Test Report

Curtis-Straus LLC, *a wholly owned subsidiary of BV CPS*

Report No	EN3211-1
Client	Thermo Fisher Scientific Portable Analytical Inst. Mike Dugas
Address	2 Radcliff Road Tewksbury, MA 01876
Phone Fax	+1 978-215-1330 +1 978-670-7430
Items tested	XL2
Standards	47 CFR 15.225
Test Dates	November 19, December 3, and 4, 2013
Results	As detailed within this report
Prepared by	 Ami Soni – Test Engineer
Authorized by	 Mairaj Hussain – EMC Supervisor
Issue Date	12/20/13
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 22 of this report.

Content

Content 2

Regulatory Information 3

Summary 4

Frequency Range Investigated 4

EUT Configuration 5

Test Data 8

AC Mains Conducted Emissions 8

Test Data 8

AC Mains Setup Pictures 9

15.225 10

Emissions Mask 10

Spurious Emissions (10KHz – 140MHz) 11

Emissions Setup Pictures 15

Frequency Stability 16

Limit 16

FCC Required labeling for Verified Devices 47 CFR Part 15.19 18

Declaration of Conformity (DoC): 18

FCC Required Instruction Manual Inserts 19

Canadian Labeling /Manual Requirements 20

User Manual Notice for Licence-Exempt Radio Apparatus 20

Model Number and IC 20

Conditions Of Testing 22

Regulatory Information

FRN number	0020963492
FCC ID	Z4HXL2

Summary

The EUT is a radio device that is part of Thermo's XL2 unit. It is a multi-protocol RFID read/write module for use with most industry standard 13.56MHz RFID tags and smart labels.

This test report supports an application for certification pursuant to 47 CFR 15.225 for the RFID read/write module portion of this device. Testing was performed according to procedures outlined in ANCI c63.4.

Emissions were maximized by rotating the device 360°, varying the test antenna height.

EUT antenna could not be maximized because EUT has an on board fixed antenna. Device was also tested in 3 orthogonal axes.

The radio contained in the product is very low powered. The signal from the radio could not be measured at a 3m distance. The field strength reading from the radio was taken at a 10cm distance and was measured against 3m field strength limit.

The product was tested with newly charged batteries and while on charge using an AC-DC adapter.

AC mains conducted emissions were performed using a 50Ω/5µH LISN.

Frequency Range Investigated

150 KHz – 30MHz AC mains conducted missions (RBW 9 KHz, VBW 30 KHz)

9 KHz – 30MHz Radiated emissions (RBW 9 KHz, VBW 30 KHz)

30 KHz – 140MHz Radiated emissions (RBW 120 KHz, VBW 1 MHz)

All readings are peak unless otherwise specified.

EUT Configuration

EUT Configuration

Work Order: N2669
Company: Thermo Fisher Scientific Portable Analytical Ins.
Company Address: 2 Radcliff Road
Tewksbury, MA 01876
Contact: John Kretsch
Person Present: Richard Carey

		MN	SN
EUT Description:	Hand held XRF material identifier	XL2	Sample 1
Autec Power Adapter:		A2-36SG12R-V	A2-36SG12-V-A17A
EUT Max Frequency:	400MHz		
EUT Min Frequency:	0.032768MHz		
EUT TX Frequency:	13.56MHz		

Support Equipment:	**MN**	**SN**
None		

EUT Ports:

Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Comment
AC (adapter input)	AC power	1	1*	3-wire AC	No	Yes	2m	2m	In	*Unpopulated during Battery mode
Serial (RS232)	serial	1	1	DB9	Yes	None	2m	2m	In	Only for set up
Stereo port	Audio	1	1	N/A	Yes	N/A	2m	2m	In	Not used in this config
USB	USB	1	1	USB	Yes	None	1m	3m	In	Not used in this config

Software / Operating Mode Description:

EUT is set to transmit RFID radio at 13.56MHz.

