

Date : 2019-06-27 Page 1 of 22 No. : HMD19060040

**Applicant** : RMS International (USA) Inc.

4 Gill Street, STE A Woburn, MA 01801 United States

**Supplier / Manufacturer :** RMS International (USA) Inc.

4 Gill Street, STE A Woburn, MA 01801 United States

**Description of Sample(s):** Submitted sample(s) said to be

Product: 360 Stunt Car Music and Light Up

Brand Name: N/A

Model No.: US4-0399/MEN FCC ID: 2ATYA49US40399

**Date Samples Received**: 2019-06-21

**Date Tested** : 2019-06-26

**Investigation Requested :** Perform ElectroMagnetic Interference measurement in accordance

with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI

C63.10: 2013 for FCC Certification.

**Conclusions** : The submitted product <u>COMPLIED</u> with the requirements of Federal

Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described

above and on Section 2.2 in this Test Report.

**Remarks**: For additional model(s) details, please see page 3.





Date: 2019-06-27 Page 2 of 22 No. : HMD19060040 **CONTENT:** Cover Page 1 of 22 Content Page 2 of 22 <u>1.0</u> **General Details** 1.1 Equipment Under Test [EUT] Page 3 of 22 Description of EUT operation 1.2 Date of Order Page 3 of 22 Page 3 of 22 1.3 Submitted Sample(s) Page 3 of 22 1.4 **Test Duration** 1.5 Country of Origin Page 3 of 22 <u>2.0</u> **Technical Details** 2.1 Investigations Requested Page 4 of 22 Test Standards and Results Summary 2.2 Page 4 of 22 <u>3.0</u> **Test Results** 3.1 **Emission** Page 5-12 of 22 3.2 Bandwidth Measurement Page 13-15 of 22 Appendix A List of Measurement Equipment Page 16 of 22 Appendix B Duty Cycle Correction During 100 msec Page 17-19 of 22 Appendix C Photograph(s) of Product Page 20-22 of 22



Date : 2019-06-27 Page 3 of 22

No. : HMD19060040

#### 1.0 General Details

### 1.1 Equipment Under Test [EUT]

**Description of Sample(s)** 

Product: 360 Stunt Car Music and Light Up Manufacturer: RMS International (USA) Inc.

4 Gill Street, STE A Woburn, MA 01801 United States

Brand Name: N/A

Model Number: US4-0399/MEN Additional Model Number: SKU#2795363

Rating: 3.0Vd.c. (AA battery\*2)

## 1.1.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Remote control. Operating at 49.86MHz. Test was conducted under Tx mode.

#### 1.2 Date of Order

2019-06-21

#### 1.3 Submitted Sample(s):

1 Sample

#### 1.4 Test Duration

2019-06-26

## 1.5 Country of Origin

China



Date : 2019-06-27 Page 4 of 22 No. : HMD19060040

### **<u>2.0</u>** Technical Details

## 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10: 2013 for FCC Certification. The device was realized by test software.

### 2.2 Test Standards and Results Summary Tables

EMISSION Results Summary								
Test Condition	v							
			Severity	Pass	Failed	N/A		
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.235	ANSI C63.10: 2013	N/A	$\boxtimes$				
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	$\boxtimes$				
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	$\boxtimes$				

Note: N/A - Not Applicable



Date : 2019-06-27 Page 5 of 22 No. : HMD19060040

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

Test Requirement: FCC 47CFR 15.235 Test Method: ANSI C63.10:2013

Test Date: 2019-06-26 Mode of Operation: Tx mode

#### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.



Date : 2019-06-27 Page 6 of 22 No. : HMD19060040

#### **Spectrum Analyzer Setting:**

9KHz – 30MHz (Pk & Av) RBW: 10kHz

VBW: 30kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

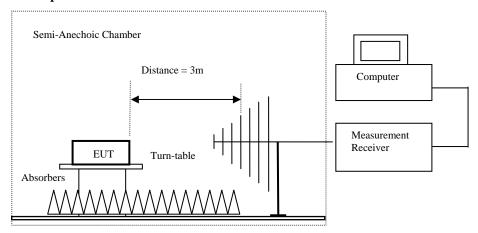
30MHz - 1GHz (QP) RBW: 120kHz

VBW: 120kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

### **Test Setup:**



Ground Plane

- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.



