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TITLE	:	Report on the evaluation of the fire propagation properties of the **IsoBoard** Extruded Polystyrene insulation system product range using the **SANS 10177 – Part 5, 10 and 11 (H & V)** test protocol in terms of **SANS 428**
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CONTRACT No	:	FTC15/029
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1. INTRODUCTION

The purpose of the investigation was to evaluate the fire propagation properties of the **IsoBoard** Extruded Polystyrene product range for industrial and commercial buildings in terms of **SANS 428** as supplied by **Isofoam South Africa (Pty) Ltd**.

2. SAMPLE DESCRIPTION

The **IsoBoard** products had the following characteristics:

Physical Properties:

Mass:	32 – 36	kg/m^3
Thickness:	25 – 80	mm
Width:	600	mm
Length:	6 000	mm
Batch Number:		*Unknown*
Manufacturing Date:		*Unknown*

Product Composition:

Material:	32 – 36	kg/m^3 Extruded Polystyrene (XPS)
Facings:	–	*None*

Joint details:

Joint (25 – 50 mm):	Tongue and Groove (T & G)
Joint (60 – 80 mm):	Shiplap

Intended usage:

Over-purlin under-roof insulation in industrial and commercial buildings using profiled metal roof sheeting.

Generic Identification:

White high density Extruded Polystyrene (XPS)

Product information as supplied by **Isofoam South Africa (Pty) Ltd** can be found in **Annexure "A"**.

3. TEST PROCEDURES

3.1. SANS 10177 – PART 5: 2012 (COMBUSTIBILITY)

For this evaluation, a number of 40 x 40 mm samples was prepared and in turn placed on a sample holder and lowered into the standard **SANS 10177-5** electrically-heated furnace, which has been pre-set to have a furnace enclosure temperature of 750 °C. The standard test duration is 10 minutes.

The test criteria for non-combustibility are that the specimen should neither increase the furnace enclosure temperature by more than 50 °C nor support flaming continuously for more than 10 seconds during the exposure period. Should either of these criteria not be met, the material will be regarded as combustible at 750 °C.

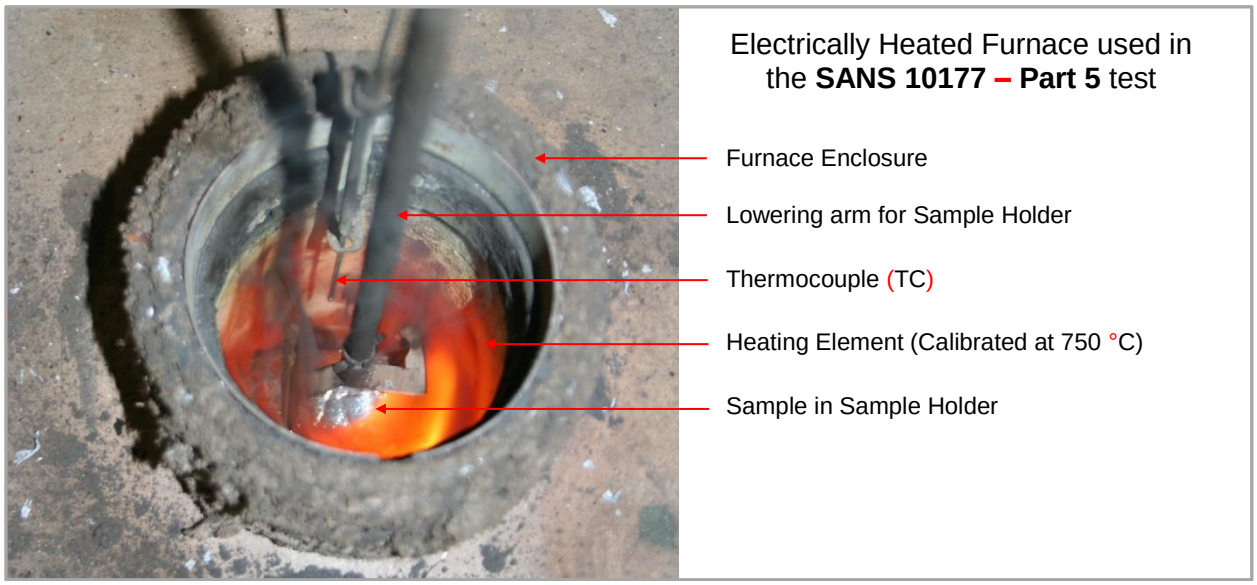

*Figure 3.1.1: Electrically Heated Furnace used in the **SANS 10177 – Part 5** test*

3.2. SANS 10177 – PART 10 (FLAME SPREAD)

The installation was representative as would normally be done in practice for an over-purlin under-roof installation in buildings using profiled roof sheeting. The specimens were installed according to manufacturer's installation instructions in the channel tunnel facility shown in Figure 3.2.1.

The fire-spread properties of the insulation material tested, envisaged for use in buildings, are classified according to **Annex C** of **SANS 428**, Surface fire properties, also taking in consideration the limitations regarding the use of non-combustible materials described in **SANS 10400 – T**.

Temperatures were measured during the investigation with thermocouples located 20 mm below the installation at 1 m centres. The test installation was exposed to the thermal output of three litres of n-hexane, which was placed in the fire source tray. Temperatures were continuously recorded and observations were noted of the behaviour of the material.

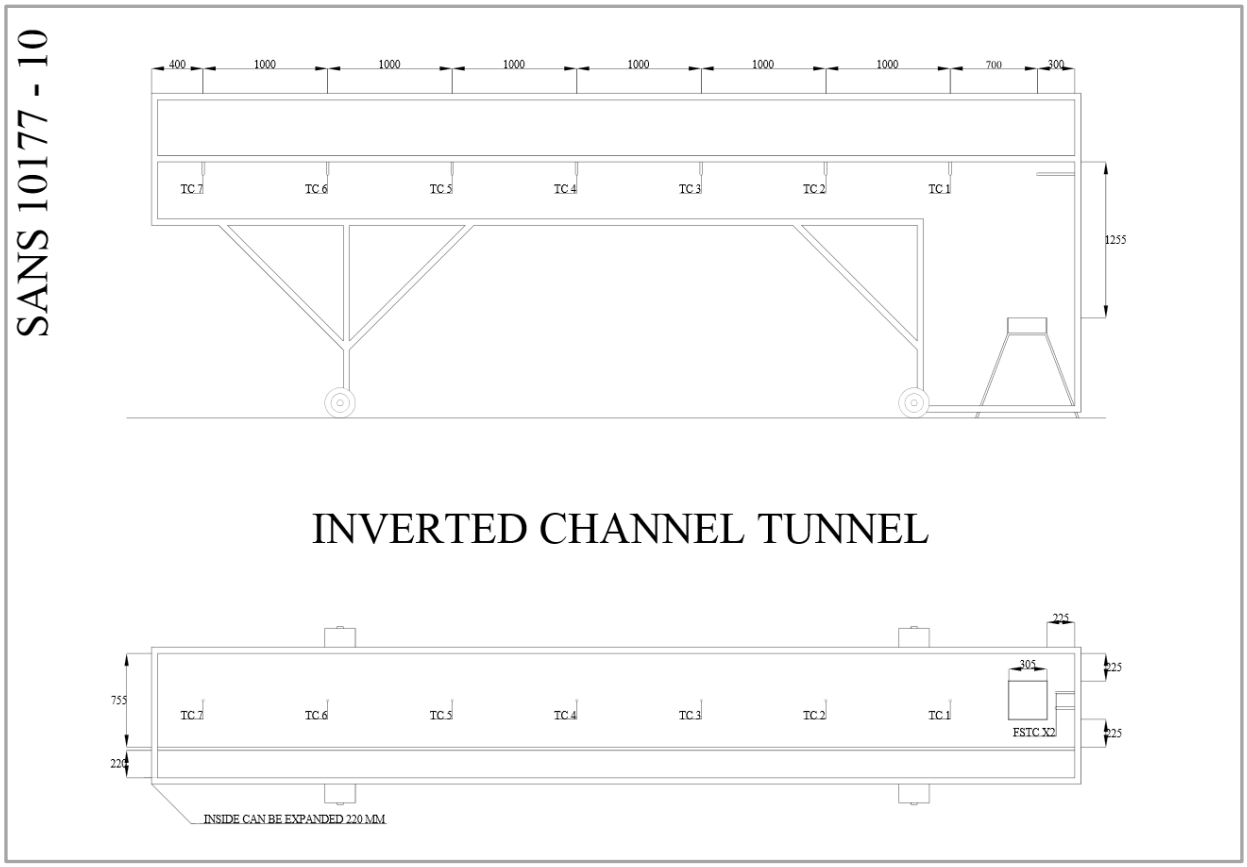

*Figure 3.2.1: Diagram of **SANS 10177 – 10** inverted channel testing facility*

3.3. SANS 10177 – PART 11, HORIZONTAL (CLASSIFICATION)

The large-scale fire propagation properties of the system were evaluated by performing a test in the **FIRELAB** large-scale roof insulation test facility. A schematic diagram of the test facility with the specimen frames are shown in Figure 3.3.1 and 3.3.2.

The ignition source for the under-roof evaluation was constructed from 60 kg dry 38 mm x 38 mm SA Pine sticks stacked in an open-crib configuration to form a 1 000 mm x 750 mm x 480 mm high crib. The pack was ignited with commercial firelighters at each corner, in order to simulate a fire with slow heat build-up. The maximum heat output of the fire source (approximately 2.5 MW based on previous research) occurred after approximately 12 minutes.

The fire source was located at one end of the facility, approximately 1.5 m from the front end, 1.5 m from the side and 1.5 m from the center line of the specimen frame. The position of the crib is indicated on Figure 3.3.1. No mass loss measurements were taken during the evaluations.

This test was performed simulating a roof insulation system. This evaluation investigated the fire propagation properties of the Extruded Polystyrene insulation with the purlins positioned across the width of the test facility. A schematic side view of a typical roof test installation is shown in Figure 3.3.2.

For this evaluation the specimen frames were aligned in such a way that the roof slope was equal to 3 degrees. The distance between the top of the fire source and the roof directly above it was 2.7 metres.

