



Assessment Report

Title:

Variations to IECEx SIR 17.0004X Iss 0 and Sira 17ATEX4362X Iss 0 (Panel PC, Display, or Box PC – AEx-xxxxxx)

Applicant:

Aplex Technology Inc.

Report No. (Free Ref. No.):

R70193277A

ExTR No.:

GB/SIR/ExTR19.0011/00

Date and place of issue:

February 2019

Sira Certification, Unit 6, Hawarden Industrial Park, Hawarden, Deeside, CH5 3US, United Kingdom

1 Report Summary

1.1 Certification Overview

This report is to introduce a variation to certificate numbers: IECEX SIR 17.0004X (Iss. 0) and Sira 17ATEX4362X (Iss. 0) to assess the following modifications:

1. Addition of some components to mainboards and small converting boards.
2. Addition of 3 LCD panel sources.
3. Controlled documents revision.
4. Updating certification code of BOX PC.

The marking was amended to recognise the certification codes for the Display and Panel PC series and the Box PC series.

Details are described in section 3.

1.2 Applicant's Name & Address (unchanged)

Aplex Technology Inc (head office)
15F-1, No. 186, Jian Yi Road, Zhonghe Dist., New Taipei City, 235 Taiwan, R.O.C.

1.3 Manufacturer's Name & Address (unchanged)

Aplex Technology Inc
2F., No.249, Jian 1st Rd., Zhonghe Dist., New Taipei City
23553, Taiwan, R.O.C.

1.4 Product Name/Model Number (unchanged)

Equipment name: Panel PC, Display, or Box PC
Model number: AEx-xxxxxx

See section 1.7 for details of equipment name/model number breakdown.

1.5 Assessment Standards (unchanged)

The standards are unchanged but are reproduced below for reference.

IECEX	ATEX
IEC 60079-0:2011 Ed. 6	EN 60079-0:2012/A11:2013
IEC 60079-11:2011 Ed. 6	EN 60079-11:2012
IEC 60079-15:2010 Ed. 4	EN 60079-15:2010



The requirements of the equivalent ATEX and IECEX standards are similar; therefore, any references in the following report can be regarded as referring to either format unless stated otherwise.

This report may be issued against standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation. Sira's flexible scope is available on request.

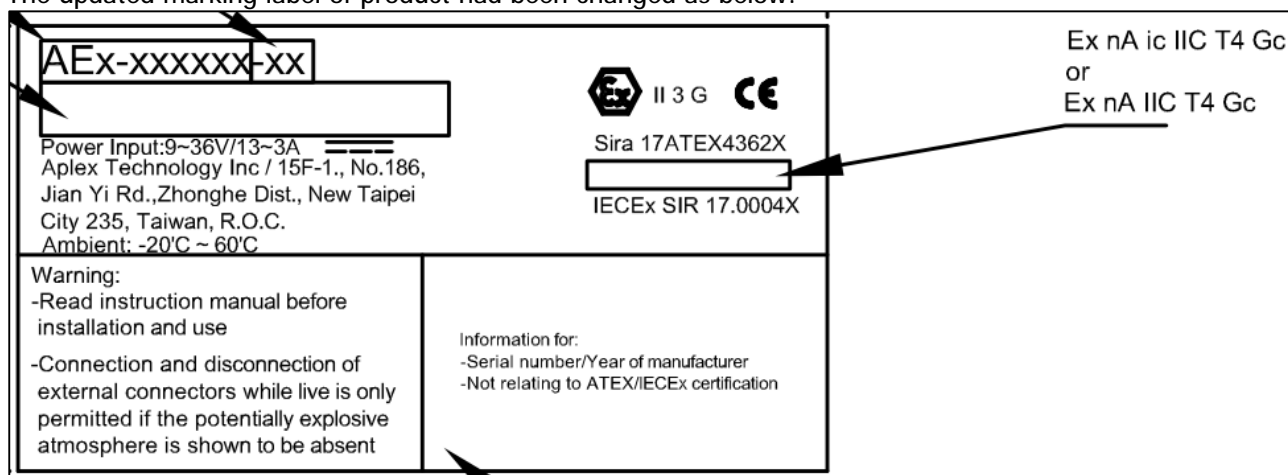
1.6 Marking

The marking had been changed that there was only one certification code: 'Ex nA ic IIC T4 Gc' for all series, it is separated into 2 certification codes in this variation: one for Display and Panel PC series, one for Box PC series, see below. The change of marking does not involve technical change as described in section 3.8



