


**Compliance Testing Report  
 For IEC 60695-11-5:2016  
 Fire hazard testing  
 Part 11-5: Test flames -Needle-flame test method – Apparatus,  
 confirmatory test arrangement and guidance**

Client:	Rangerbuilt	
Address:	P O Box 170, Croydon, 3136	
Report Number:	0606RANTUF_695115	
Date of Testing:	1 June 2022 – 6 June 2022	
File Number:	RAN220512	
Equipment Name:	Rangerbuilt	
Equipment Model Number:	Tuflite PETG sheet	
Equipment Description	Rangerbuilt cavity switch unit thermoplastic	
Result:	<b>Complies*</b>	
Tested by:	Praveen Kuncheria Electrical Safety Engineer	
	Kenneth Fu Electrical Safety Manager	
Approved by:		
Date of Issue	6 June 2022	
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## SUMMARY OF COMPLIANCE WITH INTERNATIONAL STANDARD IEC 60695-11-5:2016

The EUT (Equipment Under Test) was known as Rangerbuilt cavity switch thermoplastic, model number: Tuflite PETG sheet, and was supplied for IEC 60695-11-5:2016 partial testing by Rangerbuilt of P O Box 170, Croydon, 3136.

The guideline of IEC 60695-11-5:2016 was used to determine results of the Needle flame test.

The Rangerbuilt cavity switch unit thermoplastic, model number Tuflite PETG sheet **COMPLIES** with the tested clauses of IEC 60695-11-5:2016.

### Method

Testing was performed in accordance with the standard:

60695man

Issue 1

### Possible Test Case Verdicts:

- test case does not apply to the test object ..... N(.A)
- test object does meet the requirements..... P(ass)
- test object does not meet the requirements ..... F(ail)
- testing was not performed ..... NT
- note..... ND

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IEC 60695-11-5:2016			
Clause	Requirement – Test	Result – Remark	Verdict
<b>8</b>	<b>Conditioning and test conditions</b>		<b>P</b>
8.1	Conditioning if not otherwise specified in the relevant specification, the test specimen and the tissue-covered wooden board shall be conditioned for not less than 24 h in an atmosphere having a temperature between 15 °C and 35 °C and a relative humidity between 45 % and 75 % before starting the test. Once removed from the conditioning atmosphere, the test specimens shall be tested within 1 h (see ISO 291).		P
8.2	Test conditions Unless otherwise specified, all test specimens shall be tested under standard atmospheric conditions for testing as follows: - temperature: 15 °C to 35 °C; and - relative humidity: ≤75 %.		ND
9	Test Procedure		P
9.1	General Warning Precautions Warning shall be taken to safeguard the health of the personnel conducting tests against: - the risks of explosion or fire; the inhalation of smoke and for toxic products; and - toxic residues.		P
9.2	Position of test specimen Unless otherwise specified in the relevant specification, the test specimen shall be arranged in a position of normal use such that ignition is most likely to occur during the test. The means to fix the test specimen shall not influence the effect of the test flame or the propagation of flames in a way other than that occurring under normal conditions of use.		P
9.3	Application of needle-flame		P
	The test flame shall be applied to that part of the surface of the test specimen which is most likely to be affected by flames resulting from normal use or from fault conditions. Examples of flame test positions are shown in Figures 2a and 2b.		P
	The duration of application of the test flame shall be as specified in the relevant specification.	As per client request, duration of application of test flame was 30 seconds	P

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IEC 60695-11-5:2016			
Clause	Requirement – Test	Result – Remark	Verdict
	With the central axis of the burner tube vertical, place the burner remote from the test specimen, set the burner (see 5.1) to produce a standardized 12 mm nominal test flame, conforming to 5.3. Wait for a minimum of 5 min to allow the burner conditions to reach equilibrium. Rotate the burner so that the burner tube is positioned at an angle of $45 \pm 5^\circ$ from the vertical (see Figure 1) throughout the duration of the test.		P
	The test flame shall be positioned so that the tip of the flame is in contact with the surface of the test specimen. If the test specimen is located vertically above the test flame, a spacing of 8 mm $\pm 1$ mm shall be maintained between the centre of the top of the burner and the remaining portion of the test specimen during the test, ignoring any strings of molten material. If the test specimen is located horizontally from the test flame, a spacing of 5 mm $\pm 1$ mm shall be maintained between the centre of the top of the burner and the remaining portion of the test specimen during the test (see Figure 1).		P
	The test flame is removed after the specified flame application time ( $t_a$ ) (see Clause T)	30seconds as per client request	P
	When required by the relevant specification, the test is applied at more than one point on the same test specimen, in which case care shall be taken to ensure that any deterioration caused by previous tests will not affect the result of the test to be conducted		N
9.4	Number of test specimens		P
	Unless otherwise specified in the relevant specification, the test is performed on three test specimens.		P
<b>10</b>	<b>Observations and measurements</b>		P
	In the case of ignition of the test specimen and for the specified layer and for the surrounding parts, the duration of burning ( $t_b$ ) is measured and reported. Ignition of the specified layer shall be observed and noted. The duration of burning denotes the time interval from the moment the test flame is removed from the test specimen, until the last flames have extinguished and the glowing combustion of the test specimen, the specified layer and for the surrounding parts is no longer visible.	Refer to appended flammability test results	P
<b>11</b>	<b>Evaluation of test results</b>		P
	The test specimen is considered to have satisfactorily withstood the needle-flame test if one of the following criteria applies:		P