Date : 2019-06-27 Page 7 of 22 No. : HMD19060040

110. : 111/11/17/00/04/0

### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.235]:

Frequency Range of	Field Strength of	Field Strength of
Fundamental	Fundamental Emission	Harmonics Emission
	[Peak]	[Average]
[MHz]	$[\mu V/m]$	$[\mu V/m]$
49.82-49.90	100,000	10,000

#### Results of Tx mode(30MHz-1GHz): PASS

Field Strength of Fundamental Emissions							
	Peak Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field	
	Level @3m	Factor	Strength	Strength		Polarity	
MHz	$dB\mu V$	dB/m	dBμV/m	μV/m	μV/m		
49.86	65.7	9.4	75.1	5,662.4	100,000	Vertical	
49.86	40.5	9.9	50.4	330.8	100,000	Horizontal	

Field Strength of Fundamental Emissions						
			Average			
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	$dB\mu V$	dB/m	dBμV/m	μV/m	μV/m	
49.86	62.4	9.4	71.8	3,877.0	10,000	Vertical
49.86	37.2	9.9	47.1	226.5	10,000	Horizontal

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

#### Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.



Date : 2019-06-27 Page 8 of 22 No. : HMD19060040

### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range	Quasi-Peak Limits
[MHz]	$[\mu V/m]$
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

#### Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: (9kHz-30MHz): 2.0dB

(30MHz -1GHz): 4.9dB (1GHz -6GHz): 4.02dB (6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

Results of TX mode (9kHz - 30MHz): PASS

Emissions detected are more than 20 dB below the limit line(s).



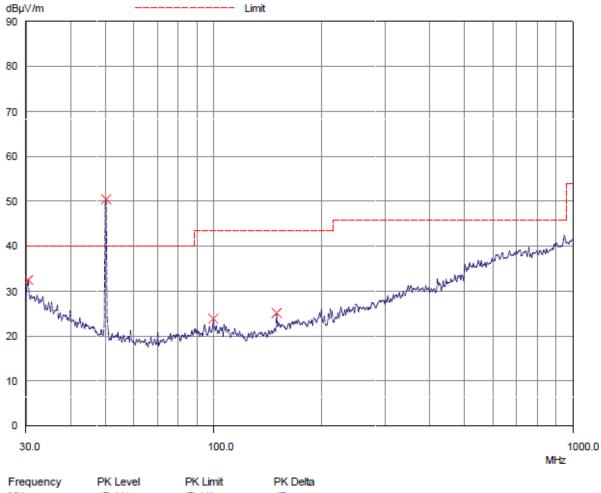
Date : 2019-06-27 Page 9 of 22

No. : HMD19060040

#### Results of TX mode (30MHz - 1GHz): PASS

Please refer to the following table for result details(The data is the worst cases)





Frequency MHz	PK Level dBµ∀/m	PK Limit dBµV/m	PK Delta dB
30.375	32.59	40.00	7.41
49.875	50.39		
99.75	23.94	43.50	19.56
149 625	25 14	43.50	18.36



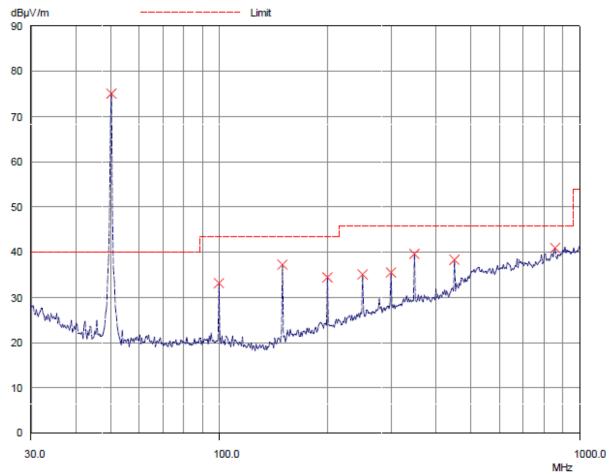
Date: 2019-06-27 Page 10 of 22

No. : HMD19060040

### Results of TX mode (30MHz - 1GHz): PASS

Please refer to the following table for result details(The data is the worst cases)