Detail	IECEX	ATEX
Certificate number:	IECEX SIR 17.0004X	Sira 17ATEX4362X
Additional ATEX marking:	--	  II 3G
Certification codes:	Display and Panel PC series : Ex nA ic IIC T4 Gc Box PC series : Ex nA IIC T4 Gc	
Ambient range:	Ta = -20°C to +60°C	

The updated marking label of product had been changed as below:



1.7 Product Description (unchanged)

The product description is unchanged but reproduced below for reference:

The AEx-series is a fanless, panel-mounted or stand-alone device for data collection and processing, with a touchscreen display (except model AEx-2410 or AEx-2411). It is housed in a stainless steel enclosure. It has facilities for connection to suitably-certified external devices.

The product is divided into 3 model series: Display, Panel PC, and Box PC

		Equipment Name / Model Number			
		Display	Panel PC		Box PC
		AEx-1xxPx	AEx-8xxPx	AEx-9xxAPx	AEx-241x
Panel specification	15 inch	AEx-115P	AEx-815P	AEx-915AP	--
	15 inch, high brightness	AEx-115PH	AEx-815PH	AEx-915APH	--
	15.6 inch	AEx-116P	AEx-816P	AEx-916AP	--
	19 inch	AEx-119P	AEx-819P	AEx-919AP	--
	19 inch, high brightness	AEx-119PH	AEx-819PH	AEx-919APH	--
	21.5 inch	AEx-121P	AEx-821P	AEx-921AP	--
	No display	--	--	--	AEx-2410, AEx-2411
		TB-6029	SBC-7111	SBC-7114	SBC-7111 or SBC-7114
		Mainboard P/N			

All models are rated 9-36Vdc, 13-3A, 90W maximum.

1.8 Manufacturer's Documents

The modifications assessed in this report are detailed in the drawings listed below. All drawings apply to both IECEx and ATEX certificates.

No.	Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
01	SBC-7111	1 to 91	3.20	18 Feb 19	Mainboard (P/N SBC-7111) schematic
02	SBC-7114	1 to 95	2.2	18 Feb 19	Mainboard (P/N SBC-7114) schematic
03	TB-547	1 to 2	1.20	18 Feb 19	Connector convert board (between TB-555 and mainboard)
04	TB-548	1 to 1	V1.1	18 Feb 19	Connector convert board (between TB-555 and mainboard)
05	TB-555	9 of 12	V1.2	18 Feb 19	Ex ic USB board
06	AEx CCL	1 to 4	02	18 Feb 19	Critical Component List
07	070000005016	1 to 1	1.0	18 Feb 19	Label drawings
08	TB-6029	1 to 8	F	18 Feb 19	Display board (P/N TB-6029) schematic
09	011481610301	1 to 1	2	18 Feb 19	15.6 inch PANEL FRAME
10	011491910001	1 to 1	2	18 Feb 19	19 inch PANEL FRAME

1.9 References

Reference	Title
GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A)	IECEx/ATEX assessment of the AEx-Series Assessment report

1.10 Specific Conditions of Use (unchanged)

The specific conditions of use are remained unchanged.

1.11 Conditions Of Manufacture (unchanged)

No conditions of manufacturer.

1.12 Conclusion

The modifications assessed in this report allow the equipment to maintain compliance with the listed standards, the certification code being unchanged.

1.13 Signatories

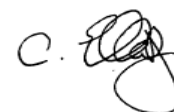
Compiled by + signature (ExTL): **Neil Lin**
Certification Engineer



Reviewed by + signature (ExTL): **Andrew Redeker**
Certification Specialist



Approved by + signature (ExCB): **C Ellaby**
Deputy Certification Manager



2 Relevant Clauses Affected by the Modifications

IEC 60079-0: 2011 Ed. 6			
Clause	Requirement – Test	Result – Remark	Verdict
24	Documentation	See report section 3	Pass
26.5	Thermal tests	See report section 3	Pass
29	Marking	See report section 1.6 and 3	Pass

IEC 60079-11: 2011 Ed. 6			
Clause	Requirement – Test	Result – Remark	Verdict
5.5	Spark ignition compliance	See report section 3.5	Pass
10.1	Spark ignition test	See report section 3.5	Pass
Annex A	Assessment of intrinsically safe circuits	See report section 3.5	Pass

IEC 60079-15: 2010 Ed. 4			
Clause	Requirement – Test	Result – Remark	Verdict
4.2	Potential ignition sources	See report section 3.3	Pass
5	Temperatures	See report section 3	Pass

3 Assessment of Modifications

In this report, reference is made to the original assessment contained in GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A).