Compliance Statement

Part 15		Compliant (Yes) / (No) / (NA)
15.225(a)	The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.	Yes
15.225(b)	Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.	Yes
15.225(c)	Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.	Yes
15.225(d)	The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.	Yes
15.225(e)	The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.	Yes
15.225(f)	In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.	[1]NA
15.15(b)	There are no controls accessible to the user that varies the output power above specified limits.	Yes
15.19	The label is shown in the label exhibit.	Yes
15.21	Information to the user is shown in the instruction manual.	Yes

15.27	No special accessories are required for compliance.	Yes
15.31	The EUT was tested in accordance with the measurement standards in this section.	Yes
15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.	Yes
15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.	Yes
15.203	EUT employs an integral antenna.	Yes
15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.	Yes
15.207	EUT meets the AC Line conducted emissions requirements of	Yes

[1]EUT is not a radio frequency powered tag.

Test Data

AC Mains Conducted Emissions

Test Method

Per ANSI c63.4 (2009)

Test Data

AC Conducted Emissions Data Table

Date: 16-Dec-13 **Company:** Thermo Fisher **Work Order:** N3211
Engineer: Arik Zwirner **EUT Desc:** XL2
Temp: 21.0 ºC **Humidity:** 25% **Pressure:** 1006 mBar
Notes: Autec Power Systems supply, model A2-36SG12R-V
Frequency Range: 0.15-30MHz **EUT Input Voltage/Frequency:** 120Vac/60Hz

Frequency (MHz)	Quasi-Peak Readings QP1 (dBµV)	QP2 (dBµV)	Average Readings AVG1 (dBµV)	AVG2 (dBµV)	LISN Factors L1 (dB)	L2 (dB)	Cable Factor (dB)	ATTN Factor (dB)	FCC/CISPR Class B QP Limit (dBµV)	Margin (dB)	Result (Pass/Fail)	FCC/CISPR Class B AVG Limit (dBµV)	Margin (dB)	Result (Pass/Fail)
0.16	21.0	19.6	0.5	0.1	-0.1	-0.1	-0.1	-19.8	65.5	-24.5	Pass	55.5	-35.0	Pass
0.44	27.1	24.5	13.3	10.2	0.0	-0.1	-0.1	-19.8	57.0	-10.1	Pass	47.0	-13.9	Pass
0.55	17.7	14.5	7.5	3.9	0.0	-0.1	-0.1	-19.8	56.0	-18.4	Pass	46.0	-18.6	Pass
1.13	13.3	12.7	8.4	7.0	0.0	-0.1	-0.1	-19.8	56.0	-22.8	Pass	46.0	-17.7	Pass
6.20	14.8	15.0	8.3	7.3	0.0	-0.1	-0.2	-19.8	60.0	-25.0	Pass	50.0	-21.8	Pass
13.56	29.0	27.0	28.9	26.8	-0.1	-0.1	-0.2	-19.8	60.0	-10.9	Pass	50.0	-1.0	Pass
27.12	8.1	6.4	5.2	2.5	-0.1	-0.2	-0.3	-19.8	60.0	-31.7	Pass	50.0	-24.6	Pass

Result: Pass ***Worst Margin:*** -1.0 dB ***Frequency:*** 13.560 MHz

Measurement Device: LISN ASSET 1726(Line 1) LISN ASSET 1727(Line 2) **Cable:** CEMI-10 **Spectrum Analyzer:** SA EMI Chamber (132
Attenuator: 20dB Attenuator-73 **Site:** CEMI 3

Rev. 12/11/2013

Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
SA EMI Chamber (1327)	9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	5/30/2014	5/30/2013
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 1726	150kHz-30MHz	LI-150A	Com-Power	201092	1726	I	1/11/2014	1/11/2013
LISN Asset 1727	150kHz-30MHz	LI-150A	Com-Power	201093	1727	I	1/2/2014	1/2/2013
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 3	719150		A-0015			III	NA	N/A
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	I	5/29/2014	5/29/2013
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-10	9kHz - 2GHz		C-S			II	5/9/2014	5/9/2013
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-73	9kHz-2GHz			N/A		II	10/12/2014	10/12/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