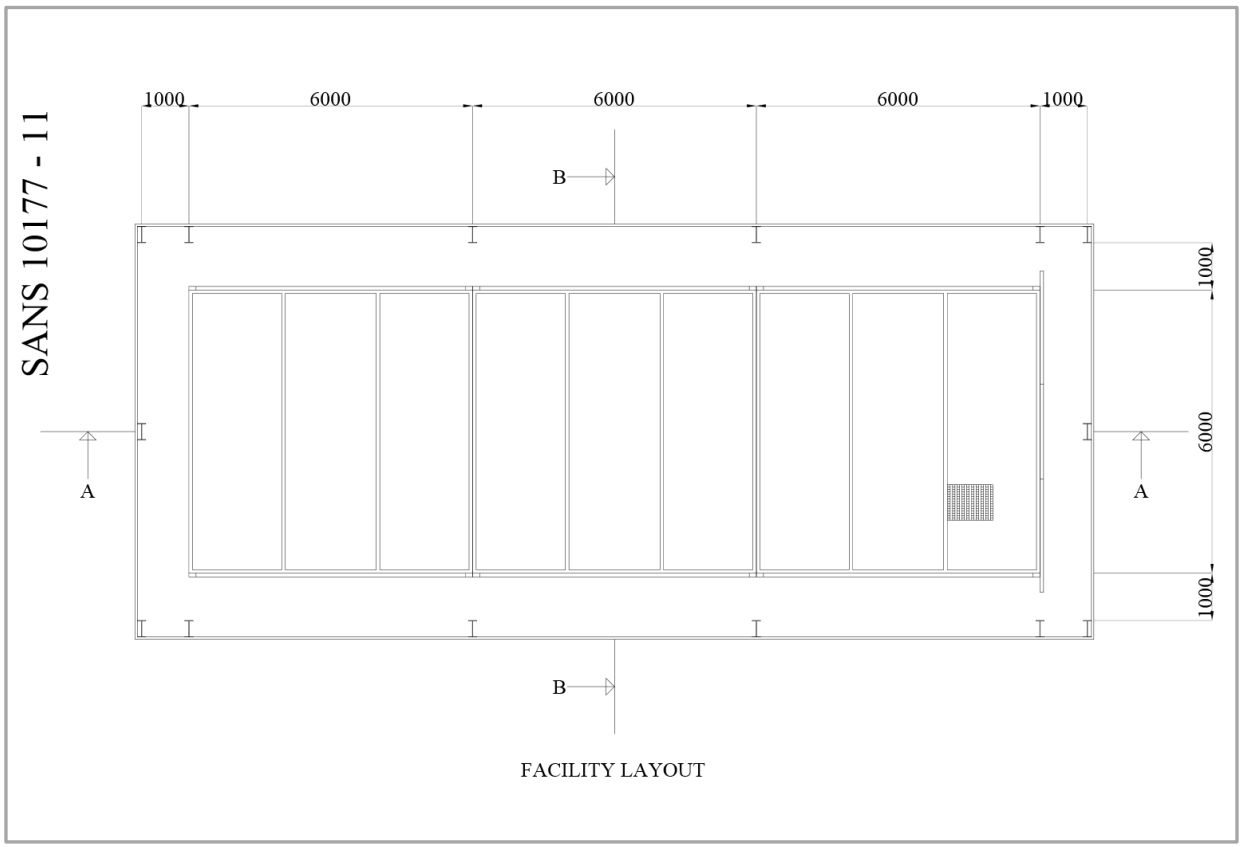

*Figure 3.3.1: **SANS 10177 – Part 11** test facility with specimen frames*

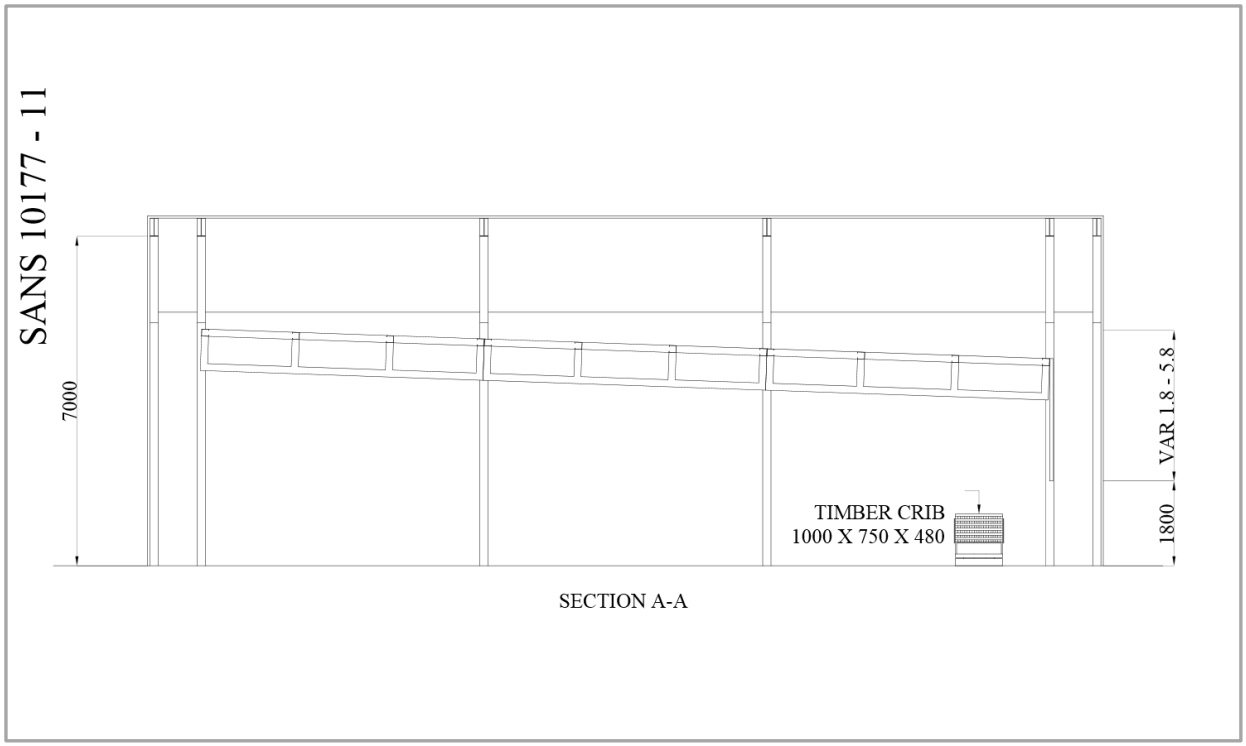

*Figure 3.3.2: Typical roof test installation in the **SANS 10177 – Part 11** facility*

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3.4. SANS 10177 – PART 11, VERTICAL (CLASSIFICATION)

The fire propagation properties associated with the use of this insulation system in a side cladding application were investigated in terms of the relevant section of **SANS 10177-11**.

A vertical specimen frame was fitted to the front end of the test installation against the first horizontal hanging frame. The insulation material was installed onto the inside between the horizontal purlins. The fire source was placed 600 mm either side of the center of the vertical frame. A typical installation is shown schematically in Figure 3.4.1 and Figure 3.4.2.

The fire source consisted of two packs of 7.5 kg consisting of 38 mm x 38 mm pine sticks, each 300 mm in length, four per layer and ten layers high.

No temperatures were recorded during this evaluation. The criterion that will be applied when assessing whether the material is suitable for vertical applications is that flame spread onto the roof portion will not be allowed.