The assessments for modifications listed in section 1.1 are detailed below:

Constructional modifications:

- i. Variations to circuit schematic of Mainboard (P/N SBC-7111)
- ii. Variations to circuit schematic of Mainboard (P/N SBC-7114)
- iii. Variations to circuit schematic of converter board TB-547
- iv. Variations to circuit schematic of converter board TB-548
- v. Variations to circuit schematic of small board TB-555
- vi. Add 3 LCD panel sources to 15 inch series (AEx-115Px, AEx-815Px, AEx-915Px)
- vii. Add one CPU sources

See section 3.1 to 3.7

Documentary modifications:

- viii. Updating certification code of BOX PC
- ix. Revision of controlled document drawing no. TB-6029
- x. Revision of controlled document drawing no. 011481610301
- xi. Revision of controlled document drawing no. 011491910001

See section 3.8 and 3.9.

3.1 Variations to circuit schematic of Mainboard (P/N SBC-7111)

Based on declaration of manufacturer and review of updated circuit drawing, the revision of drawing no. SBC-7111 (changed from Rev. 'V1.00' to '3.2') includes below:

- Alternate component: Add U19 in sheet 66 to introduce LCD verification function.

Under the tests (17/0288 and 17/0406) in prime assessment, components of the same size of U19 (between 20 ~ 1000 mm²) were found to conform to the T4 temperature class. Thus the addition of U19 will not compromise the T class and conformance remains. The maximum temperature test is waived, see section 4.1.

3.2 Variations to circuit schematic of Mainboard (P/N SBC-7114)

Based on declaration of manufacturer and review of updated circuit drawing, the revision of drawing no. SBC-7114 (changed from Rev. 'V1.00' to '2.2') includes below:

- Add MCU DETECT EDID circuit (sheet 31) to enable auto display resolution.

This MCU DETECT EDID circuit is considered to process resolution signal feedback from front display panel only. Under the tests (17/0288 and 17/0406) in prime assessment, components of the same size of U117 (between 20 ~ 1000 mm²) were found to conform to the T4 temperature class. Thus the addition of U117 will not compromise the T class and conformance remains. The maximum temperature test is waived, see section 4.1.

3.3 Variations to circuit schematic of converter board TB-547

Based on declaration of manufacturer and review of updated circuit drawing, the revision of drawing no. TB-547 (changed from Rev. 'V1.00' to '1.20') includes below:

- Add some components: U1, U2, U3 and S_1 DIP SWITCH (Accessible during maintenance only)

According to the declaration from manufacturer, U1, U2, and U3 are ICs used to enable resolution detection only, they are not routes of power or current during maximum normal operation of this equipment. Under the tests (17/0288 and 17/0406) in prime assessment, components of the same size of U1, U2 and U3 (between 20 ~ 1000 mm²) were found to conform to the T4 temperature class. Thus the addition of these components will not compromise the T class and conformance remains. The maximum temperature test is waived, see section 4.1.