Vertical



Frequency MHz	QP Level dBμV/m	QP Limit dBµV/m	QP Delta dB
49.875			
99.6875	33.25	43.50	10.25
149.5625	37.26	43.50	6.24
199.4375	34.46	43.50	9.04
249.3125	35.21	46.00	10.79
299.1875	35.60	46.00	10.40
349.0625	39.57	46.00	6.43
448.75	38.46	46.00	7.54
858.0625	40.93	46.00	5.07



Date : 2019-06-27 Page 11 of 22 No. : HMD19060040

3.1.2 Antenna Requirement

**Test Requirements: § 15.203** 

### **Test Specification:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### **Test Results:**

This is Line antenna. The antenna gain =0dBi. User is unable to remove or changed the Antenna.



Date : 2019-06-27 Page 12 of 22 No. : HMD19060040

### 3.2 20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.235

Test Method: ANSI C63.10: 2013 (Section 13.1.7)

Test Date: 2019-06-26 Mode of Operation: Tx mode

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

### **Spectrum Analyzer Setting:**

RBW: 3kHz VBW: 10kHz Sweep: Auto Trace: Max. hold

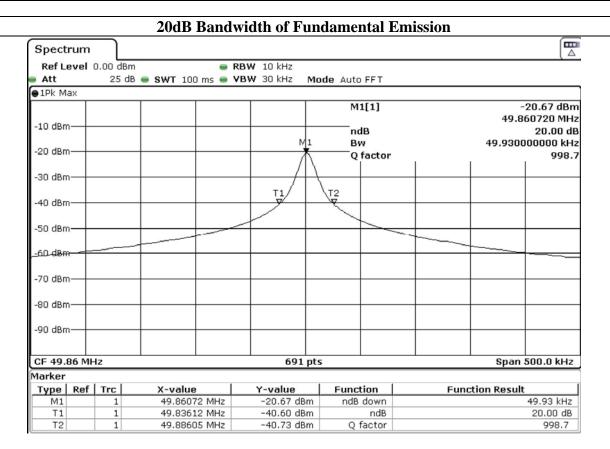
For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



Date : 2019-06-27 Page 13 of 22 No. : HMD19060040

#### Limits for 20dB Bandwidth of Fundamental Emission:

Fl(MHz)	Fh(MHz)	Permitted frequency range(MHz)	Result
49.836	49.886	49.82-49.90	Compliant

