

EMC TEST REPORT

No. 150600399HZH-001

Applicant : Ningbo Riwei Electrical Appliances Co., Ltd.
Manufacturer : Ningbo Riwei Electrical Appliances Co., Ltd.
Industrial Zone, Zhouxiang Town, Cixi, Ningbo,
Zhejiang 315324, P. R. China
Product Name : Callus Remover
Type/Model : RS590
TEST RESULT : PASS

SUMMARY

The equipment complies with the requirements according to the following standards:

EN 55014-1:2006/+A1:2009/+A2:2011: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission

EN 55014-2:1997/+A1:2001/+A2:2008: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity- Product family standard

Date of issue: July 21, 2015

Prepared by:



Reggie Yuan (*Project engineer*)

Approved by:



Lco Ye (*Reviewer*)

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1. GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product Name : Callus Remover

Description of EUT : The product covered in this report is callus remover for household use. After technical evaluation, we tested it and the worst test data is listed in the report as representative.

Model number : RS590

Rating : DC 3V

Mains lead : None

Data cable : None

EUT type : ☒ Table top
☐ Floor standing

☐ EUT is toy, defined as : ☐ Category A
☐ Category B
☐ Category C
☐ Category D
☐ Category E

Sample received date : June 15, 2015

Sample Identification No. : 1150609-12-001

Date of test : June 15, 2015-July 15, 2015



1.2 Description of Client

Applicant :

Person of contact : Xu Qiying

Telephone : 86 574 63326571

Telefax : 86 574 63326571

Manufacturer : Ningbo Riwei Electrical Appliances Co., Ltd.
Industrial Zone, Zhouxiang Town, Cixi, Ningbo,
Zhejiang 315324, P. R. China

1.3 Description of Test Facility

Name Intertek Testing Services Hangzhou Limited

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Telephone 86 571 28997803

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Subcontractor :

☒ Name TOSHIBA INFORMATION EQUIPMENT
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2. TEST SPECIFICATIONS

2.1 Standards

EN 55014-1:2006/+A1:2009/+A2:2011: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission

EN 55014-2:1997/+A1:2001/+A2:2008: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard

2.2 Mode of operation during the test / Test peripherals used

2.2.1 Description of operation

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency. Other voltage and frequency is specified if used.

2.2.2 Test Peripherals

Equipment description (Including Brand name)	Model & Serial	Cable description (List Length, Type & Purpose)
-	-	-

2.3 Instrument list

Selected	Instrument	EH no.	Model	Valid until date
<input checked="" type="checkbox"/>	ESD generator	EH 1330	KES4021	2016-6-17
<input checked="" type="checkbox"/>	Therom-Hygrograph	EH 1091	ZJ1-2A	2016-6-24
<input checked="" type="checkbox"/>	Tonometer	EH 1423	YM3	2016-5-21
<input checked="" type="checkbox"/>	Shielded room 2	EH 1183	GB88	2016-1-4
<input checked="" type="checkbox"/>	EMI test receiver	100057	ESU26	2016-7-27
<input checked="" type="checkbox"/>	Pre-AMP	2944A11088	8447D	2015-12-16
<input checked="" type="checkbox"/>	broadband antenna	9168-294	VULB9168	2015-9-16

2.4 Test Summary

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TEST ITEM	RESULT	NOTE
Mains terminal continuous disturbance voltage *	NA	
Mains terminal discontinuous disturbance voltage/click	NA	
Continuous disturbance power*	NA	
Radiated emission	Pass	Tested in Toshiba
Harmonics	NA	
Voltage fluctuation-Flicker	NA	
Electrostatic Discharge (ESD)	Pass	
Electric Fast Transient /Burst (EFT/B)	NA	
Radiated field susceptibility	NA	
Surge	NA	
Injected current	NA	
Voltage dips and interruption	NA	

Notes:

1. NA =Not Applicable
2. Margin to the limit is within the uncertainty interval of the measured value.
3. *: According to clause 7.1.4 of the standard EN55014-1, a test at 160 kHz (conducted emission) and at 50 MHz (disturbance power) was made over a range of 0,9 to 1,1 times the rated voltage, and the worst test data is listed in the relevant clause of the report.