3.4 Variations to circuit schematic of converter board TB-548

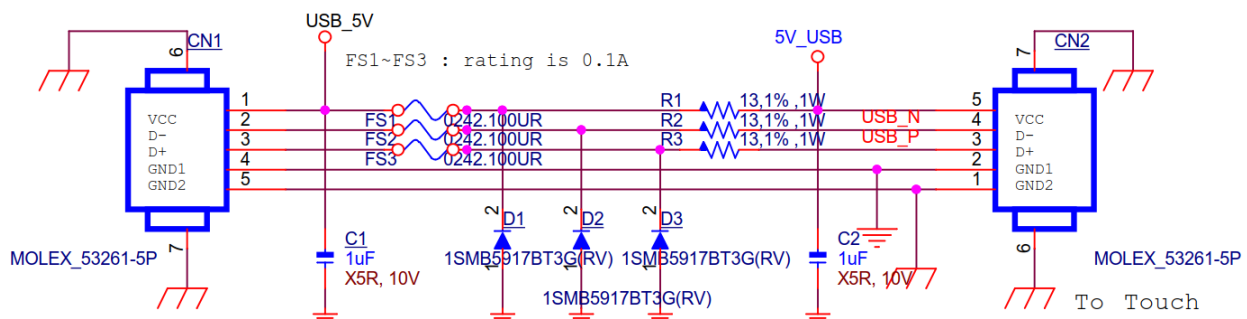
Based on declaration of manufacturer and review of updated circuit drawing, the revision of drawing no. TB-548 (changed from Rev. V1.00 to V1.2) includes below:

- Add some reserved connectors, they are not connected in HazLoc.

No tests were considered necessary.

3.5 Variations to circuit schematic of small board TB-555

Based on declaration of manufacturer and review of updated circuit drawing, the circuit schematic of TB-555 (changed from rev. 1.1 to 1.2) is reproduced as below:



Form TB-547 (M/B)

D1~D3 : MAX. Vz = 4.94V

Based on the reference to the previous assessment conducted in section 4.2 to 4.4 of GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A), the compliance of resistive spark, capacitive spark and inductive spark for connector 'CN2' on small board TB-555 are re-assessed in below sections 3.5.1 to 3.5.3.

3.5.1 Resistive spark ignition assessment and tests

Section 4.2.3 of GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A) was reviewed and re-assessed as below:

On CN2 there are 5 lines: pin 5, 4, 3 are the interface comprises 3 identical lines, and pin 2, 1 are for GND. Pin 5, 4, 3 of CN2 is clamped to maximum 4.94 V and current-limited by a 13 Ω , 1% resistor.

Assessments for 'CN2' on TB-555 are detailed in below:

Pin no. (of "CN2" on TB-555)	Assessment	Limits in IEC 60079-11 Table A.1
Pin 5 (Vcc)	The significant current presented: $(V_{D1(max)})/R1_{(min)} = (4.94)/(13*0.99) = 384mA$	3300 mA for voltage below 12.1 V
Pin 4 (D-)	The significant current presented: $(V_{D1(max)})/R2_{(min)} = (4.94)/(13*0.99) = 384mA$	3300 mA for voltage below 12.1 V
Pin 3 (D+)	The significant current presented: $(V_{D1(max)})/R3_{(min)} = (4.94)/(13*0.99) = 384mA$	3300 mA for voltage below 12.1 V
Pin 2 (GND1)	No changes was made on this line.	N/A
Pin 1 (GND2)	No changes was made on this line.	N/A

The 'CN2' of TB-555 is considered resistively spark safe after the change of resistance of R1 thru R3.

The conformance is considered remained.

3.5.2 Safety components

The list below covers the components used to limit the current into CN2 on TB-555. The component designations are the same as those in drawing no. TB-555.

Only R1, R2 and R3 are changed and described as below:

Designation [function]	Description	Nominal rating (W1)	Max. in use (W2)	De-rating factor (W1/W2)	Comment/calculation
FS1, FS2, FS3 [Protect D1, D2, D3]	Fuse, Littlefuse 242 series, 0.1A	4000A@250VAC	4000A@250VAC	1.0	No change.
R1, R2, R3 [Limit Ii and Ci at pin 5, 4, 3 of CN2]	Resistor, 13 Ω , 1%, min. 1.0W	1.0W	0.372W	2.688	Fuse current = 0.17A, $P_{available} = I^2R = 0.17^2 \times 13 \times 0.99 = 0.372W$
D1, D2, D3 [limit Li at pin 5, 4, 3 of CN2]	Zener diode, ON Semi / 1SMB5917BT3G, 4.94 V max	3 W [1.275W@Ta =60°C]	0.840	1.52	No change.

The conformance is considered remained.

3.5.3 Capacitive spark ignition assessment and tests

Section 4.3 of GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A) was reviewed and re-assessed as below:

There is no change in voltage, the upstream capacitance is still limited by R1 thru R3 and the downstream capacitance are not effected since there is no change on the connected touch boards. Therefore it is still considered capacitively safe and there is no change to the entity parameters.