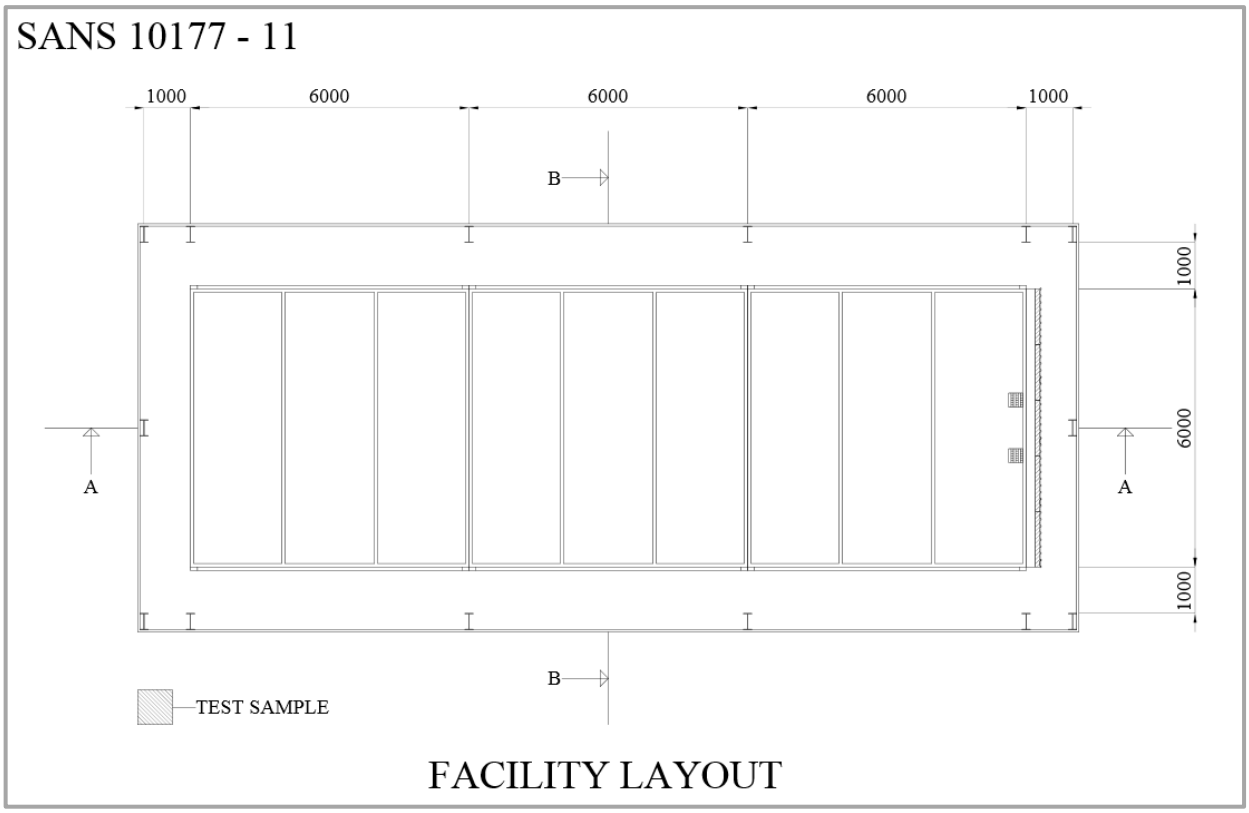

*Figure 3.4.1: **SANS 10177-11** facility plan view for vertical test*

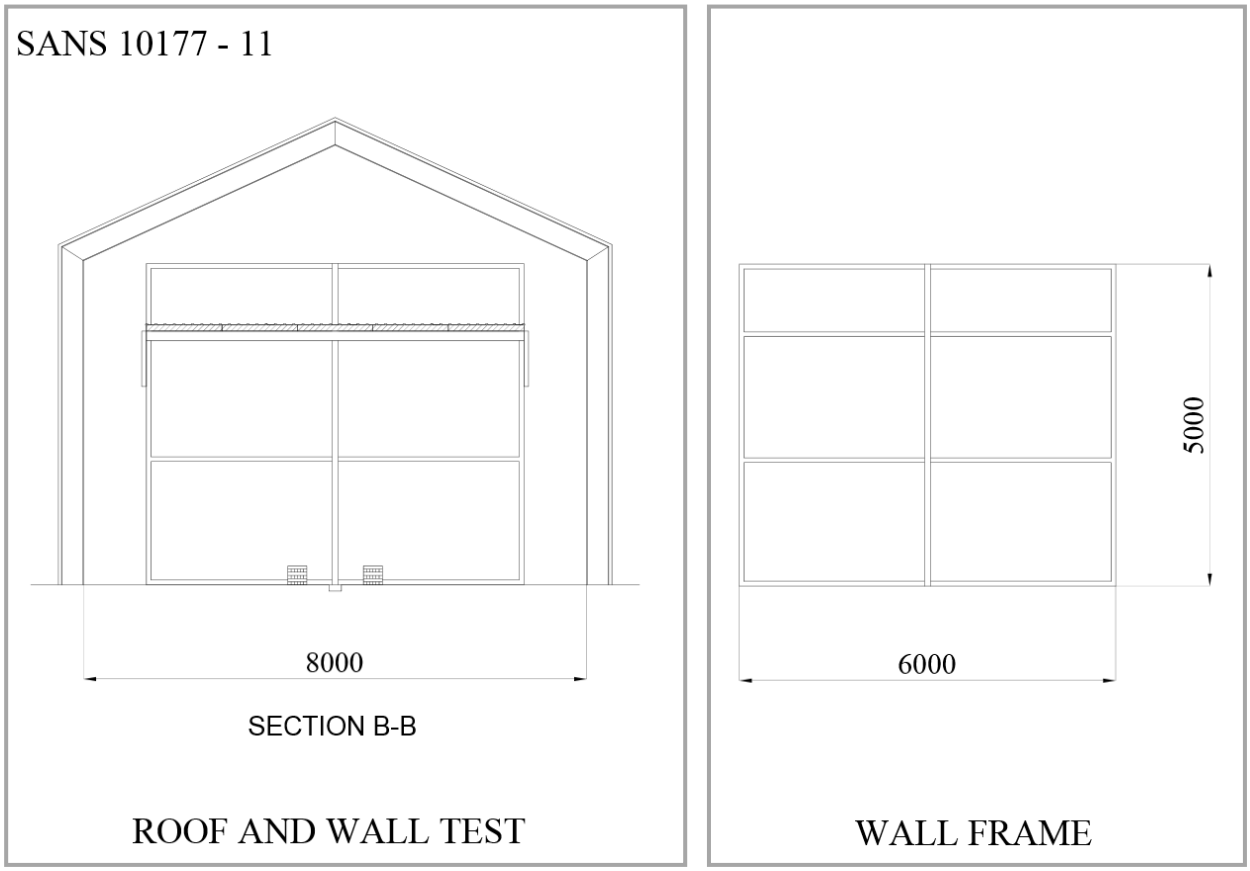

*Figure 3.4.2: Typical side-cladding installation in **SANS 10177-11** facility*

4. TEST RESULTS

4.1. SANS 10177 – PART 5: 2012 (COMBUSTIBILITY)

Should the furnace enclosure temperature be raised above 800 °C or the material support flaming for longer than 10 seconds during the exposure period, the material will be regarded as combustible at 750 °C.

Table 4.1.1 below gives the individual burn times and heat contribution for the 6 specimens tested within the **SANS 10177 – Part 5** facility.

Isofoam South Africa (Pty) Ltd – IsoBoard (32 – 36 kg/m^3)				
Sample number	**Time to ignition (mm:ss)**	**Time to extinguishment (mm:ss)**	**Burn time (mm:ss)**	**Heat Contribution (°C)**
1	00:03	00:30	00:27	< 50
2	00:02	00:32	00:30	< 50
3	00:06	00:34	00:28	< 50
4	00:06	00:34	00:28	< 50
5	00:07	00:39	00:32	< 50
	Classification:		**Combustible**	

*Table 4.1.1: Combustibility results from the **SANS 10177-5** test*

The material would therefore be regarded as combustible at 750 °C given that the burn times did exceed 10 seconds. The furnace enclosure temperature was not however increased by more than 50 °C.

4.2. SANS 10177 – PART 10 (FLAME SPREAD)

4.2.1. 25 MM ISOBOARD PANEL

The test installation in the **SANS 10177 – Part 10** facility prior to ignition of the fire source is shown in Figure 4.2.1.1 and at the conclusion of the test in Figure 4.2.1.8.

Observations made during **SANS 10177-10** test are depicted in Table 4.2.1.1 below:

Isofoam South Africa (Pty) Ltd – 25 mm IsoBoard	
OBSERVATIONS DURING THE **SANS 10177 – PART 10** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
00:35	Joint started opening
01:10	Material shrinking away
01:25	Joint open
01:50	Softened material draping and dropping down
05:40	Material drape up to 2 meters
06:00	Heat damage up to 3 meters
08:50	Material drape up to 4 meters and starting to drop down
09:20	Heat damage past 4 meters
10:40	Molten droplets up to 2 meters (trapped material)
12:00	Material draped up to 6 meters
13:15	Fire Source consumed **– Test end –**
Note(s):	Molten debris above Fire Source No ignition during test

*Table 4.2.1.1: Observations made during the **SANS 10177 – Part 10** test*

The temperatures recorded during the test in the **SANS 10177-10** facility are depicted graphically in Figure 4.2.1.9.

Figure 4.2.1.1: The test installation prior to ignition of the Fire Source

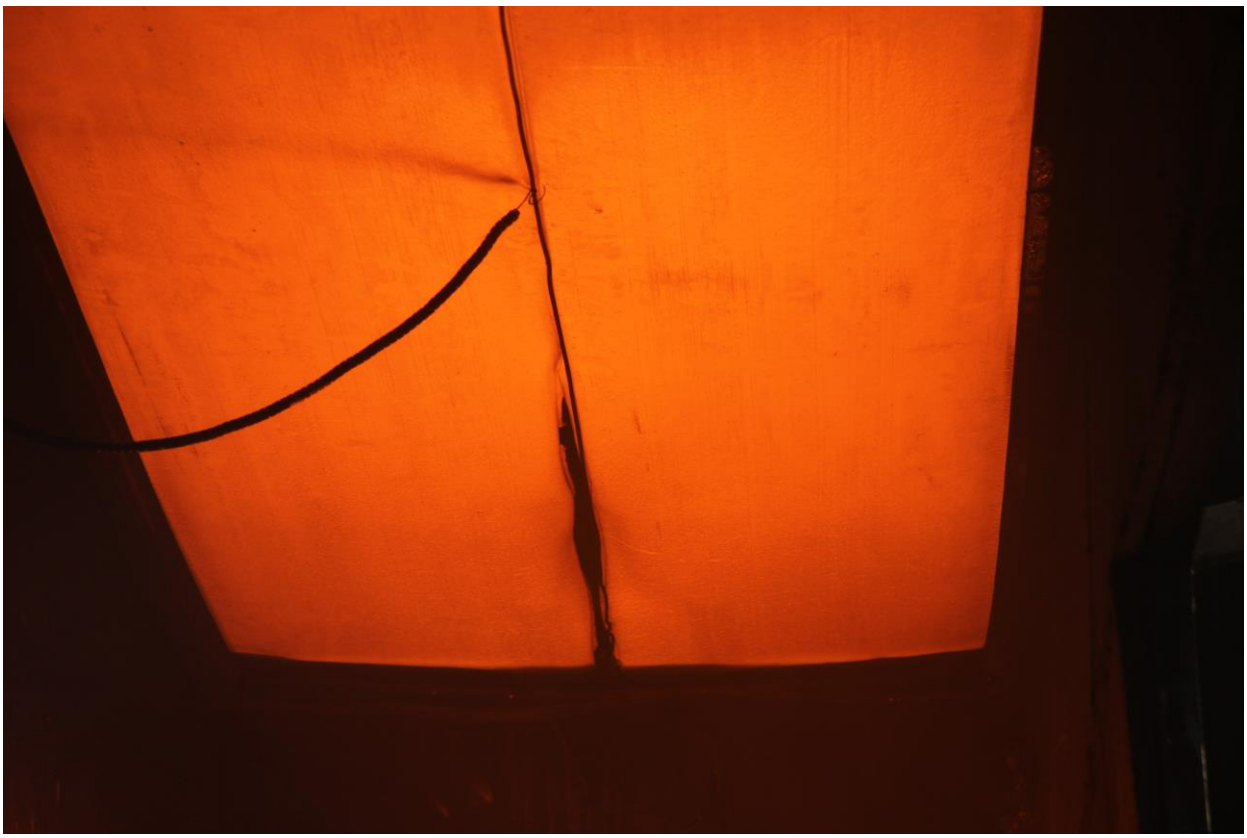

Figure 4.2.1.2: Joint opening up above Fire Source

Figure 4.2.1.3: Material softening and starting to drape and drop out above the Fire Source

Figure 4.2.1.4: Heat damage and material draping up to 2 meters

Figure 4.2.1.5: Material dropping out to 2 meter mark and draping up to 4 meters

Figure 4.2.1.6: Heat damage up to 6 meter mark and dropping out up to 4 meters

Figure 4.2.1.7: Full length heat damage with material dropping out to 4 meters

*Figure 4.2.1.8: Test specimen at conclusion of **SANS 10177 – 10** test*

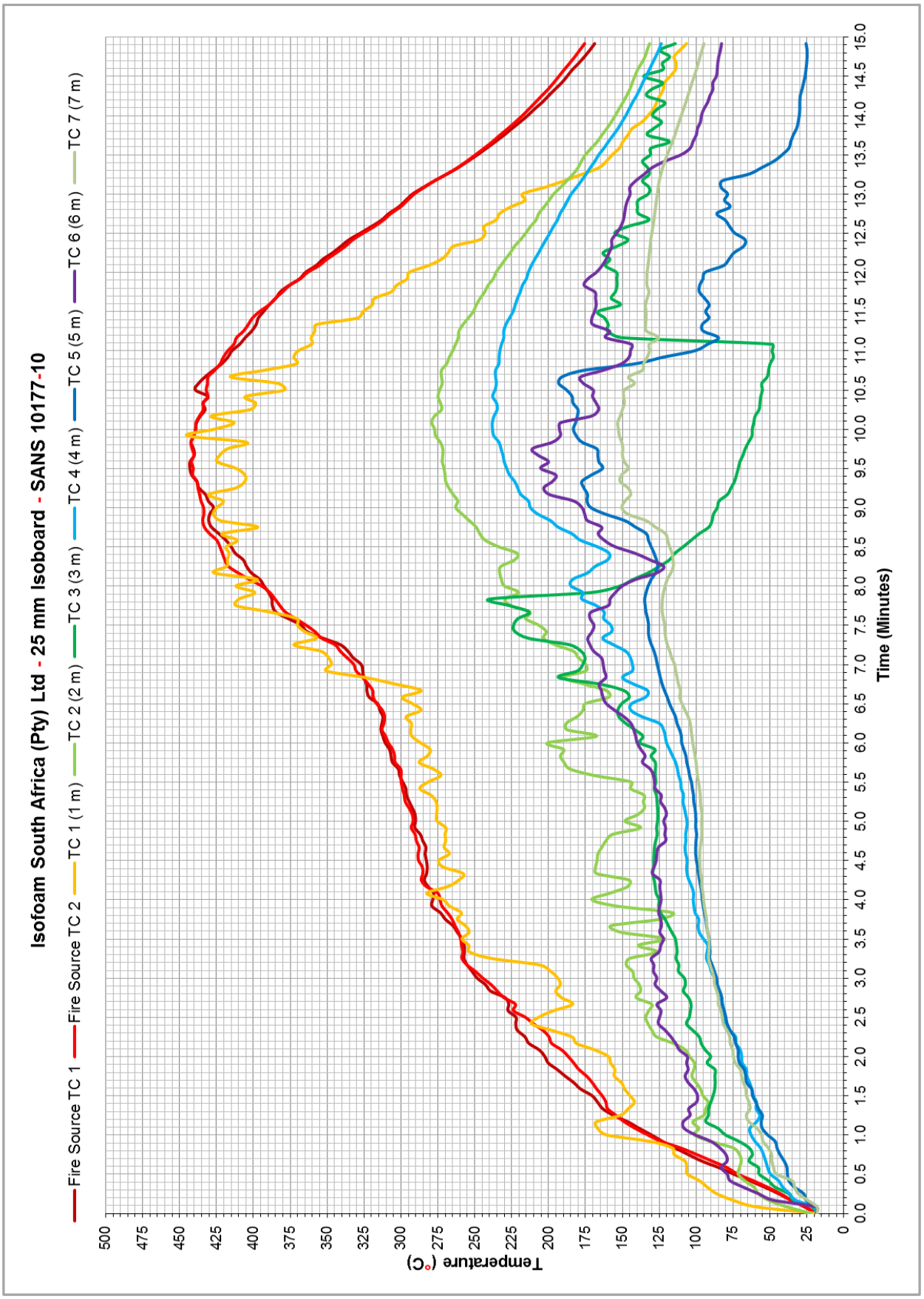

*Figure 4.2.1.9: Temperatures recorded during the **SANS 10177 – Part 10** test*

4.2.2. 30 MM ISOBOARD PANEL

The test installation in the **SANS 10177 – Part 10** facility prior to ignition of the fire source is shown in Figure 4.2.2.1 and at the conclusion of the test in Figure 4.2.2.6.