Emission Test

3. Mains/Load/Control Terminal Continuous Disturbance Voltage

Test result: NA

4. Continuous Disturbance Power

Test result: NA

5. Mains Terminal Discontinuous Disturbance Voltage

Test result: NA

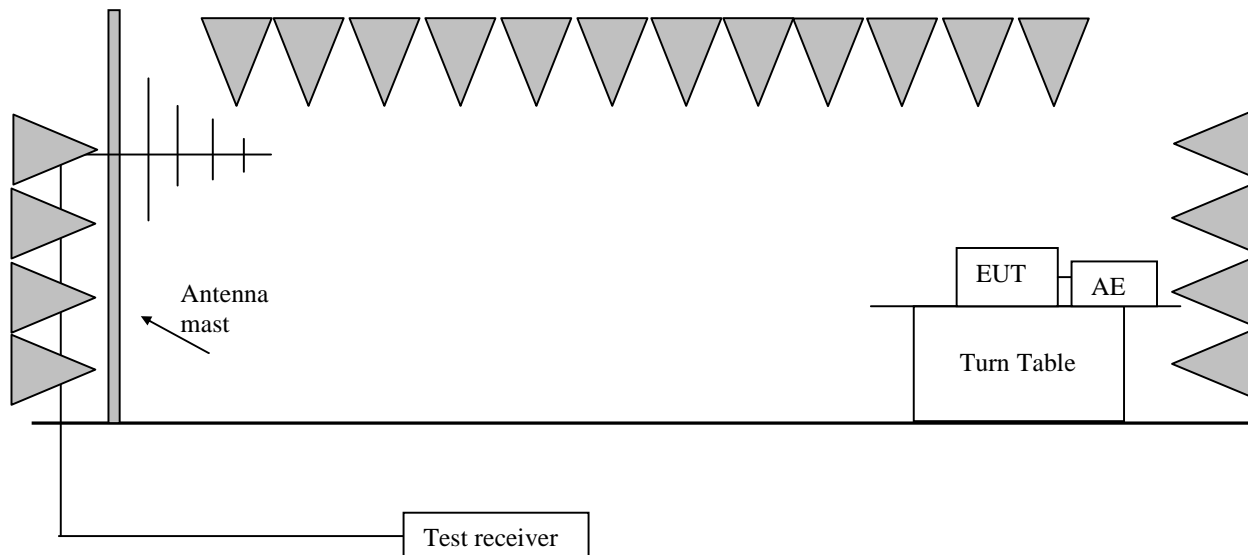
6. Radiated emission

Test result: PASS

6.1 Radiated emission limit from frequency range 30MHz – 1000MHz

Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 3m	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 10m
30-230	40	30
230-1000	47	37
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.		

6.2 Block diagram and test set up

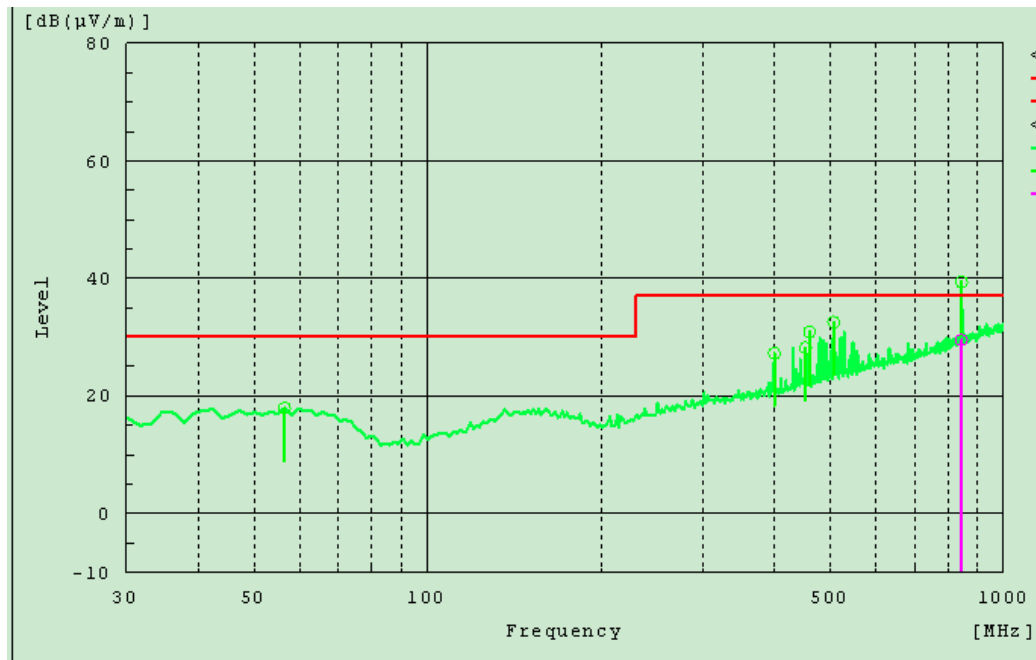


The measurement was applied in a semi-anechoic chamber.
Measurement was performed according to CISPR 22.
Setting of EUT is according to clause 7 of EN 55014-1.
The bandwidth setting on Test Receiver was 120kHz.
The frequency range from 30MHz to 1000MHz was checked.