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IEC 60695-11-5:2016			
Clause	Requirement – Test	Result – Remark	Verdict
	a) There is no ignition of the specified layer and, after the removal of the needle-flame, there is no flame and no glowing of the test specimen.		N
	b) Flames or glowing of the test specimen and the surrounding parts extinguish within 30 s after the removal of the needle-flame, that is $t_b < 30s$ . Also, the surrounding parts have not burnt away completely and there has been no ignition of the specified layer.		P

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Clause	Requirement – Test	Result – Remark	Verdict

TABLE: Critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
cavity switch unit thermoplastic	Chemwatch	Tuflite PETG sheet	-	IEC 60695-11-5:2016	Tested with the equipment

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IEC 60695-11-5:2016
FLAMMABILITY TEST RESULTS

**Needle-flame test on PCB**

The specimens were tested by application of the test flame for 30 s, not less than 10 mm from a corner.

IEC 60695.11.5 Clause	SPECIMEN NUMBER ⇒	A1	A2	A3	
6	How tested	C	C	C	
7	Duration of flame application (t <sub>a</sub> )	30	30	30	
5.4	Specified layer used	WT	WT	WT	
11a)	Flame or glowing of test specimen or ignition of specified layer or wrapping tissue	Flame of specimen	Flame of specimen	Flame of specimen	
11b)	Flame or glowing of test specimen and surrounding parts extinguish within 30 s after the removal of the needle-flame (t <sub>b</sub> < 30 s)	15	8	12	
11*	RESULT	P	P	P	

**Legend:**

- |  |   |
|--|---|
| P-Pass;<br>F-Fail;<br>NA-Not Applicable;   | For clause 6:<br>CE-Complete Equipment;<br>SA-Sub-Assembly;<br>C-Component; |
| For clause 5.4:<br>WT-Wooden board covered with wrapping tissue;<br>SP-Surrounding part/material situated underneath the test specimen in normal use | For Clause 11:<br>ME-Manually Extinguished;<br>NI-No Ignition;              |

\*Specimen satisfies requirements if either 11a) or 11b) complies. "Yes" does not constitute a point of non-compliance with 11a) if the requirements of 11b) are met.

- Notes:**
1. PCB specimens with an FV-0 classification in accordance with IEC 707, need not be tested.
  2. Boards are tested oriented in their normal position of use.

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IEC 60695-11-5:2016

FLAMMABILITY TEST RESULTS

**\*\*\*END OF BODY REPORT\*\*\*****Appendix 1 – Photographic Record of Sample**

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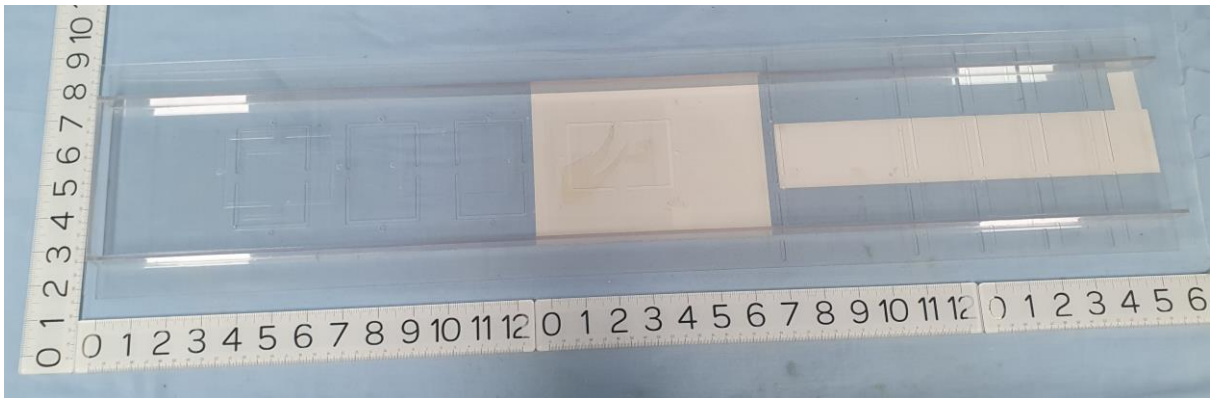
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**Appendix 1 – Photographic Record of Sample**



Cavity switch unit- Front



Cavity switch unit- Back

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**Appendix 1 – Photographic Record of Sample**



Cavity switch thermoplastic sample 1



Cavity switch thermoplastic sample 1 after needle flame test

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**Appendix 1 – Photographic Record of Sample**



Cavity switch thermoplastic sample 2



Cavity switch thermoplastic sample 2 after needle flame test

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**Appendix 1 – Photographic Record of Sample**



Cavity switch thermoplastic sample 3



Cavity switch thermoplastic sample 3 after needle flame test

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