The conformance is considered remained.

3.5.4 Inductive spark ignition assessment and tests

Section 4.4 of GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A) was reviewed and re-assessed as below:

The upstream inductance still limited by D1 thru D3 and the downstream inductance are not effected since there is no change on the connected touch boards. Therefore it is still considered inductively safe.

External inductance, L_o :

With $L_{max} = 2E/I^2$ and $E = 40 \mu J$ (for group IIC) quoted, according to section 3.5.1, $I_{resistive} = 0.384A$. Thus $L_{max} = 542.54 \mu H$

From section 4.4.1 of previous report GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A), $L_i = 57.74 \mu H$. (unchanged)

L_i is still less than L_{max} , and $L_o = L_{max} - L_i = 542.54 - 57.74 = 484.8 \mu H$.

The conformance is considered remained.

3.5.5 Circuits with both inductance and capacitance

Only 'CN2' is assessed under the intrinsic safety concept and, as shown above, there is only one capacitance: C2, unchanged. And no inductance at this connector. So C-L combinations do not require assessment.

3.6 Add 3 LCD panel sources to 15 inch models

Based on declaration of manufacturer, there are 3 LCD panel sources to be added to 15 inch models (AEx-115Px, AEx-815Px, and AEx-915Px):

- INNOLUX / G150XNE, max. LED power consumption: 12.8W
- AGL / VM15BA V3, max. LED power consumption: 13.4W
- AGL / VM15BA V6, max. LED power consumption: 14.3W

Under the tests (17/0288 and 17/0406) in prime assessment, HOT SPOTS were found on the mainboard and conformed to the T4 temperature class. Change of components on the mainboard had been assessed in previous sections 3.1 to 3.4 and conformance remains.

The LED temperature on the LCD panel effects the service temperature of gasket. Under the tests (17/0288 and 17/0406) in prime assessment, model AEx-915APH installed with: AUO, G150XTN06.3, LED power = 26.4W (datasheet held in file) was tested with gasket service temperature obtained.

The LED power of the added LCD panels listed above are significantly lower than previous tested (26.4W), thus the gasket service temperature obtained in prime assessment will not be compromised.

Thus the conformance remains and the temperature test is waived, see section 4.1.

3.7 Add one CPU sources

Based on declaration of manufacturer: A new CPU source: Intel / Core i7 6600U is to be added.

The representative CPU in previous edition is: Intel / Core i5 6300U, from the specifications supplied by the manufacturer (held in file):

- Intel / Core i5 6300U sheet 1 thru 3 shows TDP = 15W, Configurable TDP-up = 25W, package size = 42 x 42 (mm)
- Intel / Core i7 6600U sheet 1 thru 3 shows TDP = 15W, Configurable TDP-up = 25W, package size = 42 x 42 (mm)

The package size and the power consumption are identical, thus there is no change in T classification.

No tests were considered necessary.

3.8 Update of certification code to BOX PC series

Based on the previous report GB/SIR/ExTR17.0239/00 (Sira free reference R70104059A), the concept of Ex ic involves only with the small converting board: TB-555.

According to manufacturer's declaration, there is no TB-555 Ex ic USB board installed while acting as Box PC, thus there is no Ex-ic concept involved in Box PC and the certification code shall be 'Ex nA IIC T4 Gc'.

The label drawings had been updated accordingly. (See section 1.6 and 1.8)

The BOX PC instructions with updated certification code had been reviewed and store in file.

3.9 Revision of controlled documents

According to manufacturer's declaration, the following documents are revised due to manufacturer's demands:

- Revision of controlled document drawing no. TB-6029:
Update firmware to allow automatically resolution adjustment, only minor revise on circuit connection to CN5 (connector unchanged), update document version from Rev 'V1.00' to 'F'.
- Revision of controlled document drawing no. 011481610301 (15.6 inch PANEL FRAME):
Only change the description of surface pattern.
- Revision of controlled document drawing no. 011491910001 (19 inch PANEL FRAME):
Only change the description of surface pattern.

No tests were considered necessary.

The relevant documents had been reviewed and controlled in section 1.8.

4 Tests

4.1 Tests waived

Test description	Standard ref.	Justification for waiving test
Temperature test	IEC 60079-0: 2011 Ed. 6 clause 26.5, IEC 60079-15: 2010 Ed. 4 clause 5	See section 3.