Observations made during **SANS 10177-10** test are depicted in Table 4.2.2.1 below:

Isofoam South Africa (Pty) Ltd – 30 mm IsoBoard	
OBSERVATIONS DURING THE **SANS 10177 – PART 10** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
00:50	Material started shrinking and joint open
02:00	Joint completely open above Fire Source
02:25	Material starts draping and dropping out
04:00	Heat damage and material dropping out up to 2 meters
06:15	Material draping past 2 meter mark
09:35	Material dropping out up to 4 meters and draping up to 6 meters
14:17	Fire Source consumed **– Test end –**
Note(s):	Molten debris above Fire Source No ignition during test

*Table 4.2.2.1: Observations made during the **SANS 10177 – Part 10** test*

The temperatures recorded during the test in the **SANS 10177-10** facility are depicted graphically in Figure 4.2.2.7.

Figure 4.2.1.1: The test installation prior to ignition of the Fire Source

Figure 4.2.1.2: Heat damage above Fire Source with joint opening

Figure 4.2.1.3: Material draping up to 2 meters

Figure 4.2.1.4: Material dropping out and draping up to 4 meters

Figure 4.2.1.5: Full length heat damage with material draping out up to 6 meters

*Figure 4.2.1.6: Test specimen at conclusion of **SANS 10177 – 10** test*

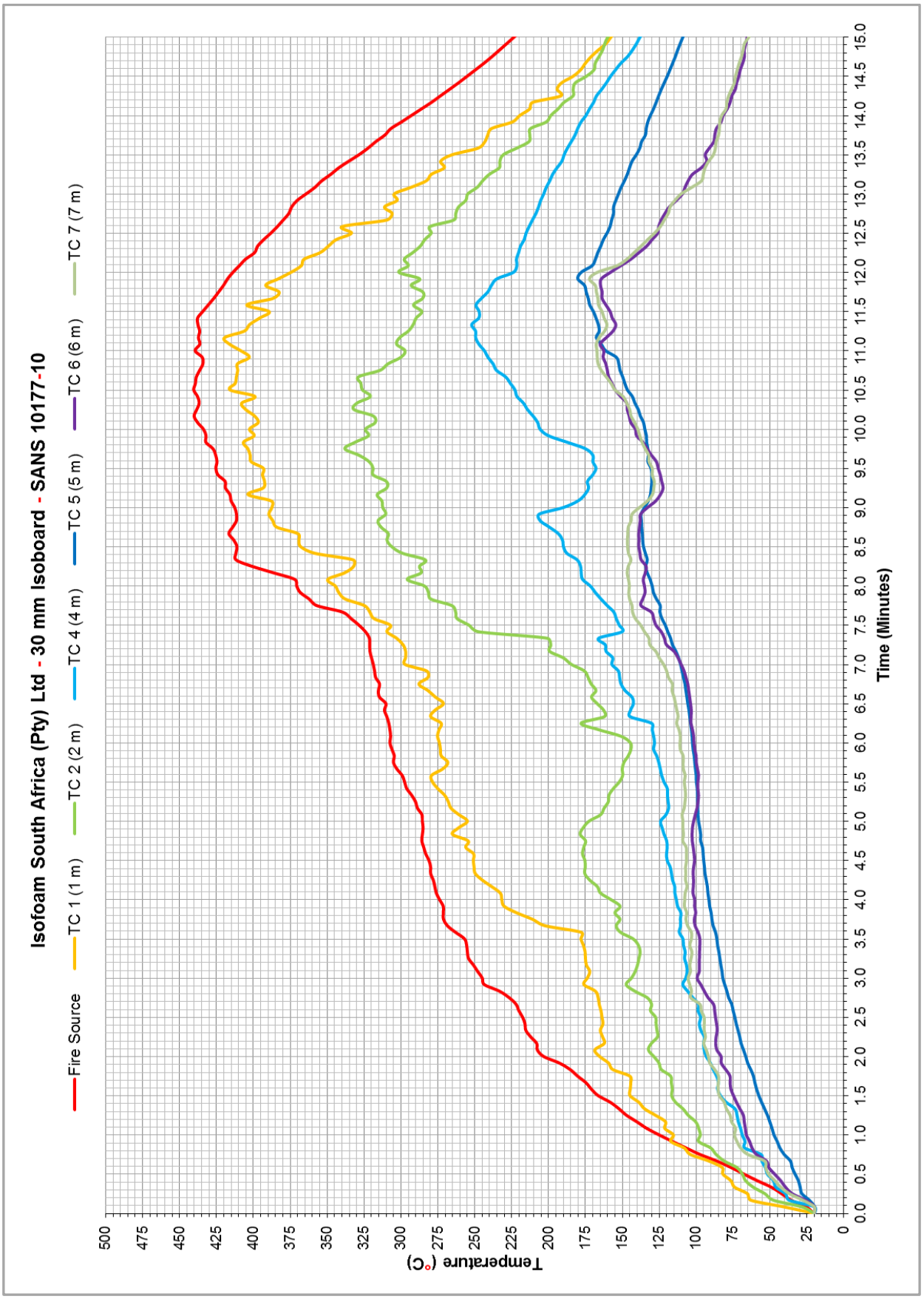

*Figure 4.2.2.7: Temperatures recorded during the **SANS 10177 – Part 10** test*

4.2.3. 40 MM ISOBOARD PANEL

The test installation in the **SANS 10177 – Part 10** facility prior to ignition of the fire source is shown in Figure 4.2.3.1 and at the conclusion of the test in Figure 4.2.3.8.

Observations made during **SANS 10177-10** test are depicted in Table 4.2.3.1 below:

Isofoam South Africa (Pty) Ltd – 40 mm IsoBoard	
OBSERVATIONS DURING THE **SANS 10177 – PART 10** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
01:00	Material starts shrinking above Fire Source
01:20	Joint starts to pull open
01:50	Discoloration of material started above Fire Source
02:10	Joint completely open
03:00	Material softening and flowing down
04:15	Molten material draping down
08:00	Material continue to flow down
09:00	Material draping over purlin at 2 meter mark
09:40	Softening of material continue past 2 meter mark and draping down
09:45	Material trapped on purlin in Ignition Source Area starts burning
13:00	Fire Source starting to decay
14:00	Fire Source consumed **– Test end –**
Note(s):	–

*Table 4.2.3.1: Observations made during the **SANS 10177 – Part 10** test*

The temperatures recorded during the test in the **SANS 10177-10** facility are depicted graphically in Figure 4.2.3.9.

