No. : HP293569

Metallic material

(l) Joint: silver color metal

(m) Screws: silver color metal

Elements	Result (mg/kg)			Limit(mg/kg)
	a	b	c	
Aluminium	6	ND	ND	70000
Antimony	ND	ND	ND	560
Arsenic	ND	ND	ND	47
Barium	ND	ND	ND	18750
Boron	ND	ND	ND	15000
Cadmium	ND	ND	ND	17
Chromium(III)	ND	ND	ND	460
Chromium (VI)	ND	ND	ND	0.2
Cobalt	ND	ND	ND	130
Copper	ND	ND	ND	7700
Lead	ND	ND	ND	160
Manganese	ND	ND	ND	15000
Mercury	ND	ND	ND	94
Nickel	ND	ND	ND	930
Selenium	ND	ND	ND	460
Strontium	ND	ND	ND	56000
Tin	ND	ND	ND	180000
Organic tin	ND	ND	ND	12
Zinc	ND	ND	ND	46000

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STC Test Report

Date : 2016-03-24

Page 11 of 18

No. : HP293569

Elements	Result (mg/kg)			Limit(mg/kg)
	d	e	f	
Aluminium	ND	ND	ND	70000
Antimony	ND	ND	ND	560
Arsenic	ND	ND	ND	47
Barium	ND	ND	ND	18750
Boron	ND	ND	ND	15000
Cadmium	ND	ND	ND	17
Chromium(III)	ND	0.16	ND	460
Chromium (VI)	ND	ND	ND	0.2
Cobalt	ND	ND	ND	130
Copper	ND	ND	ND	7700
Lead	ND	ND	ND	160
Manganese	ND	ND	ND	15000
Mercury	ND	ND	ND	94
Nickel	ND	ND	ND	930
Selenium	ND	ND	ND	460
Strontium	ND	ND	ND	56000
Tin	ND	ND	1.0	180000
Organic tin	ND	ND	1.0	12
Zinc	ND	ND	ND	46000

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STC Test Report

Date : 2016-03-24

Page 12 of 18

No. : HP293569

Elements	Result (mg/kg)			Limit(mg/kg)
	g	h	i	
Aluminium	ND	6	ND	70000
Antimony	ND	ND	ND	560
Arsenic	ND	ND	ND	47
Barium	ND	ND	ND	18750
Boron	ND	ND	ND	15000
Cadmium	ND	ND	ND	17
Chromium(III)	ND	0.12	ND	460
Chromium (VI)	ND	0.12	ND	0.2
Cobalt	ND	ND	ND	130
Copper	ND	ND	ND	7700
Lead	ND	ND	ND	160
Manganese	ND	ND	ND	15000
Mercury	ND	ND	ND	94
Nickel	ND	ND	ND	930
Selenium	ND	ND	ND	460
Strontium	ND	ND	ND	56000
Tin	ND	ND	ND	180000
Organic tin	ND	ND	ND	12
Zinc	ND	ND	ND	46000

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STC Test Report

Date : 2016-03-24

Page 13 of 18

No. : HP293569

Elements	Result (mg/kg)			Limit(mg/kg)
	j	k	l	
Aluminium	ND	ND	ND	70000
Antimony	ND	ND	ND	560
Arsenic	ND	ND	ND	47
Barium	ND	ND	ND	18750
Boron	ND	ND	ND	15000
Cadmium	ND	ND	ND	17
Chromium(III)	ND	0.12	3.46	460
Chromium (VI)	ND	0.12	ND	0.2
Cobalt	ND	ND	ND	130
Copper	ND	ND	ND	7700
Lead	ND	ND	ND	160
Manganese	ND	ND	13	15000
Mercury	ND	ND	ND	94
Nickel	ND	ND	ND	930
Selenium	ND	ND	ND	460
Strontium	ND	ND	ND	56000
Tin	ND	ND	ND	180000
Organic tin	ND	ND	ND	12
Zinc	ND	69	3837	46000

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STC Test Report

Date : 2016-03-24

Page 14 of 18

No. : HP293569

Elements	Result (mg/kg)	Limit(mg/kg)
	m	
Aluminium	5	70000
Antimony	ND	560
Arsenic	ND	47
Barium	ND	18750
Boron	ND	15000
Cadmium	ND	17
Chromium(III)	7.29	460
Chromium (VI)	ND	0.2
Cobalt	ND	130
Copper	ND	7700
Lead	ND	160
Manganese	25	15000
Mercury	ND	94
Nickel	ND	930
Selenium	ND	460
Strontium	ND	56000
Tin	ND	180000
Organic tin	ND	12
Zinc	9494	46000

Remark: ND = Not detected (see Table A)
mg/kg = milligram per kilogram

The Chromium content was reported as Chromium (III) and Chromium (VI). Whenever the result of Chromium exceeded the limit of Chromium (III) and Chromium (VI), confirmation test was performed.