AC Mains Setup Pictures

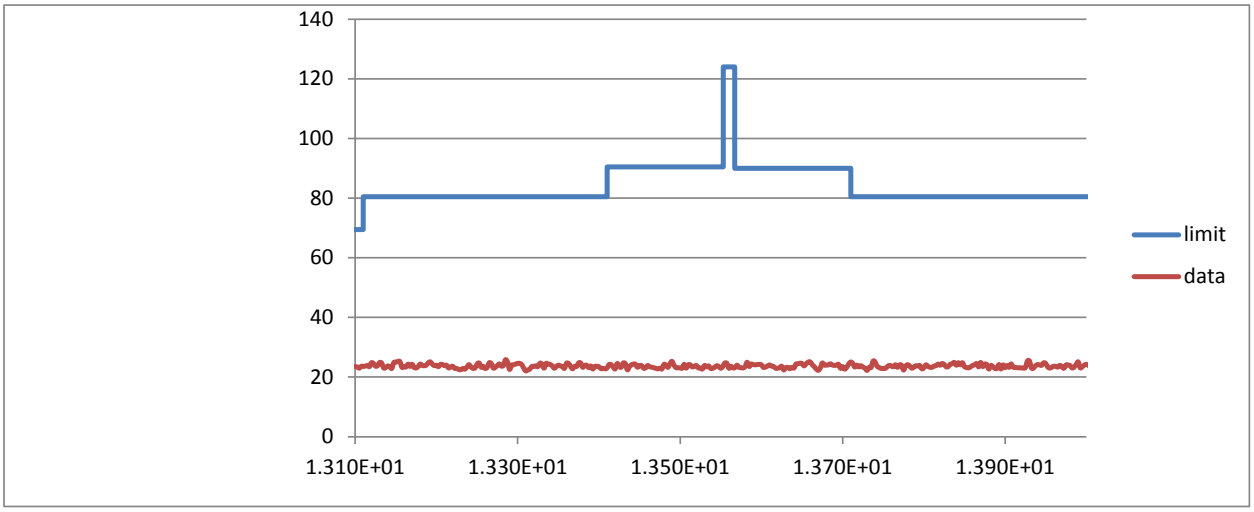
See exhibit for test setup pictures.