Figure 4.2.3.1: The test installation prior to ignition of the Fire Source

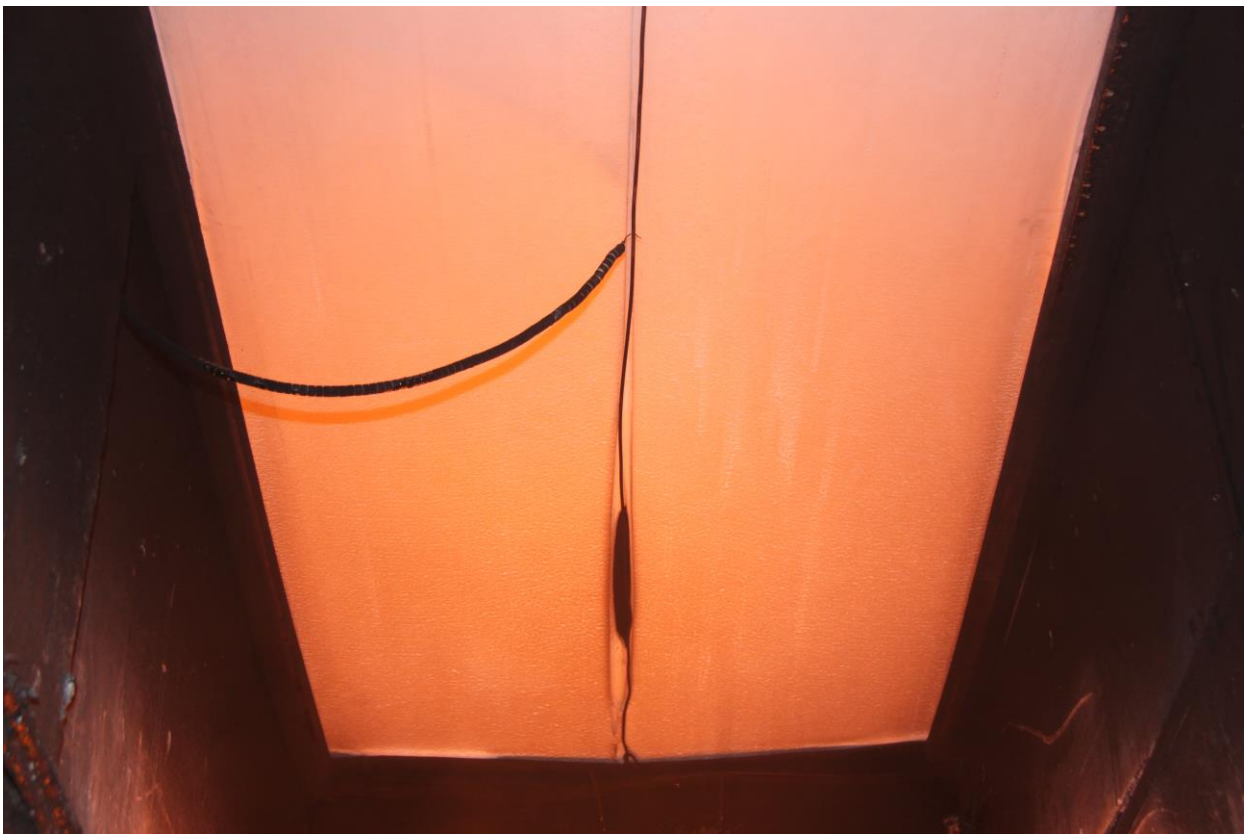

Figure 4.2.3.2: Material shrinking and joint starting to open up

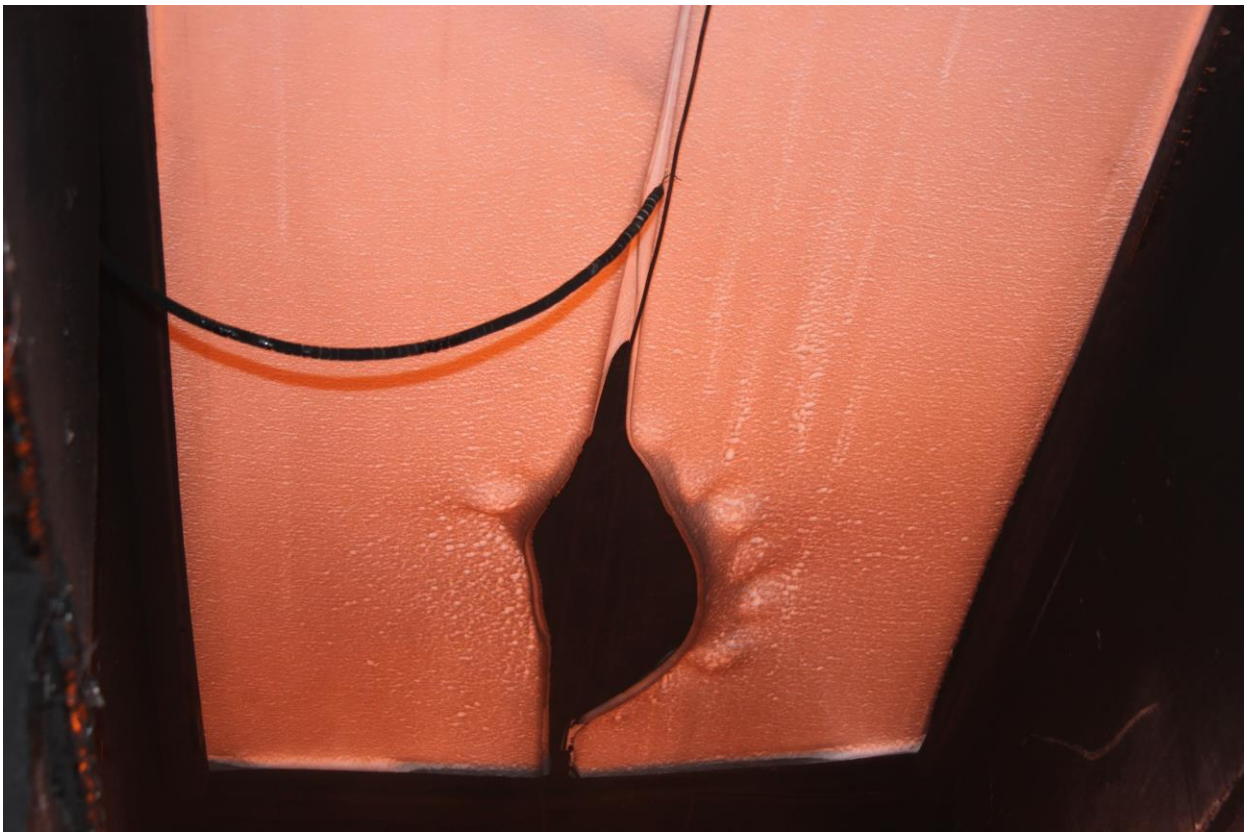

Figure 4.2.3.3: Material discolouring with joint opening above Fire Source

Figure 4.2.3.4: Material softening and flowing down in Ignition Source Area

Figure 4.2.3.5: Material draping and dropping out up to 2 meter mark

Figure 4.2.3.6: Material draping up to 4 meter mark

Figure 4.2.3.7: Heat damage up to 6 meter mark with material dropping out

*Figure 4.2.3.8: Test specimen at conclusion of **SANS 10177 – 10** test*

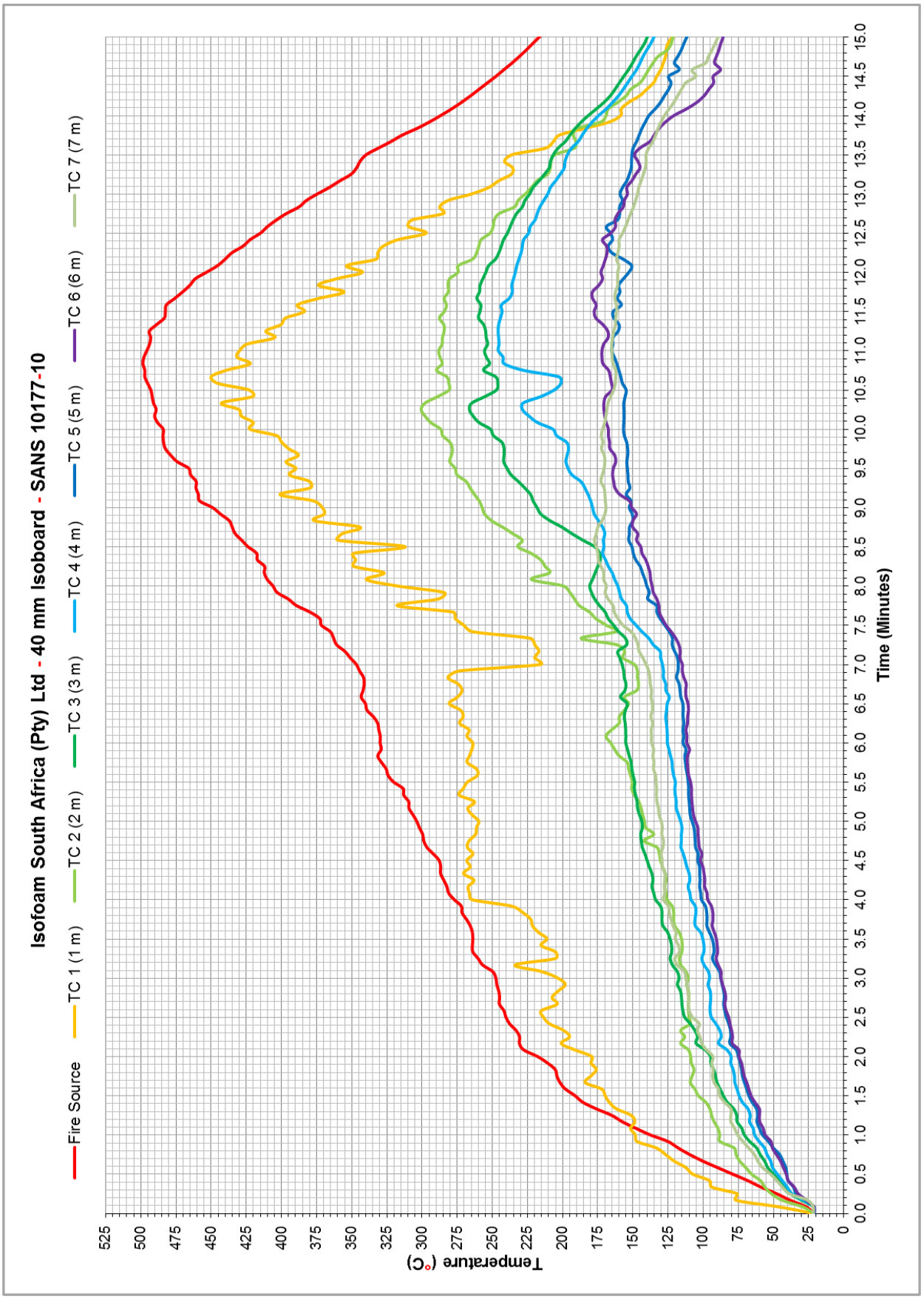

*Figure 4.2.3.9: Temperatures recorded during the **SANS 10177 – Part 10** test*

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4.2.4. 50 MM ISOBOARD PANEL

The test installation in the **SANS 10177 – Part 10** facility prior to ignition of the fire source is shown in Figure 4.2.4.1 and at the conclusion of the test in Figure 4.2.4.8.

Observations made during **SANS 10177-10** test are depicted in Table 4.2.4.1 below:

Isofoam South Africa (Pty) Ltd – 50 mm IsoBoard	
OBSERVATIONS DURING THE **SANS 10177 – PART 10** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
00:35	Material softening and shrinking away at joint
00:55	Material started shrinking on joint above Fire Source
01:15	Softening and shrinking of material surface above Fire Source
01:50	Joint opens up completely
02:57	Molten droplets within the Fire Source Area
03:50	Softened debris dropping out – Joint separate up to 1 meter mark
08:35	Draping material drops out to 2 meter mark
10:55	Draping material drops out to 3 meter mark
12:35	Draping material drops out to 4 meter mark
13:10	Fire Source starting to decay
14:00	Fire Source consumed **– Test end –**
Note(s):	Molten droplets within Fire Source Area (0 to 2 meters) Heat damage on joint full length (0 to 7 meters)

*Table 4.2.4.1: Observations made during the **SANS 10177 – Part 10** test*

The temperatures recorded during the test in the **SANS 10177-10** facility are depicted graphically in Figure 4.2.4.9.

Figure 4.2.4.1: The test installation prior to ignition of the Fire Source

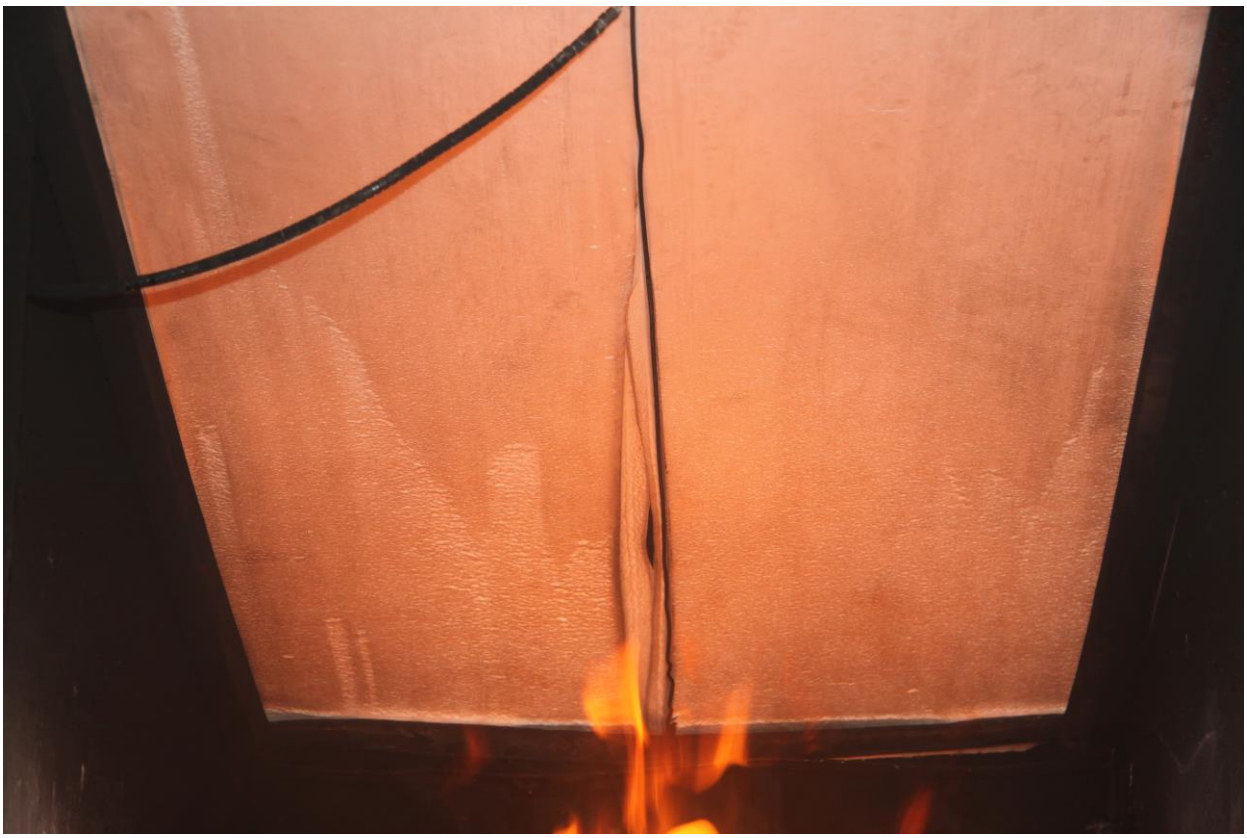

Figure 4.2.4.2: Shrinking of material visible and joint separating above Fire Source