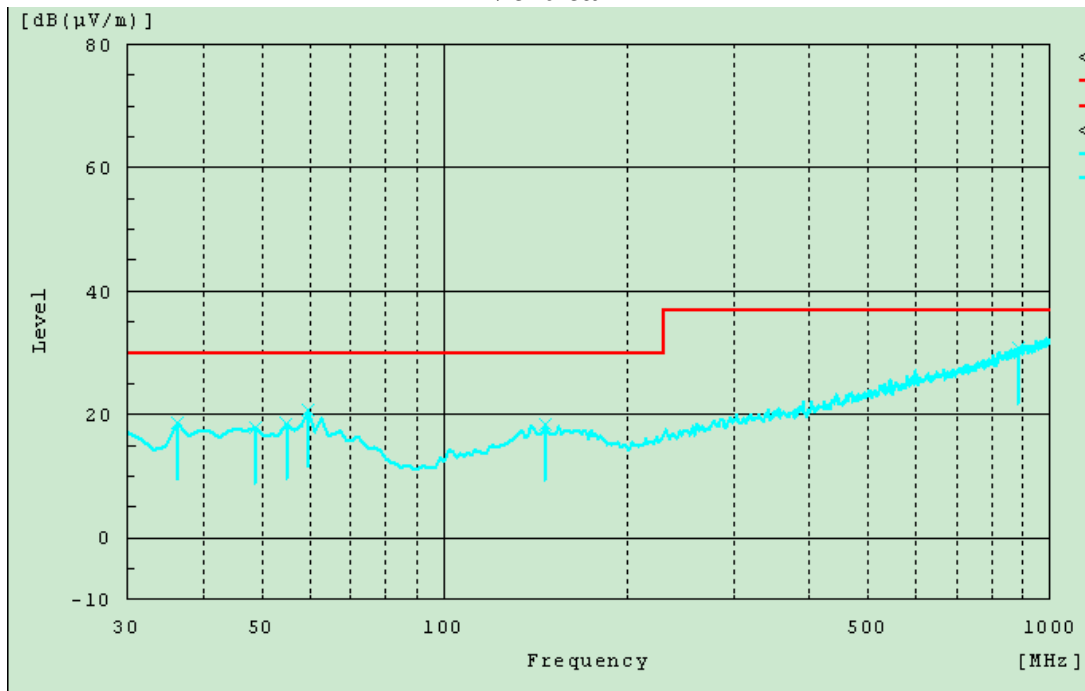
6.3 Test Protocol and Wave Form

Temperature: 24°C
Relative humidity: 42%

Horizontal



Vertical



--- Horizontal Polarization (QP) ---						
No.	Frequency [MHz]	Reading [dB (μV)]	c.f [dB (1/m)]	Result [dB (μV/m)]	Limit [dB (μV/m)]	Margin [dB]
1	844.804	31.2	-1.7	29.5	37.0	7.5

--- Vertical Polarization ---						
No.	Frequency [MHz]	Reading [dB (μV)]	c.f [dB (1/m)]	Result PK [dB (μV/m)]	Limit QP [dB (μV/m)]	Margin QP [dB]
1	36.218	35.0	-16.3	18.7	30.0	11.3
2	48.654	31.4	-13.5	17.9	30.0	12.1
3	54.872	32.0	-13.5	18.5	30.0	11.5
4	59.535	34.4	-13.6	20.8	30.0	9.2
5	146.587	32.1	-13.7	18.4	30.0	11.6
6	884.968	31.8	-1.0	30.8	37.0	6.2

6.4 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty of radiated emission is: $\pm 4.90\text{dB}$ (30MHz-1000MHz).

The measurement uncertainty is given with a confidence of 95%, $k=2$.