15.225

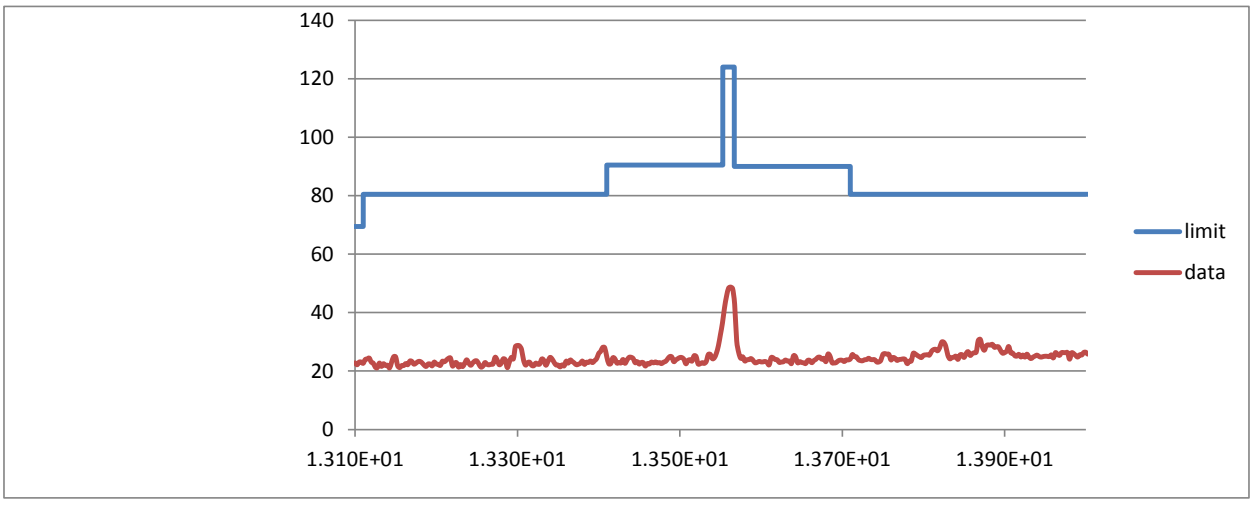
Test Method

Per ANSI C63.10 & C63.4

Emissions Mask



At 3m distance no emission was detected.



Reading at 10cm compared against the limits at 3m.

Data on the graph is adjusted for antenna, cable, pre amp, and distance factors.

Spurious Emissions (10KHz – 140MHz)

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Chris Reynolds **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 7.4V Battery
Temp: 24.5°C **Humidity:** 23% **Pressure:** 1002mBar
Frequency Range: 0.009-5MHz **Measurement Distance:** 3 m
Notes: EUT in battery mode

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--			FCC 15.225		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No Emissions Found within -20dB of the limit			---	---	---	---	---	---	---	---	---	---

Table Result: --- by --- dB ***Worst Freq:*** --- MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red **Antenna:** Lg Loop **Preselector:** ---

Note: Preamp removed for the 9-10kHz range

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Chris Reynolds **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 120VAC, 60Hz
Temp: 24.5°C **Humidity:** 23% **Pressure:** 1002mBar
Frequency Range: 0.009-5MHz **Measurement Distance:** 3 m
Notes: EUT in charging mode

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--			FCC 15.225		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No Emissions Found within -20dB of the limit			---	---	---	---	---	---	---	---	---	---

Table Result: --- by --- dB ***Worst Freq:*** --- MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red **Antenna:** Lg Loop **Preselector:** ---

Rev. 11/23/2013

Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental SA #2	9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	12/8/2013	12/8/2012
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**		**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	2/16/2014	2/16/2012
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red	0.009-2000MHz	ZFL-1000-LN	CS	N/A	798	II	2/2/2014	2/2/2013
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Large Loop	20Hz-5MHz	6511	EMCO	9704-1154	67	I	4/27/2014	4/27/2012
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/20/2014	3/20/2013
TH A#1832		35519-044	Control Company	130318277	1832	II	6/13/2015	6/13/2013
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1781	9kHz - 18GHz		Florida RF			II	3/6/2014	3/6/2013
Asset #1785	9kHz - 18GHz		Florida RF			II	3/14/2014	3/14/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Chris Reynolds **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 7.4V Battery
Temp: 24.5°C **Humidity:** 23% **Pressure:** 1002mBar
Frequency Range: 5-30MHz **Measurement Distance:** 3 m
Notes: EUT in battery mode

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--			FCC 15.225		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No Emissions found within -20dB of the limit			---	---	---	---	---	---	---	---	---	---

Table Result: --- by --- dB ***Worst Freq:*** --- MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red **Antenna:** Sm Loop (high) **Preselector:** ---

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Chris Reynolds **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 120VAC, 60Hz
Temp: 24.5°C **Humidity:** 23% **Pressure:** 1002mBar
Frequency Range: 5-30MHz **Measurement Distance:** 3 m
Notes: EUT in charging mode

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--			FCC 15.225		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No Emissions found within -20dB of the limit			---	---	---	---	---	---	---	---	---	---

Table Result: --- by --- dB ***Worst Freq:*** --- MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red **Antenna:** Sm Loop (high) **Preselector:** ---