Figure 4.2.4.3: Molten material dropping out within Fire Source Area

Figure 4.2.4.4: Softened material dropping out up to 2 meter mark

Figure 4.2.4.5: Material draping and dropping out up to 4 meter mark

Figure 4.2.4.6: Heat damage on joint full length (0 to 7 meters)

Figure 4.2.4.7: Material draping and dropping out up to 5 meter mark

*Figure 4.2.4.8: Test specimen at conclusion of **SANS 10177 – 10** test*

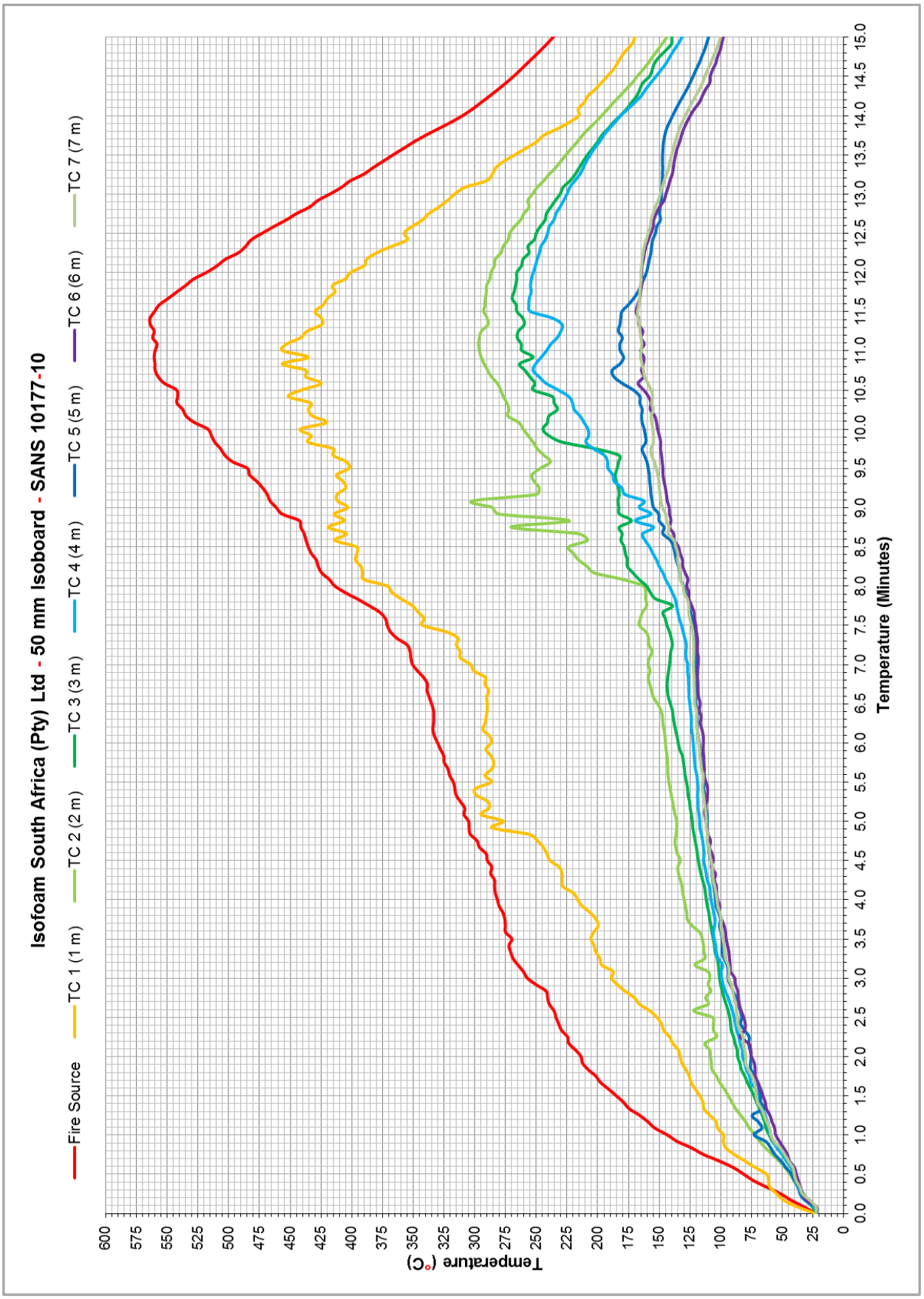

*Figure 4.2.4.9: Temperatures recorded during the **SANS 10177 – Part 10** test*

4.2.5. 80 MM ISOBOARD PANEL

The test installation in the **SANS 10177 – Part 10** facility prior to ignition of the fire source is shown in Figure 4.2.5.1 and at the conclusion of the test in Figure 4.2.5.8.

Observations made during **SANS 10177-10** test are depicted in Table 4.2.5.1 below:

Isofoam South Africa (Pty) Ltd – 80 mm IsoBoard	
OBSERVATIONS DURING THE **SANS 10177 – PART 10** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
00:45	Joint start to shrink away
01:00	Material surface texture start to change above Fire Source
04:05	Charring/darkening of material surface above Fire Source
04:30	Material starts draping along the joint
05:40	Material starts dropping out up to 2 meter mark
11:00	Joint fully separated over entire length (0 to 7 meters)
14:00	Fire Source consumed **– Test end –**
Note(s):	–

*Table 4.2.5.1: Observations made during the **SANS 10177 – Part 10** test*

The temperatures recorded during the test in the **SANS 10177-10** facility are depicted graphically in Figure 4.2.5.9.

Figure 4.2.5.1: The test installation prior to ignition of the Fire Source

Figure 4.2.5.2: Material surface changing with joint separating above Fire Source

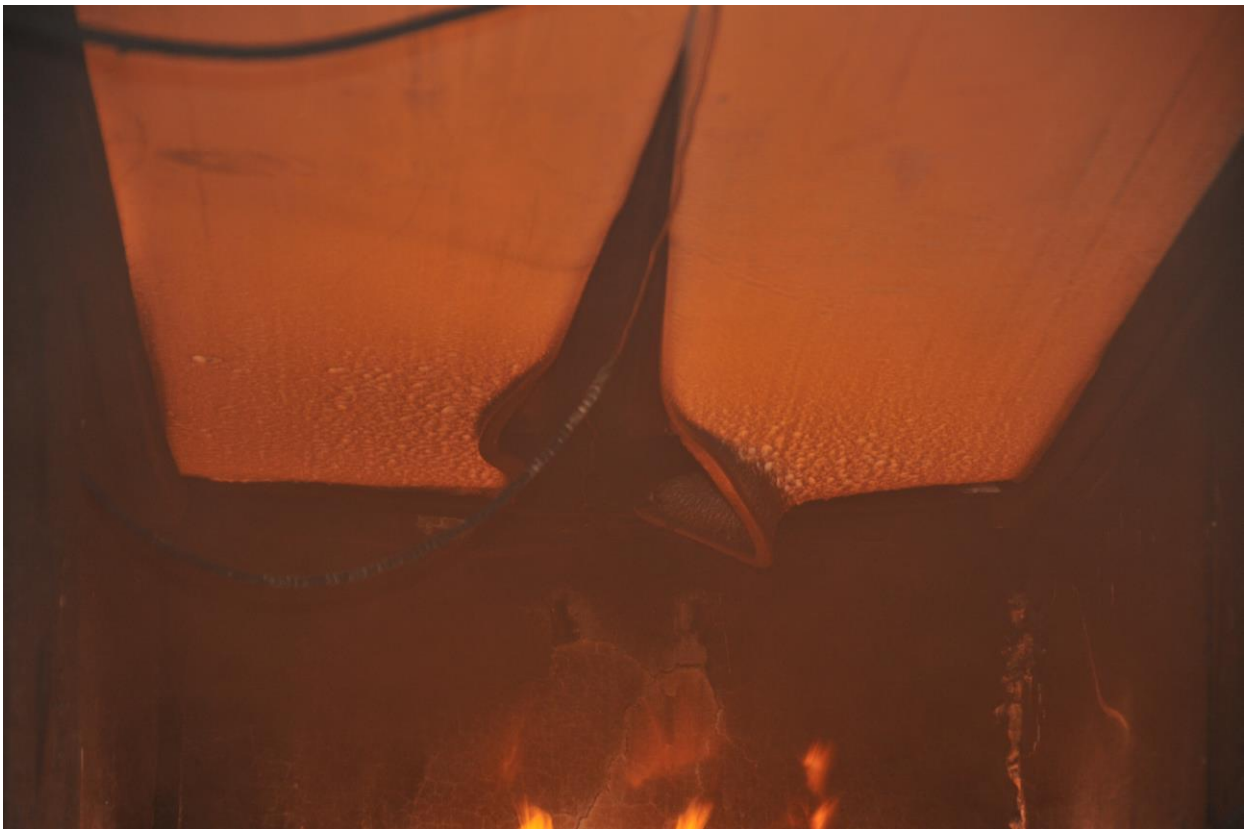

Figure 4.2.5.3: Molten material at joint starts to drape

Figure 4.2.5.4: Molten material flowing out above Fire Source – Joint separated up to 2 meter mark