7. Harmonics

Test result: NA

8. Voltage Fluctuations-Flicker

Test result: NA

Immunity Test

Performance criteria

The performance criteria are based on the general criteria of the standard and derived from the product specification

Criterion A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Basic EMC standard for immunity test

IEC 61000-4-2:1995/+A1:1998/+A2:2000: Electromagnetic Compatibility (EMC) – Part 4- 2: testing and measurement techniques – electrostatic discharge immunity test

IEC 61000-4-3:2006/+A1:2007: Electromagnetic Compatibility (EMC) – Part 4- 3: testing and measurement techniques – radiated, radio frequency, electromagnetic field immunity test

IEC 61000-4-4:2004: Electromagnetic Compatibility (EMC) – Part 4- 4: testing and measurement techniques – electric fast transient/burst immunity test

IEC 61000-4-5:2005: Electromagnetic Compatibility (EMC) – Part 4- 5: testing and measurement techniques – section 5: surge immunity test

IEC 61000-4-6:2003/+A1:2004/+A2:2006: Electromagnetic Compatibility (EMC) – Part 4- 6: testing and measurement techniques – section 6: immunity to conducted disturbance, induced by radio frequency field

IEC 61000-4-11:2004: Electromagnetic Compatibility (EMC) – Part 4- 11: testing and measurement techniques – section 11: voltage dips, short interruption and voltage variations immunity test

Categories of apparatus

☐ Category II (Shall fulfill the tests: ESD, EFT, Inject current, Surge, Dips)

☒ Category III (Shall fulfill the tests: ESD, EM fields*)

☐ Category IV (Shall fulfill the tests: ESD, EFT, Inject current, Surge, Dips, EM fields)

Note: *only applicable to the ride on toys operating with electronic devices.

9. Electrostatic Discharge (ESD)

Test result: **PASS**

9.1 Severity Level and Performance Criterion

9.1.1 Test level

1a – Contact discharge		1b – Air discharge	
Level	Test voltage kV	Level	Test voltage kV
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
X	Special	X	Special
Notes: 1. “X” is an open level. The level has to be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed. 2. The gray rows were the selected test level.			

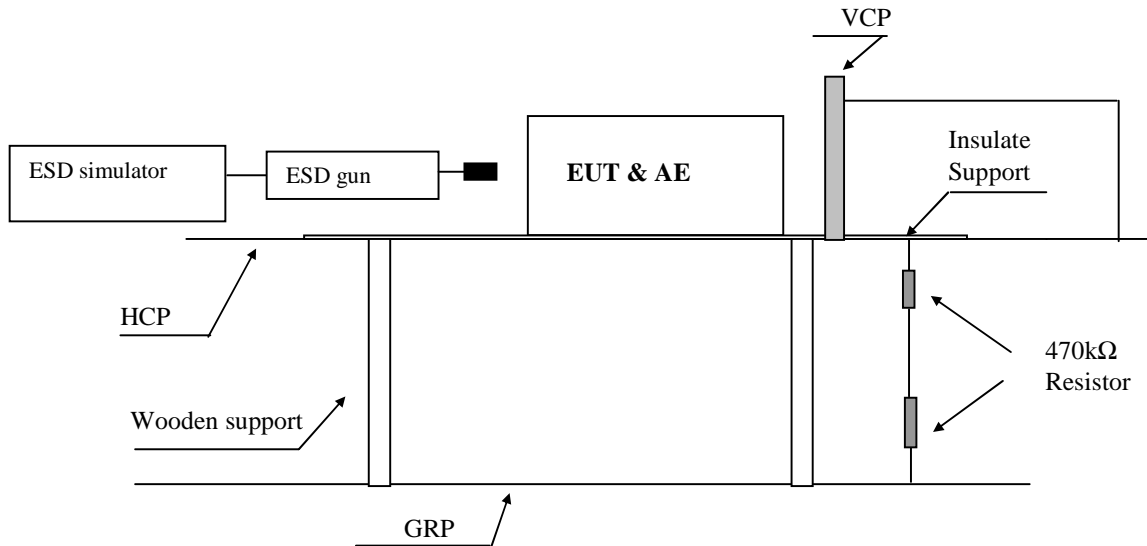
9.1.2 Performance Criterion

Performance criterion: **C** (Only applied to toys not using score or data entered by the user)

Performance criterion: **B** (Others)