Rev. 11/23/2013

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental SA #2	9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	12/8/2013	12/8/2012

Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	2/16/2014	2/16/2012

Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red	0.009-2000MHz	ZFL-1000-LN	CS	N/A	798	II	2/2/2014	2/2/2013

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	4/27/2014	4/27/2012

Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/20/2014	3/20/2013
TH A#1832		35519-044	Control Company	130318277	1832	II	6/13/2015	6/13/2013

Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #1781	9kHz - 18GHz	Florida RF	II	3/6/2014	3/6/2013
Asset #1785	9kHz - 18GHz	Florida RF	II	3/14/2014	3/14/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Nirak So **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 7.4V Battery
Temp: 25.8°C **Humidity:** 22% **Pressure:** 1003mBar
Frequency Range: 30 to 1000MHz **Measurement Distance:** 3 m
Notes: EUT in battery mode **EUT Max Freq:** 400MHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
v	207.81	45.0	25.2	11.3	1.0	32.1				43.5	-11.4	Pass
h	209.45	46.0	25.2	11.2	1.0	33.0				43.5	-10.5	Pass
h	249.3	44.6	25.1	12.2	1.1	32.8				46.0	-13.2	Pass
v	266.6	45.5	25.1	13.3	1.4	35.1				46.0	-10.9	Pass
h	266.6	51.1	25.1	13.3	1.4	40.7				46.0	-5.3	Pass
v	346.75	40.0	25.1	14.9	1.4	31.2				46.0	-14.8	Pass
v	533.3	40.8	25.5	18.5	1.7	35.5				46.0	-10.5	Pass
h	533.3	47.2	25.5	18.5	1.7	41.9				46.0	-4.1	Pass
h	801.0	36.0	25.0	21.8	1.9	34.7				46.0	-11.3	Pass
v	1000.0	35.8	24.5	23.9	2.2	37.4				54.0	-16.6	Pass

Table Result: Pass by -4.1 dB ***Worst Freq:*** 533.3 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red **Antenna:** Red-White **Preselector:** ---

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Chris Reynolds **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 120VAC,60Hz
Temp: 24.5°C **Humidity:** 23% **Pressure:** 1002mBar
Frequency Range: 30-1000MHz **Measurement Distance:** 3 m
Notes: EUT in charging mode **EUT Max Freq:** 400MHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
v	45.0	33.9	25.5	11.1	0.5	20.0	---	---	---	40.0	-20.0	Pass
h	79.95	43.9	25.4	8.6	0.7	27.8	---	---	---	40.0	-12.2	Pass
v	208.25	37.2	25.2	11.3	1.0	24.3	---	---	---	43.5	-19.2	Pass
h	267.5	50.3	25.1	13.4	1.4	40.0	---	---	---	46.0	-6.0	Pass
h	400.0	35.0	25.4	16.1	1.5	27.2	---	---	---	46.0	-18.8	Pass
h	533.3	48.0	25.5	18.5	1.7	42.7	---	---	---	46.0	-3.3	Pass
v	833.0	35.1	25.2	22.3	2.0	34.2	---	---	---	46.0	-11.8	Pass
v	1000.0	35.5	24.5	23.9	2.2	37.1	---	---	---	54.0	-16.9	Pass

Table Result: Pass by -3.3 dB ***Worst Freq:*** 533.3 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red **Antenna:** Red-White **Preselector:** ---

Rev. 11/23/2013

Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental SA #2	9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	12/8/2013	12/8/2012
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**		**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	2/16/2014	2/16/2012
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red	0.009-2000MHz	ZFL-1000-LN	CS	N/A	798	II	2/2/2014	2/2/2013
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-White Bilog	30-2000MHz	JB1	Sunol	A091604-1	1105	I	7/24/2015	7/24/2013
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/20/2014	3/20/2013
TH A#1832		35519-044	Control Company	130318277	1832	II	6/13/2015	6/13/2013
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1781	9kHz - 18GHz		Florida RF			II	3/6/2014	3/6/2013
Asset #1785	9kHz - 18GHz		Florida RF			II	3/14/2014	3/14/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.