Figure 4.2.5.5: Material draping and dropping out up to 2 meter mark

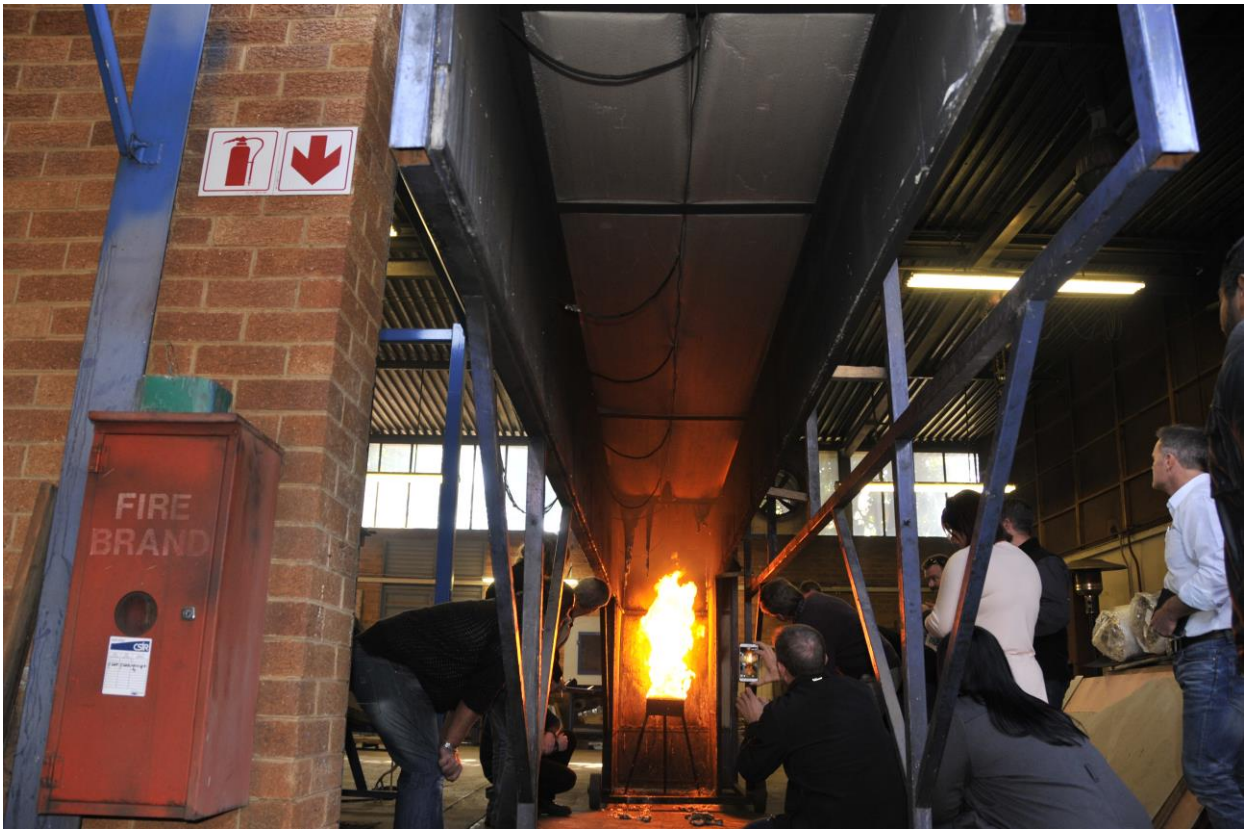

Figure 4.2.5.6: Separation of joint reaches full length (0 to 7 meters)

Figure 4.2.5.7: All material up to 2 meter mark dropped out

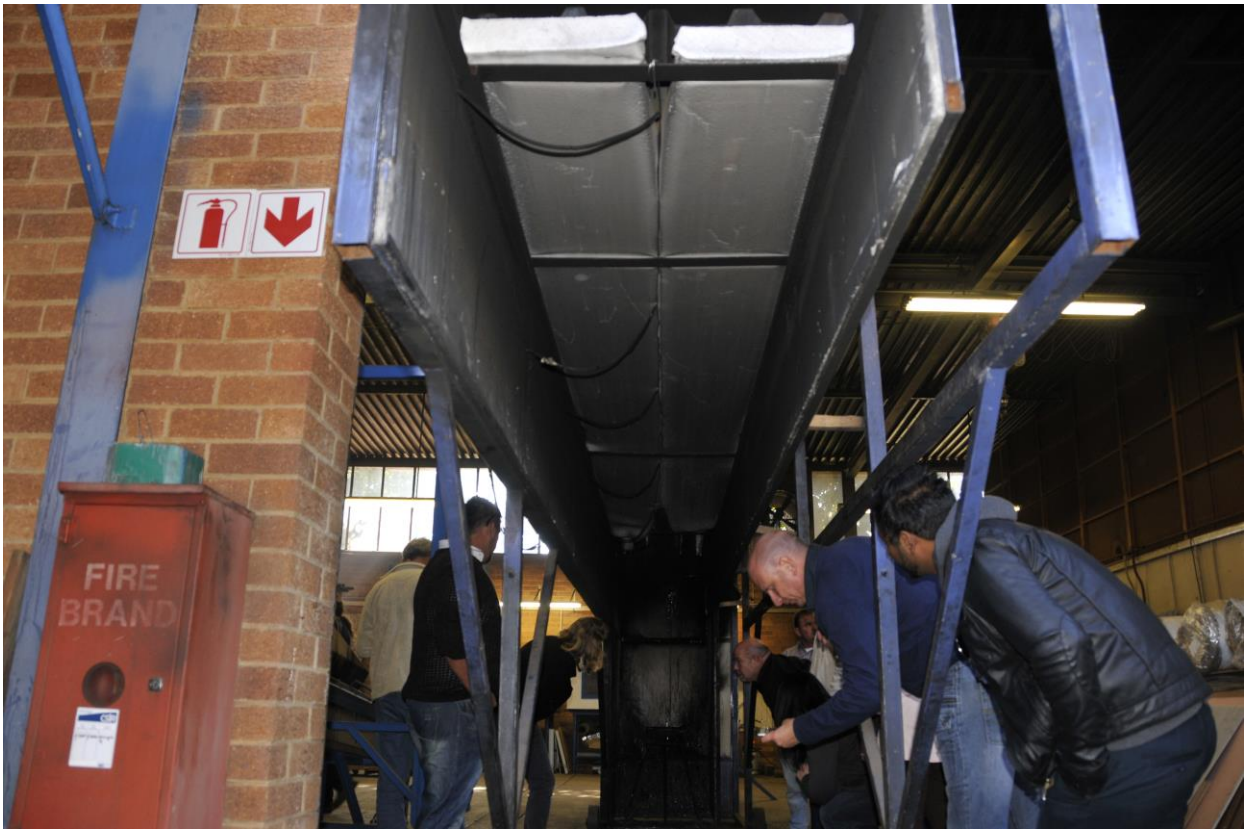

*Figure 4.2.5.8: Test specimen at conclusion of **SANS 10177 – 10** test*

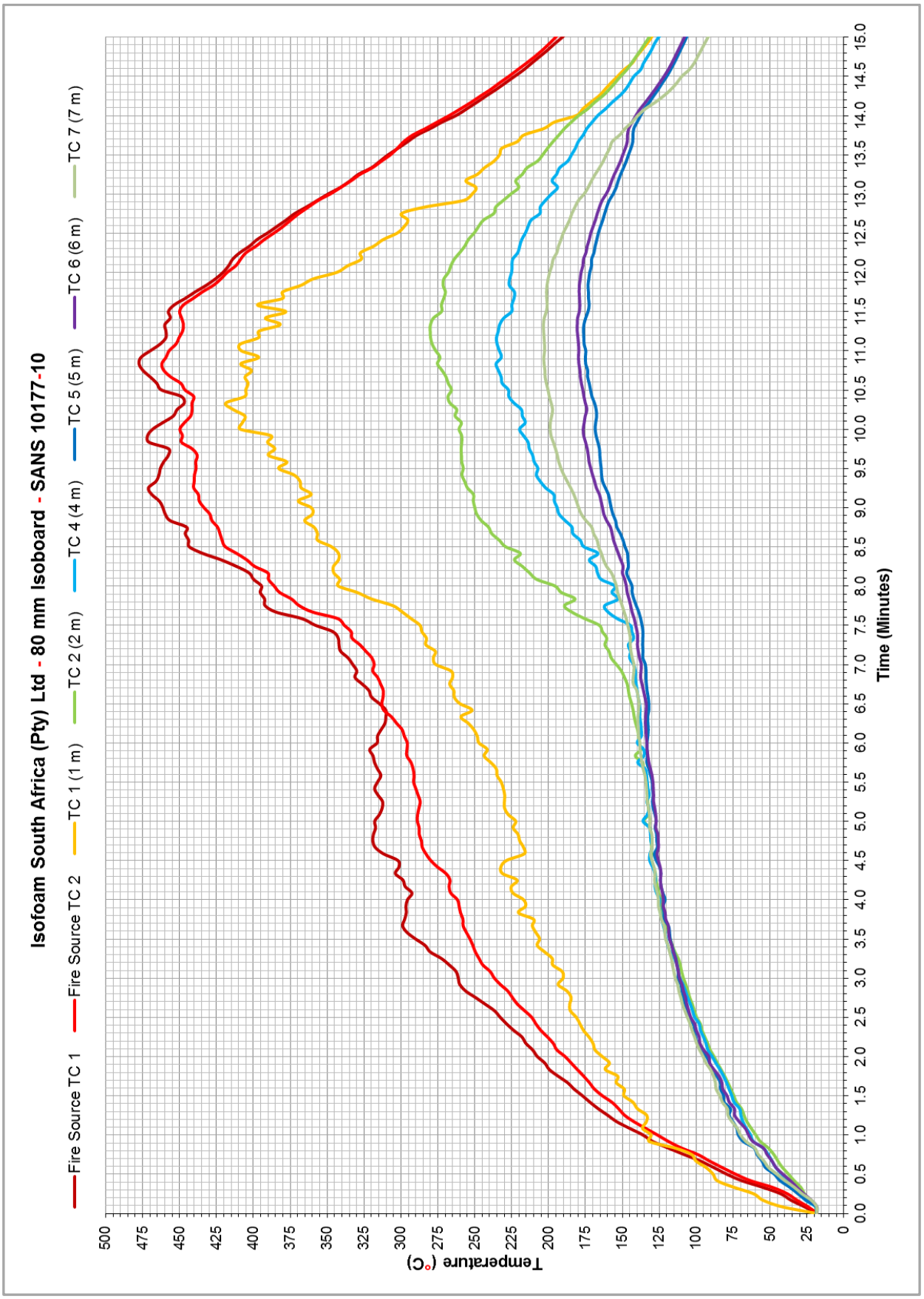

*Figure 4.2.5.9: Temperatures recorded during the **SANS 10177 – Part 10** test*

4.3. SANS 10177 – PART 11, HORIZONTAL (CLASSIFICATION)

Observations made during the **SANS 10177-11** test are depicted in Table 4.3.1 below:

Isofoam South Africa (Pty) Ltd – 80 mm IsoBoard	
OBSERVATIONS MADE DURING THE **SANS 10177 – PART 11** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
03:35	Shrinkage occurs rounding edges of joint
04:55	Surface coagulation started on material above Fire Source
05:50	Joints start shrinking in 2nd bay (2 to 4 meters)
07:05	Discoloration/Charring of joint above Fire Source
08:00	Joint completely separates above the Fire Source
08:45	Sample starts softening and flowing above Fire Source
09:15	Molten debris starts dropping out
12:05	Boards in 2nd bay (2 to 4 meters) starting to drape
13:25	Fire Source (Crib) starting to collapse
14:40	Joints up to 4th bay (0 to 8 meters) starts to shrink
26:00	Fire Source (Crib) consumed – End of Test –
Note(s):	No ignition occurred during the test

*Table 4.3.1: Observations recorded during the **SANS 10177-11** test*

The test installation in the **SANS 10177-11** facility prior to ignition of the Fire Source (Crib) and after the test was concluded is shown in Figure 4.3.1 and 4.3.10 respectively. The temperatures recorded by the thermocouples (TC) during the test are depicted graphically in Figures 4.3.11 and 4.3.12.