5 Assessment Against the ATEX Directive 2014/34/EU

The modifications do not affect any of the Essential Health and Safety Requirements (EHSRs) in Annex II of the Directive.



6 IECEx Checklists

6.1 IECEx TEST REPORT COVER

 IECEx TEST REPORT COVER	
ExTR Reference Number.....:	See page 1
ExTR Free Reference Number	See page 1
Compiled by + signature (ExTL)	Refer to section 1
Reviewed by + signature (ExTL).....:	Refer to section 1
Approved by + signature (ExCB) ...:	Refer to section 1
Date of issue	See page 1
Ex Testing Laboratory (ExTL)	CSA Group Testing UK Ltd
Address	Unit 6, Hawarden Industrial Park, Hawarden, Deeside, CH5 3US, United Kingdom
Ex Certification Body (ExCB)	CSA Group Testing UK Ltd
Address	Unit 6, Hawarden Industrial Park, Hawarden, Deeside, CH5 3US, United Kingdom
Applicant's name	Refer to section 1
Address	Refer to section 1
Standards associated with this ExTR package.....:	Refer to section 1
Clauses considered.....:	(All clauses considered / Only specific clauses considered)
Test Report Form Number	ExTR Cover_7 (released 2018-02)
Related Amendments, Corrigenda or ISHs	N/A
Test item description	Refer to section 1
Model/type reference	Refer to section 1
Code (e.g. Ex __ II__ T__).....:	Refer to section 1
Rating	Refer to section 1

ExTR Package Contents

Assembled ExTR documents and Additional reference material:

IECEx Test Report Cover

IECEx Test Report: IEC 60079-0, Edition 6

IECEx Test Report: IEC 60079-11, Edition 6



IECEx Test Report: IEC 60079-15, Edition 4



Manufacturer's name.....:	Refer to section 1		
Address	Refer to section 1		
Trademark	Refer to section 1		
Certificate No. (optional).....:	Refer to section 1		
Particulars: Test item vs. Test requirements			
Classification of installation and use	:	Portable	
Ingress protection	:	>IP20	
Rated ambient temperature range (°C).....:	:	Refer to section 1	
Rated service temperature range (°C) for Ex Components	:	Not a component	
General remarks:			
The test results presented in this ExTR package relate only to the item or product tested.			
§ "(See Attachment #)" refers to additional information appended to the ExTR package.			
§ "(See appended table)" refers to a table appended to the ExTR package.			
§ Throughout this ExTR package, a point is used as the decimal separator.			
§ <i>Where the term "N/A" appears in any part of an ExTR package, it indicates that the associated issue was considered "Not applicable" to the involved evaluation.</i>			
§ <i>In accordance with IECEx 02, a Receiving ExCB may request a sample of the Ex equipment and copies of the documentation referred to in an ExTR Cover.</i>			
The technical content of this ExTR package shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.			
General product information: Refer to section 1			
Details of change (applicable only when revising an existing ExTR package): Refer to section 1			
Copy of Marking Plate: Refer to section 1			
Details regarding 'trade agent' / 'local assembler' application in accordance with OD 203: N/A			
Testing not fully performed by ExTL staff at the above ExTL address: N/A			
National differences considered as part of this evaluation: N/A			
"Specific Conditions of Use" / "Schedule of Limitations": Refer to section 1			
Routine tests: N/A			
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Technical Documents			
Title:	Drawing No.:	Rev. Level:	Date:
Refer to section 1			



6.2 IECEx Test Report Addendum

  IECEX TEST REPORT ADDENDUM	
ExTR Reference Number.....:	See page 1
ExTR Free Reference Number	See page 1
Compiled by + signature (ExTL):	Refer to report summary
Reviewed by + signature (ExTL).....:	Refer to report summary
Date of issue	Refer to report summary
Ex Testing Laboratory (ExTL)	CSA Group Testing UK
Address	Unit 6, Hawarden Industrial Park, Hawarden, Deeside, CH5 3US, United Kingdom
Applicant's name.....:	Refer to report summary
Address	Refer to report summary
Standards.....:	Refer to report summary
Test Report Form Number.....:	ExTR Addendum_3 (released 2018-02)
Related Amendments, Corrigenda or ISHs	Refer to report summary
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