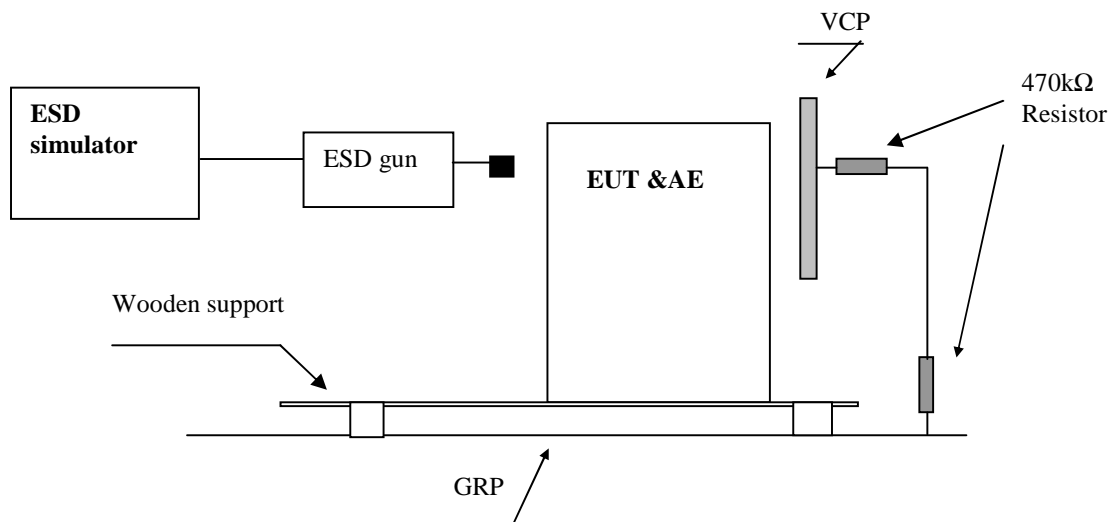
9.2 Block Diagram of Test Setup

☒ For table-top equipment



Note: HCP means Horizontal Coupling Plane
VCP means Vertical Coupling Plane
GRP means Ground Reference Plane
Wooden support is a 0.8m height table

☐ For floor standing equipment



Note: VCP means Vertical Coupling Plane
GRP means Ground Reference Plane
Wooden support is a 0.1m height rack

9.3 Test Setup and Test Procedure

Measurement was performed in shielded room.

Measurement and setting of EUT was applied according to clause 7 of IEC 61000-4-2.

The test method and equipment was specified by IEC 61000-4-2 with the modifications by clause 5.1 of EN 55014-2.

9.4 Test Protocol

Temperature : 22°C
Relative Humidity: 43%
Air Pressure : 101kPa

Direct discharges were applied at the following selected points:

Test point #	Test level [kV]	Air/Contact	Polarity (+/-)	Pass/Fail	Comment
A	2/4	Contact	+/-	Pass	All touchable screws of enclosure
B	2/4	Contact	+/-	Pass	Accessible metal parts of the EUT
C	2/4/8	Air	+/-	Pass	Air gap of the switch, button
D	2/4/8	Air	+/-	Pass	The air in-taking opening
E	2/4/8	Air	+/-	Pass	Slots around the EUT

Indirect contact discharges were applied to the VCP and the HCP at the following selected points:

☒ For table top equipment

Point	Description	Point	Result
HCP f	0,1m from the front of the EUT	Edge of centre,corner on HCP	Pass
HCP b	0,1m from the back of the EUT	Edge of centre,corner on HCP	Pass
HCP r	0,1m from the right side of the EUT	Edge of centre,corner on HCP	Pass
HCP l	0,1m from the left side of the EUT	Edge of centre,corner on HCP	Pass
VCP f	0,1m from the front of the EUT	Edge of centre,corner on VCP	Pass
VCP b	0,1m from the back of the EUT	Edge of centre,corner on VCP	Pass
VCP r	0,1m from the right of the EUT	Edge of centre,corner on VCP	Pass
VCP l	0,1m from the left of the EUT	Edge of centre,corner on VCP	Pass

☐ For floor standing equipment

Point	Description	Point	Result
VCP f	0,1m from the front of the EUT	Edge of centre,corner on VCP	-
VCP b	0,1m from the back of the EUT	Edge of centre,corner on VCP	-
VCP r	0,1m from the right of the EUT	Edge of centre,corner on VCP	-
VCP l	0,1m from the left of the EUT	Edge of centre,corner on VCP	-

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT met the requirements of Performance A

9.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty of ESD test is: $\pm 6.65\%$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

9.6 Additions, Deviations and Exclusions from Standards

None.

10. Electromagnetic field susceptibility

Test result: NA

11. Electric Fast Transient/Burst Immunity Test

Test result: NA

12. Surge Immunity Test

Test result: NA

13. Immunity to Conducted Disturbances, Induced by Radio-frequency Fields

Test result: NA

14. Voltage Dips, Short Interruptions and Voltage Variations Immunity Test

Test result: NA

Appendix I: Photograph of equipment under test



