



Project: 11014506B
Date: November 6, 2015
Model: 240V_WWF13NW

Test Report

On

Appliance EMF Testing

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Test Report Details

Tests Performed By: **UL LLC**
333Pfungsten Rd.
Northbrook, IL 60062

Tests Performed For: **Warm Waves L L C**
Address: **222 Wisconsin Ave., Suite 203**
Lake Forest, IL. 60045

Applicant Contact: **Tom Driscoll**
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Test Report Date: **November 6, 2015**

Product Type: **Warming Mat, under tile floors**

Model Number: **240V_WWF13NW**

Sample Serial Number: **n/a: prototype**

EUT Category: **Heating Appliance**

Testing Start Date: **November 2, 2015**

Date Testing Complete: **November 2, 2015**

UL LLC reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. UL LLC shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL LLC issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, A2LA, or any agency of the US government.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
-			

1.0 GENERAL - Product Description

The EUT is warming mat that is installed under tile floors for warming purposes.

1.1 Device Configuration During Test

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Appliance	Warm Waves L L C	240V_WWF13NW	None

- Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

1.1.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	-	-	None
1	Mains	AC	<3m	None	None

*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
 I/O = Signal Input or Output Port (Not Involved in Process Control)
 PMC = Process Measurement and Control Port

1.1.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
<108MHz	Highest internal operating frequency

1.1.4 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	240	-	-	AC-60	1	Split-Phase

1.2 EUT Operation Modes:

Mode #	Description
1	EUT was energized and tested while <i>rising to operating</i> temperature.
2	EUT was energized and tested once <i>steady-state operating temperature has been reached</i> .

1.3 EUT Configuration Modes:

Mode #	Description
1	EUT was tested using the operating condition of a blanket according to table A.1 <i>without insulating material</i> .
2	EUT was tested using the operating condition of a blanket according to table A.1 <i>with insulating material – cement board</i> .

“The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report”

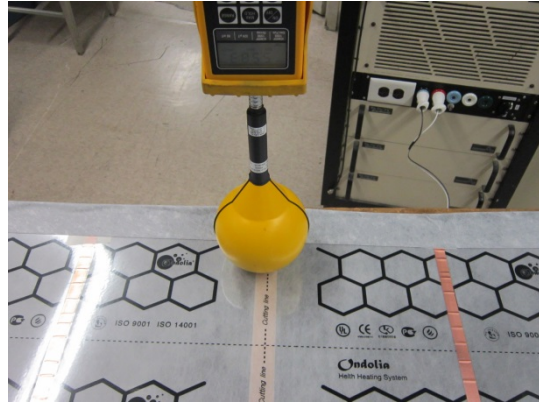
1.4 Setup Photo:

The photo below illustrates the configuration of the equipment above and was found to be the worst case location.

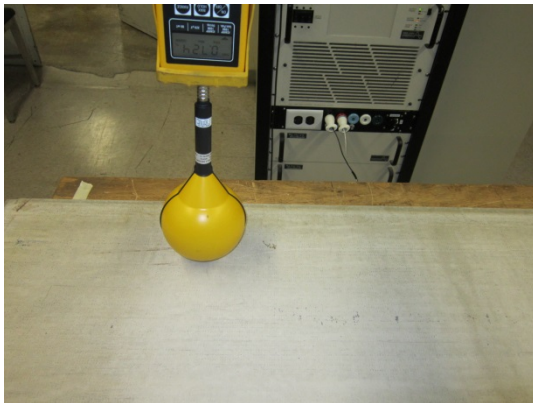
13 Watts/square foot model: no insulation



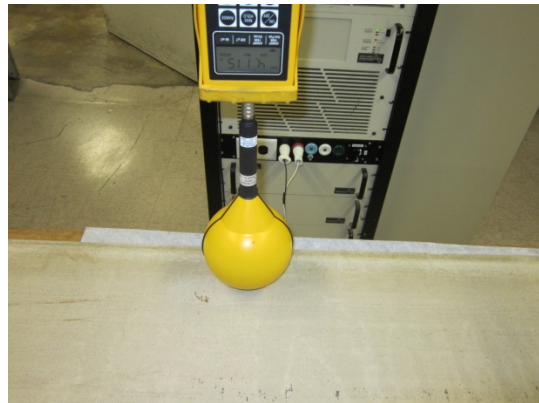
56 Watts/square foot model: no insulation



13 Watts/square foot model: with insulation



56 Watts/square foot model: with insulation



1.5 Deviations from standard test methods.

- Not Applicable
- As described below: EUT was configured and tested as a Heating Blanket per table A.1, see section 1.3.

1.6 Device Modifications Necessary for Compliance

- Not Applicable.
- As described below:

1.7 Test Summary

Test Name Test Requirement/Specification	Comply	Does Not Comply	See Remark
Electromagnetic Fields EN62233: 2008; Replaces: EN50366:2003+A1:2006	Yes	-	-

Remarks:

- 1) No Modifications required for compliance.
- 2) Modifications required to comply as described in Section 1.6

2.0 Conclusion:

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL LLC in accordance with the procedures stated in each test requirement and specification. The test list was determined by the Applicant as being applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has

met the technical requirements as defined under section 5.0

not met the technical requirements as defined under section

Test Start Date: November 2, 2015

Test Completion Date: November 2, 2015

Best regards,

Reviewed by:



Luis Miramontes (Ext.41218)
Engineer
Consumer Technology Division
Verification Services



Bartlomiej Mucha(Ext.41216)
Staff Engineer
Consumer Technology Division
Verification Services

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 TEST REGULATIONS

The emissions tests were performed according to following regulations:

----- International -----

EN 62233: 2008	Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure
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5.0 Electromagnetic Fields

5.1.1 EMF Test Procedure

Measurements were made in the general laboratory. Tests for maximum EMF were made on top of the product.