A2LA ACCREDITED Cert. No. 1627-01

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Nirak So **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 7.4V Battery
Temp: 25.8°C **Humidity:** 22% **Pressure:** 1003mBar
Frequency Range: 1 to 2GHz **Measurement Distance:** 3 m
Notes: EUT in battery mode **EUT Max Freq:** 400MHz

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
v	1000.0	35.5	26.4	19.9	24.7	2.2	42.5	33.4	74.0	-31.5	Pass	54.0	-20.6	Pass
h	1000.0	34.3	26.0	19.9	24.7	2.2	41.3	33.0	74.0	-32.7	Pass	54.0	-21.0	Pass
h	1025.0	31.0	23.5	19.8	25.0	2.3	38.5	31.0	74.0	-35.5	Pass	54.0	-23.0	Pass
v	1067.5	29.0	24.0	19.7	25.5	2.3	37.1	32.1	74.0	-36.9	Pass	54.0	-21.9	Pass
h	1067.5	30.0	24.0	19.7	25.5	2.3	38.1	32.1	74.0	-35.9	Pass	54.0	-21.9	Pass
v	1100.0	30.0	23.7	19.6	25.9	2.2	38.5	32.2	74.0	-35.5	Pass	54.0	-21.8	Pass
v	1295.0	28.0	23.2	18.9	26.1	2.4	37.6	32.8	74.0	-36.4	Pass	54.0	-21.2	Pass
v	1400.0	36.0	28.7	18.7	25.9	2.7	45.9	38.6	74.0	-28.1	Pass	54.0	-15.4	Pass
h	1400.0	33.55	25.8	18.7	25.9	2.7	43.5	35.7	74.0	-30.5	Pass	54.0	-18.3	Pass

Table Result: Pass by -15.4 dB ***Worst Freq:*** 1400.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Brown **Antenna:** Black Horn **Preselector:** ---

Radiated Emissions Table

Date: 03-Dec-13 **Company:** Thermo Fisher Scientific Portable Analytical Inst. **Work Order:** N3211
Engineer: Nirak So **EUT Desc:** XL2 **EUT Operating Voltage/Frequency:** 120VAC,60Hz
Temp: 25.8°C **Humidity:** 22% **Pressure:** 1003mBar
Frequency Range: 1 to 2GHz **Measurement Distance:** 3 m
Notes: EUT in charging mode **EUT Max Freq:** 400MHz

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
v	1000.0	35.0	25.6	19.9	24.7	2.2	42.0	32.6	74.0	-32.0	Pass	54.0	-21.4	Pass
h	1000.0	31.0	24.6	19.9	24.7	2.2	38.0	31.6	74.0	-36.0	Pass	54.0	-22.4	Pass
v	1066.5	29.0	24.8	19.7	25.5	2.3	37.1	32.9	74.0	-36.9	Pass	54.0	-21.1	Pass
h	1082.5	29.0	23.3	19.6	25.7	2.2	37.3	31.6	74.0	-36.7	Pass	54.0	-22.4	Pass
h	1100.0	30.0	22.3	19.6	25.9	2.2	38.5	30.8	74.0	-35.5	Pass	54.0	-23.2	Pass
v	1295.0	30.0	22.0	18.9	26.1	2.4	39.6	31.6	74.0	-34.4	Pass	54.0	-22.4	Pass
v	1400.0	35.0	28.7	18.7	25.9	2.7	44.9	38.6	74.0	-29.1	Pass	54.0	-15.4	Pass
h	1400.0	34.5	25.0	18.7	25.9	2.7	44.4	34.9	74.0	-29.6	Pass	54.0	-19.1	Pass
v	1500.0	30.0	25.0	18.2	26.0	2.9	40.7	35.7	74.0	-33.3	Pass	54.0	-18.3	Pass
v	1600.0	29.0	24.0	18.0	26.3	3.0	40.3	35.3	74.0	-33.7	Pass	54.0	-18.7	Pass