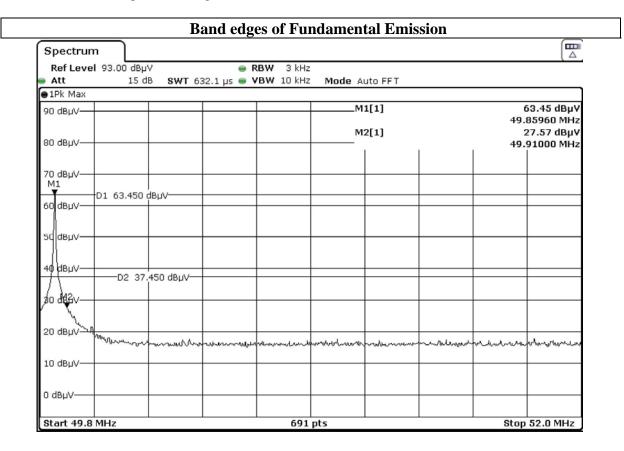




Date : 2019-06-27 Page 14 of 22 No. : HMD19060040

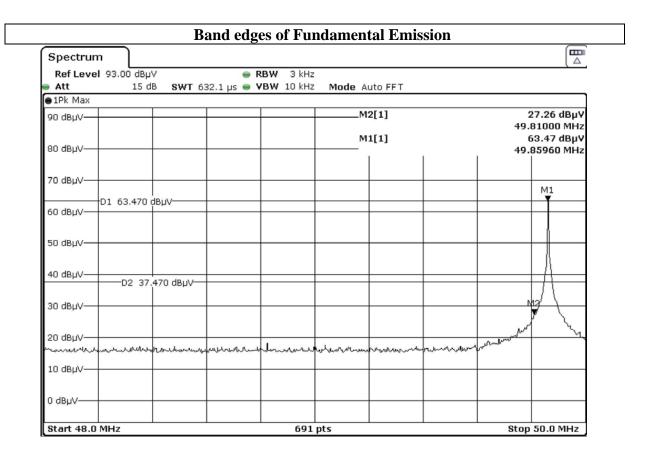
#### Limits for Band edges of Fundamental Emission:

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher emission levels.





Date : 2019-06-27 Page 15 of 22 No. : HMD19060040





Date : 2019-06-27 Page 16 of 22 No. : HMD19060040

### Appendix A

### **List of Measurement Equipment**

#### **Radiated Emission**

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3		2018/04/20	2020/04/20
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2018/05/24	2020/05/24
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2019/06/01	2020/06/01
EM276	BROADBAND HORN ANTENNA	A-INFOMW	JXTXLB- 10180-SF	J203109090300 7	2018/04/27	2020/04/27
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2018/05/13	2020/05/13
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2018/05/13	2020/05/13
EM302	PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ)	SEIBERSDORF LABORATORIES	POD 16	161806/L	2018/05/11	2020/05/11
EM303	PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ)	SEIBERSDORF LABORATORIES	POD 618	6181908/L	2018/05/11	2020/05/11
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2018/04/16	2020/04/16
EM045	POWER METER	ROHDE & SCHWARZ	NRVD	843246/028	2018/06/01	2020/06/01

#### Remarks:-

CM Corrective Maintenance

N/A Not Applicable
TBD To Be Determined



Date : 2019-06-27 Page 17 of 22 No. : HMD19060040

Appendix B

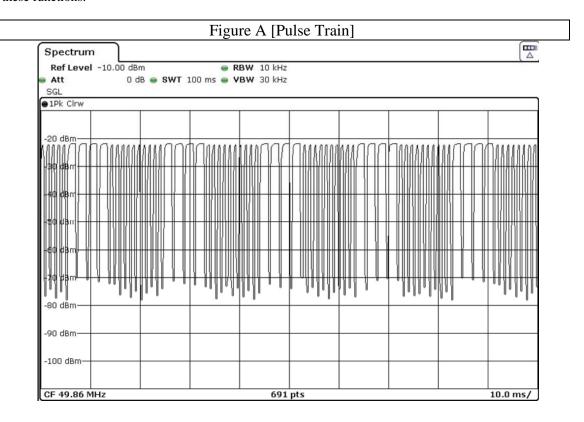
### **Duty Cycle Correction During 100msec**

Each packet period (100msec) never exceeds a series of 20 (1.6957msec) long and 43 (0.6522msec) short pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered (1.6957\*20+0.6522\*53) msec per 100msec = 68.48% duty cycle. Figure A through D shows the characteristics of the pulses train for one of these functions.