The Tin content was reported as Organic tin unless specified.

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STC Test Report

Date : 2016-03-24

Page 15 of 18

No. : HP293569

Table A. Detection limit	
Elements	Limit of Detection (mg/kg)
Aluminium	5
Antimony	5
Arsenic	5
Barium	5
Boron	5
Cadmium	2.5
Chromium(III)	0.1
Chromium (VI)	0.1
Cobalt	5
Copper	5
Lead	5
Manganese	5
Mercury	5
Nickel	5
Selenium	5
Strontium	5
Tin	0.2
Organic tin	0.2
Zinc	5

4. Phthalate content (in composite condition)

Ref.: EU Directive 1907/2006(REACH) Annex XVII

Method used: Gas Chromatography Mass Spectrometer

- (a) 1. Ball: red plastic
2. Inner part: dull black plastic
3. Ball: yellow plastic
- (b) 1. Ball: orange plastic
2. Ball: dark blue plastic
3. Ball: green plastic
- (c) 1. Ball: purple plastic
2. Ball: light blue plastic
3. Ball: black plastic
- (d) 1. Ball: white plastic
2. Inner part: dull white

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STC Test Report

Date : 2016-03-24

Page 16 of 18

No. : HP293569

Sample	Phthalates content, %(w/w)					
	DBP	BBP	DEHP	DNOP	DINP	DIDP
(a)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(b)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(c)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
(d)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Limit	The cumulative total of DBP, BBP and DEHP shall not be greater than 0.1% by mass of the plasticised material.			The cumulative total of DNOP, DINP and DIDP shall not be greater than 0.1% by mass of the plasticised material.		

Remark:

- DBP = Di-n-butyl phthalate
- BBP = Benzyl-n-butyl phthalate
- DEHP = Di (2-ethylhexyl) phthalate
- DNOP = Di-n-octyl phthalate
- DINP = Diisononyl phthalate
- DIDP = Diisodecyl phthalate
- %(w/w) = percentage weight per weight
- Method detection limit = 0.01%(w/w)
- The requirements of DNOP, DINP and DIDP are only applicable on tested material which can be placed in the mouth by children.

5. Polycyclic Aromatic Hydrocarbons (PAHs) (in composite condition)

Method used: Ref. to ZEK 01.4-08

Determined by: Gas Chromatography with Mass Selective Detector

- (a) 1. Ball: red plastic
2. Inner part: dull black plastic
3. Ball: yellow plastic
- (b) 1. Ball: orange plastic
2. Ball: dark blue plastic
3. Ball: green plastic
- (c) 1. Ball: purple plastic
2. Ball: light blue plastic
3. Ball: black plastic
- (d) 1. Ball: white plastic
2. Inner part: dull white

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STC Test Report

Date : 2016-03-24

Page 17 of 18

No. : HP293569

Test Item	(a)	(b)	Specification
Polycyclic Aromatic Hydrocarbons (PAHs)			
- Benzo[a]pyrene	Not Detected	Not Detected	<1 mg/kg of any of the listed PAHs
- Benzo[e]pyrene	Not Detected	Not Detected	
- Benzo[a]anthracene	Not Detected	Not Detected	
- Chrysen	Not Detected	Not Detected	
- Benzo[b]fluoranthene	Not Detected	Not Detected	
- Benzo[j]fluoranthene	Not Detected	Not Detected	
- Benzo[k]fluoranthene	Not Detected	Not Detected	
- Dibenzo[a,h]anthracene	Not Detected	Not Detected	

Test Item	(c)	(d)	Specification
Polycyclic Aromatic Hydrocarbons (PAHs)			
- Benzo[a]pyrene	Not Detected	Not Detected	<1 mg/kg of any of the listed PAHs
- Benzo[e]pyrene	Not Detected	Not Detected	
- Benzo[a]anthracene	Not Detected	Not Detected	
- Chrysen	Not Detected	Not Detected	
- Benzo[b]fluoranthene	Not Detected	Not Detected	
- Benzo[j]fluoranthene	Not Detected	Not Detected	
- Benzo[k]fluoranthene	Not Detected	Not Detected	
- Dibenzo[a,h]anthracene	Not Detected	Not Detected	

Notes: mg/kg denotes milligram per kilogram

Method detection limit of each PAH is 0.3 mg/kg

***** End of Test Report *****

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STC Test Report

Date : 2016-03-24
No. : HP293569

Page 18 of 18

Appendix for Photos of the Submitted Sample





STC Test Report

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by The Hong Kong Standards & Testing Centre Limited (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The Company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").
2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. The Report refers only to the sample tested and does not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.
5. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
6. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
7. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
8. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
9. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.
10. Issuance records of the Report are available on the internet at www.stc-group.org. Further enquiry of validity or verification of the Reports should be addressed to the Company.