Table Result: Pass by -15.4 dB ***Worst Freq:*** 1400.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1781 **Cable 2:** Asset #1785 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Brown **Antenna:** Black Horn **Preselector:** ---

Rev. 11/23/2013

Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental SA #2	9kHz-26.5 GHz	E7405A	Agilent	MY45104194	rental	I	12/8/2013	12/8/2012
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**		**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	>1GHz		I	5/17/2015	5/17/2013
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red	0.009-2000MHz	ZFL-1000-LN	CS	N/A	798	II	2/2/2014	2/2/2013
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Black Horn	1-18GHz	3115	EMCO	9703-5148	56	I	8/5/2015	8/5/2013
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/20/2014	3/20/2013
TH A#1832		35519-044	Control Company	130318277	1832	II	6/13/2015	6/13/2013
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1781	9kHz - 18GHz		Florida RF			II	3/6/2014	3/6/2013
Asset #1785	9kHz - 18GHz		Florida RF			II	3/14/2014	3/14/2013

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Emissions Setup Pictures

See exhibit for test set up pictures.

Frequency Stability

Limit

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Frequency Stability

Date:	4-Dec-13	Company:	Thermo Fisher Scientific Portable Analytical Ins.	Work Order:	N3211
Engineer:	Tuyen Truong	EUT Desc:	XL2	EUT Operating Voltage:	7.4Vdc
Temp:	20°C	Humidity:	28%	Pressure:	1010mBar

Note: EUT Battery Voltage is rated at 7.4Vdc and primary supply voltage is rated at 120Vac, 60Hz.

Temperature (°C)	Voltage	Measured Frequency (MHz)	Delta (MHz)	Tolerance ±0.01% (MHz)	Margin (MHz)	Pass/Fail
Initial Reading						
20	7.4Vdc	13.562500				
Temperature Variation						
-20	7.4Vdc	13.562500	0.000000	±0.001356	±0.001356	Pass
50	7.4Vdc	13.562500	0.000000	±0.001356	±0.001356	Pass
Initial Reading						
20	120Vac	13.562500				
Voltage Variation						
20	102Vac	13.562500	0.000000	±0.001356	±0.001356	Pass
20	138Vac	13.562500	0.000000	±0.001356	±0.001356	Pass

Chamber: Environmental (Safety) Antenna: Small loop (high)
Cable: 1784 SA: 1327

Rev. 11/23/2013

Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
SA EMI Chamber (1327)	9kHz-13.2 GHz	E4405B	Agilent	MY45103416	1327	I	5/30/2014	5/30/2013
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Green	0.009-2000MHz	ZFL-1000-LN	CS	N/A	802	II	9/24/2014	9/24/2013
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
TH A#1828		35519-044	Control Company	130318292	1828	II	6/13/2015	6/13/2013
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1784	9kHz - 18GHz		Florida RF			II	3/14/2014	3/14/2013
Chambers and Stripline		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Environmental (Safety)		SGTH-31S	B-M-A Inc.	2245	321	I	12/19/2013	11/19/2012
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	4/27/2014	4/27/2012

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Required Equipment Authorization for Device Type