#### Remarks:

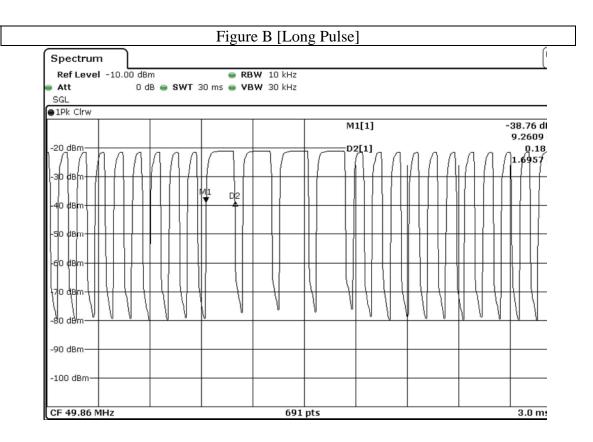
Duty cycle factor = 20Log [(20\*1.6957ms + 53\*0.6522ms)/100] = -3.29dB

The following figures [Figure A to Figure C] showed the characteristics of the pulse train for one of these functions.



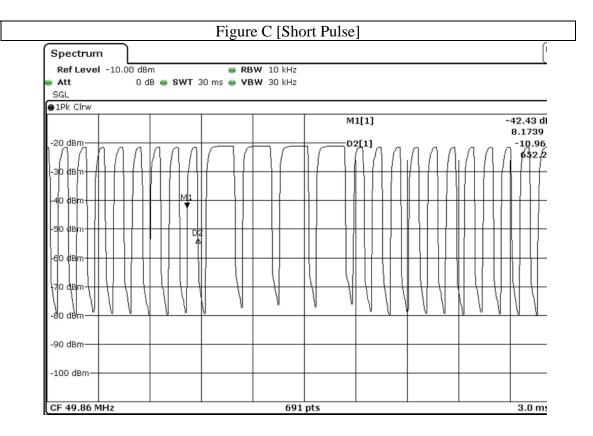


Date : 2019-06-27 Page 18 of 22 No. : HMD19060040





Date : 2019-06-27 Page 19 of 22 No. : HMD19060040





Date : 2019-06-27 Page 20 of 22 No. : HMD19060040

### Appendix C

### Photographs of EUT

Front View of the product



**Inside View of the product** 



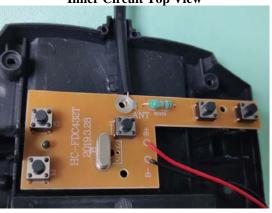
**Inner Circuit Bottom View** 



Rear View of the product



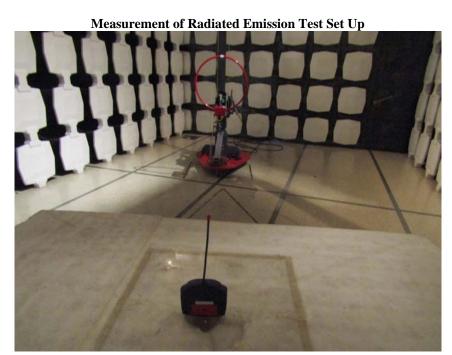
**Inner Circuit Top View** 

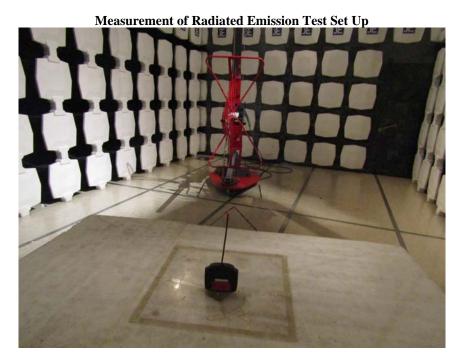




Date : 2019-06-27 Page 21 of 22 No. : HMD19060040

Photographs of EUT





The Hong Kong Standards and Testing Centre Limited
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong



Date : 2019-06-27 Page 22 of 22 No. : HMD19060040

Photographs of EUT

Measurement of Radiated Emission Test Set Up



\*\*\*\*\* End of 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. Subject to clause 3, 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 be at liberty to disclose the testing-related documents and/or files anytime to any third-party accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall attach to the Company's act of disclosure.
- 4. 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.
- 5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.
- 6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.
- 7. 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.
- 8. 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.
- 9. 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.
- 10. 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.
- 11. 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.
- 12. Issuance records of the Report are available on the internet at www.stc.group. Further enquiry of validity or verification of the Reports should be addressed to the Company.