5.1.2 EMF Setup - 13 Watts/square foot model

1 fully configured sample was scanned over the following frequency range:

B-fields:	0.879		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	While Heating to temperature
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>Without</u> insulated layer on top of EUT				

1 fully configured sample was scanned over the following frequency range:

B-fields:	0.724		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	While Heating to temperature
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>With</u> insulated layer on top of EUT				

1 fully configured sample was scanned over the following frequency range:

B-fields:	0.909		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	Heated to steady-state
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>Without</u> insulated layer on top of EUT				

1 fully configured sample was scanned over the following frequency range:

B-fields:	0.693		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	Heated to steady-state
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>With</u> insulated layer on top of EUT				

*See Power Interface and EUT Operating Modes for details

** Determined from Appendix A of EN62233.

5.2 EMF Results - 13 Watts/square foot model

Laboratory Environmental Conditions at time of test.			
Temperature:	24 °C	Humidity:	39 %RH

	Percent
Maximum Measured Value Mode: 1, Configuration: 1	0.879
Measurement Location: AC conductor side of sample, see photo in section 1.4	
	Percent
Maximum Measured Value Mode: 1, Configuration: 2	0.724
Measurement Location: AC conductor side of sample, see photo in section 1.4	
	Percent
Maximum Measured Value Mode: 2, Configuration: 1	0.909
Measurement Location: AC conductor side of sample, see photo in section 1.4	
	Percent
Maximum Measured Value Mode: 2, Configuration: 2	0.693
Measurement Location: AC conductor side of sample, see photo in section 1.4	

W = (Coupling Factor) x (Measured Percentage) x (1/100)

	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 1, Configuration: 1	<u>.001670</u>	<u>1</u>
	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 1, Configuration: 2	<u>.001376</u>	<u>1</u>
	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 2, Configuration: 1	<u>.001727</u>	<u>1</u>
	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 2, Configuration: 2	<u>.001317</u>	<u>1</u>

The results of this test [**complied**] [~~did not comply~~] with the requirements.

5.1.1 EMF Setup - 56 Watts/square foot model

1 fully configured sample was scanned over the following frequency range:

B-fields:	5.583		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	While Heating to temperature
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>Without</u> insulated layer on top of EUT				

1 fully configured sample was scanned over the following frequency range:

B-fields:	4.115		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	While Heating to temperature
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>With</u> insulated layer on top of EUT				

1 fully configured sample was scanned over the following frequency range:

B-fields:	5.176		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	Heated to steady-state
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>Without</u> insulated layer on top of EUT				

1 fully configured sample was scanned over the following frequency range:

B-fields:	3.829		Mode*	
			Power	Operation
Frequency Range	10Hz to 400kHz	Detector RMS, Filter 10Hz	240VAC 60Hz	Heated to steady-state
Test Distance (cm)**	0			
Coupling Factor**	0.19			
Note: <u>With</u> insulated layer on top of EUT				

*See Power Interface and EUT Operating Modes for details

** Determined from Appendix A of EN62233.

5.3 EMF Results - 56 Watts/square foot model

Laboratory Environmental Conditions at time of test.			
Temperature:	24 °C	Humidity:	39 %RH

	Percent
Maximum Measured Value Mode: 1, Configuration: 1	5.583
Measurement Location: AC conductor side of sample, see photo in section 1.4	
	Percent
Maximum Measured Value Mode: 1, Configuration: 2	4.115
Measurement Location: AC conductor side of sample, see photo in section 1.4	
	Percent
Maximum Measured Value Mode: 2, Configuration: 1	5.176
Measurement Location: AC conductor side of sample, see photo in section 1.4	
	Percent
Maximum Measured Value Mode: 2, Configuration: 2	3.829
Measurement Location: AC conductor side of sample, see photo in section 1.4	

W = (Coupling Factor) x (Measured Percentage) x (1/100)

	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 1, Configuration: 1	<u>.0101608</u>	<u>1</u>
	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 1, Configuration: 2	<u>.007819</u>	<u>1</u>
	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 2, Configuration: 1	<u>.009834</u>	<u>1</u>
	<u>Weighted Result (W)</u>	<u>Limit</u>
Maximum Weighted Result Mode: 2, Configuration: 2	<u>.007275</u>	<u>1</u>

The results of this test [**complied**] [~~did not comply~~] with the requirements.

Test Equipment Information						
Description	Function/Range	Manufacturer	Model	Identifier	Last Cal. Date	Next Cal. Date
EMF Meter	RMS / 10Hz / %	NARDA	ELT400	EMC4268	04-22-2015	04-30-2016
Temp/RH Meter	RH / °C	Extech	SD700	EMC4367	02-27-2015	02-27-2016

Appendix A

Accreditations and Authorizations



NVLAP Lab code: 100414-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, EN 55022:1998, AS/NZS 1044, CNS 13438:1997, ANSI C63.4, FCC Method - 47 CFR Part 15, FCC Method -47 CFR Part 68, AS/NZS 3548, IEC 61000-3-2, EN 61000-3-2, CISPR 14-1, EN 55014-1, AS/NZS 1044, CNS 13783-1, CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, and IEC 61000-4-11 testing.



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 91040).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6. U.S. Identifier Number: US0113