Type of Device	Equipment Authorization Required
TV broadcast receiver	Verification
FM broadcast receiver	Verification
CB receiver	Declaration of Conformity or Certification
Superregenerative receiver	Declaration of Conformity or Certification
Scanning receiver	Certification
Radar detector	Certification
All other receivers subject to part 15	Declaration of Conformity or Certification
TV interface device	Declaration of Conformity or Certification
Cable system terminal device	Declaration of Conformity
Stand-alone cable input selector switch	Verification
Class B personal computers and peripherals	Declaration of Conformity or Certification
CPU boards and internal power supplies used with Class B personal computers	Declaration of Conformity or Certification
Class B personal computers assembled using authorized CPU boards or power supplies	Declaration of Conformity
Class B external switching power supplies	Verification
Other Class B digital devices & peripherals	Verification
Class A digital devices, peripherals & external switching power supplies	Verification
Access Broadband over Power Line (Access BPL)	Certification
All other devices	Verification

FCC Required labeling for Verified Devices 47 CFR Part 15.19

The specific labeling requirements for a device subject to the Verification or Certification procedure are contained in Section 15.19(a). These labelling requirements are:

- One of three compliance statements specified in Section 15.19(a);
- If the device is subject only to Verification include a label bearing a unique identifier - Section 2.954;
- If the device is subject to Certification (1) Section 2.925 contains information on identification of the equipment; (2) include a label bearing an FCC Identifier (FCC ID) - Section 2.926.

If the labeling area for the device is so small, and / or it is not practical to place the required statement on the device, then the statement can be placed in the user manual or product packaging - Section 15.19(a)(5). Generally, devices smaller than the palm of the hand are considered small. However, the device must still be labeled with the unique identifier (Verification) or the FCC ID (Certification).

Declaration of Conformity (DoC):

The labeling requirements for a device subject to the Declaration of Conformity (DoC) procedure are specified in Section 15.19(b). The label should include the FCC logo along with the Trade Name and Model Number, which satisfies the unique identifier requirement of Section 2.1074 if it represents the identical equipment tested for DoC compliance. For personal computers assembled from authorized components, the following additional text must also be included: “Assembled from tested components,” “Complete system not tested.” When the device is so small and / or when it is not practical to place the required additional text on the device, the text may be placed in the user manual or pamphlet supplied to the user. However, the FCC logo, Trade Name, and Model Number must still be displayed on the device - Section 15.19(b)(3).

Part 15 Declaration of Conformity (DoC) Label Examples

FCC Required Instruction Manual Inserts

In most cases, the manual will require one of the following statements due to the associated digital circuitry in the device (unrelated to the RF circuitry):

"*This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:*

-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help."

"This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

Canadian Labeling /Manual Requirements

User manuals for transmitters shall display the following notice in a conspicuous location:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

The above notice may be affixed to the device instead of displayed in the user manual.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each.

User Manual Notice for Licence-Exempt Radio Apparatus

User manuals for licence-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Model Number and IC

The model number is assigned by the applicant and shall be unique to each model of radio apparatus under that applicant's responsibility. The model number shall be displayed on the label preceded by the text: "Model:", so it appears as follows:

Model: model number assigned by applicant

The certification number is made up of a Company Number (CN) assigned by Industry Canada's

Certification and Engineering Bureau followed by the Unique Product Number (UPN), assigned by the applicant. The certification number shall appear as follows:

IC: XXXXXX-YYYYYYYYYYY
where:

- XXXXXX-YYYYYYYYYYY is the certification number;
- XXXXXX is the Company Number (CN) assigned by Industry Canada, made of at most 6 alphanumeric characters (A-Z, 0-9), including a letter at the end of the CN to distinguish between different company addresses;
- YYYYYYYYYYY is the Unique Product Number (UPN) assigned by the applicant, made of at most 11 alphanumeric characters (A-Z, 0-9); and

the letters "IC" (Industry Canada) are to indicate the Industry Canada certification number, but are not part of the certification number.
Permitted alphanumerical characters used in the CN and UPN are limited to capital letters (A-Z) and numerals (0-9). **Example:** A company has been assigned a CN of "21A" and wishes to use a UPN of "WILAN3" for one of its products. The full Industry Canada certification number of this product would thus be: IC: 21A-WILAN3.

All Canadian user manual statements must also include a French version as well.

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must

submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.