*Figure 4.3.1: The **SANS 10177-11** test installation prior to ignition of the Fire Source*

Figure 4.3.2: Edges of joints above Fire Source becomes rounded due to shrinkage

Figure 4.3.3: Surface coagulation visible and joints separating due to shrinkage

Figure 4.3.4: Molten material above Fire Source starts to flow

Figure 4.3.5: Material above Fire Source draping and dropping out

Figure 4.3.6: Boards in 2nd bay (2 to 4 meters) starts to drape

Figure 4.3.7: Fire Source (Crib) starting to collapse – Boards draping up to 3 meter mark

Figure 4.3.8: Fire Source (Crib) completely collapsed – Boards draping up to 4 meter mark

Figure 4.3.9: Material draping close to sprinkler head and over sprinkler pipes in rear

*Figure 4.3.10: Test installation at conclusion of **SANS 10177 – Part 11 (Horizontal)** test*

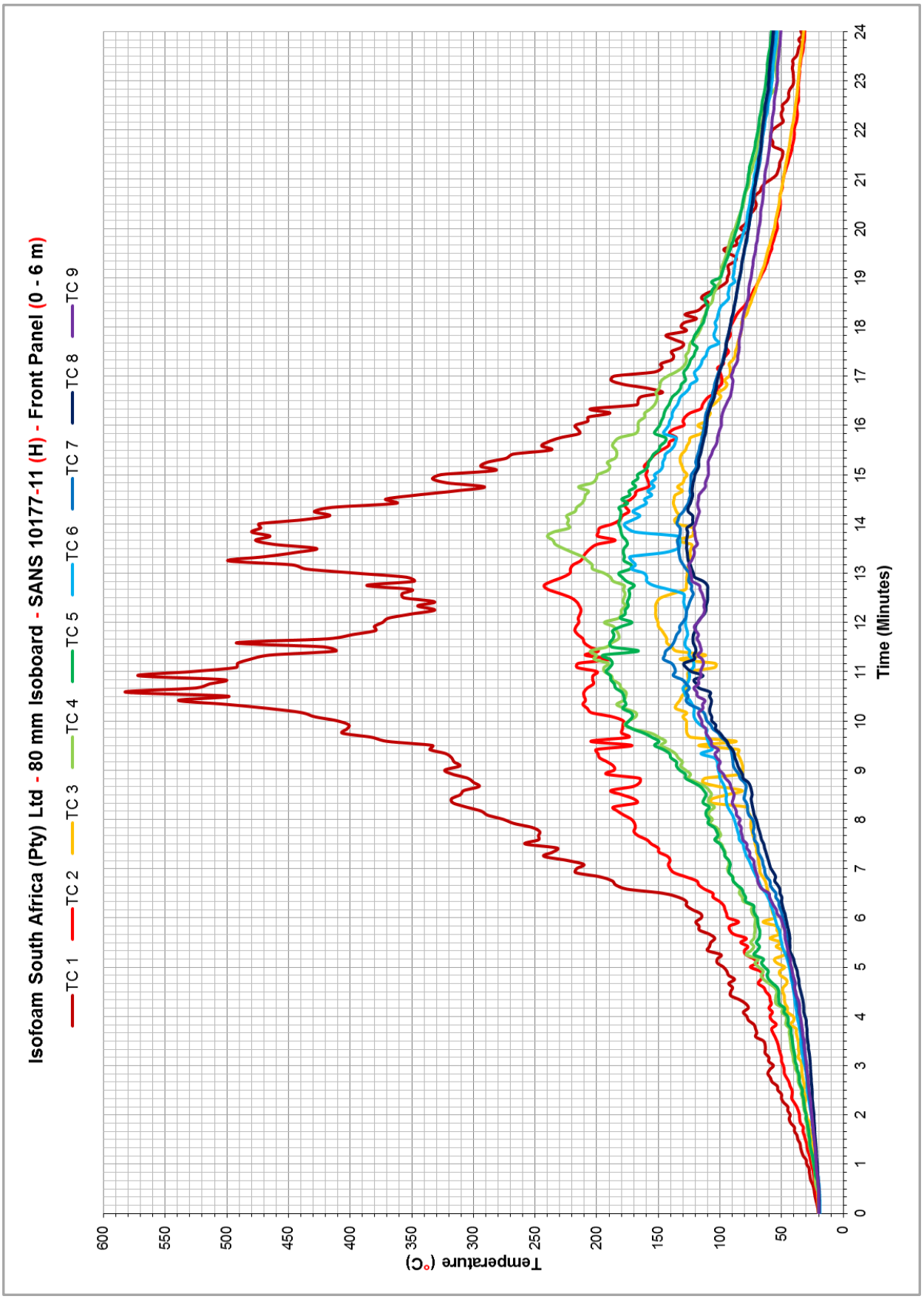

*Figure 4.3.11: Temperatures recorded on the front sample frame during the **SANS 10177-11** test*

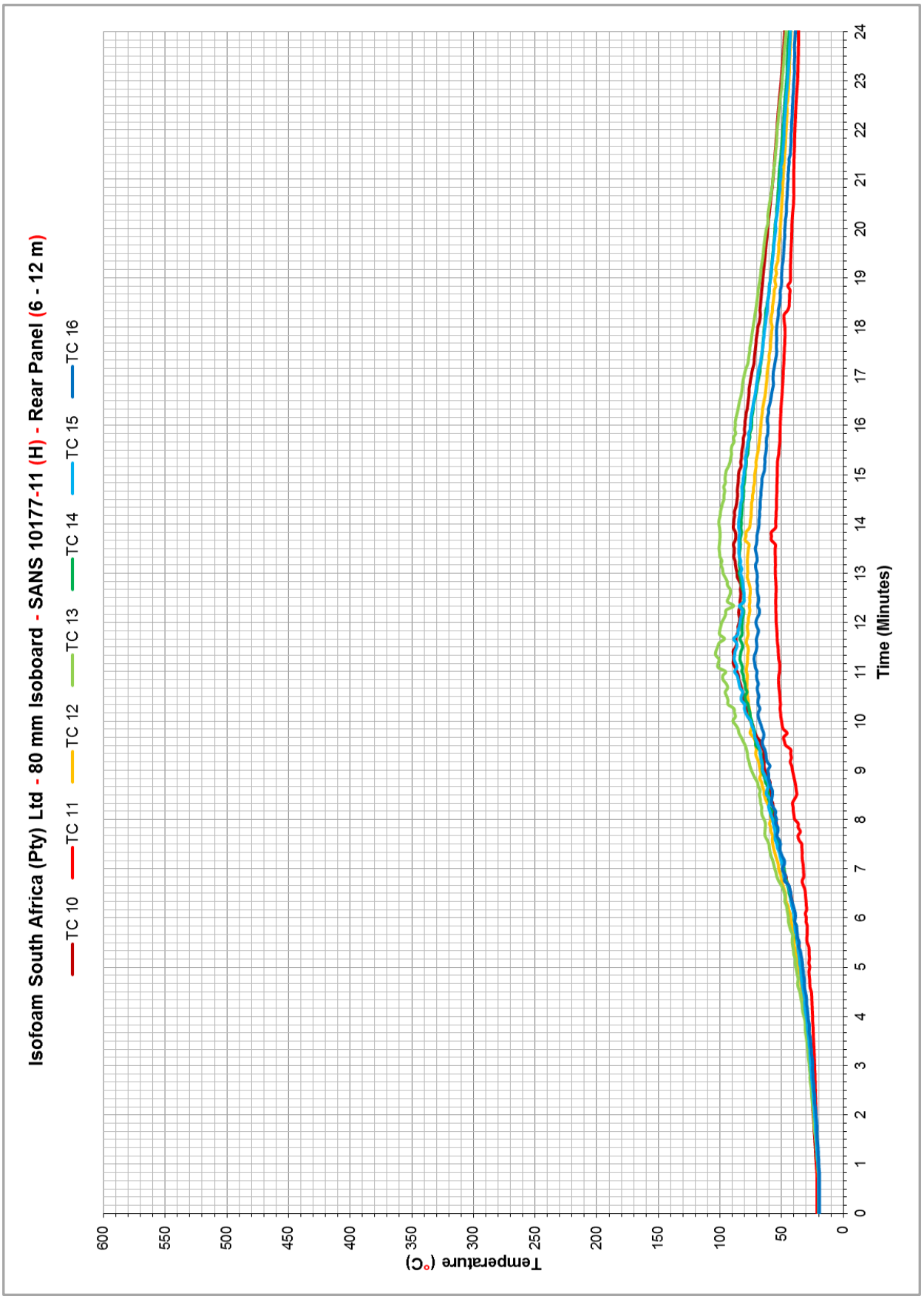

*Figure 4.3.12: Temperatures recorded on the rear sample frame during the **SANS 10177-11** test*

4.4. SANS 10177 – PART 11, VERTICAL (CLASSIFICATION)

Observations made during the **SANS 10177-11** test are depicted in Table 4.4.1 below:

Isofoam South Africa (Pty) Ltd – 80 mm IsoBoard	
OBSERVATIONS MADE DURING THE **SANS 10177 – PART 11 (VERTICAL)** TEST	
TIME	**OBSERVATION**
00:00	– Test Started –
01:50	Bubbles forming on surface and shrinking started
03:30	Discoloration of panel surface started
05:15	Coagulation of material exposing cladding
06:10	Molten material start to flow down
06:50	Heat exposure visible on horizontal roof cladding
09:30	Horizontal roof cladding above left crib starting to deform
12:00	Left crib starting to collapse
13:50	Right crib starting to collapse
15:15	Right crib collapses
18:25	Left crib collapses – End of Test –
Note(s):	No ignition or burning of the sample occurred during the entire test period

*Table 4.4.1: Observations recorded during the **SANS 10177-11** test*

The test installation in the **SANS 10177-11** facility prior to ignition of the two Fire Source cribs and after the test was concluded is shown in Figure 4.1.1 and 4.1.8 respectively.

Figure 4.4.1: Test installation prior to ignition of the two Fire Source cribs

Figure 4.4.2: Material melting and bubble forming behind Crib

Figure 4.4.3: Coagulation of material behind Cribs

Figure 4.4.4: Coagulation of material exposing sheeting

Figure 4.4.5: Molten material starting to flow down

Figure 4.4.6: Heat damage visible on horizontally installed material

Figure 4.4.7: Cribs starting to collapse – No ignition occurred

*Figure 4.4.8: Test installation after the **SANS 10177-11 (V)** test was concluded*

FIRELAB

5. DISCUSSION OF RESULTS

The product classification when tested in accordance with the **SANS 10177 – Part 5** test protocol is:

- **IsoBoard (25 – 80 mm)** » **B (Combustible)**

The provisional classification for the various thicknesses when tested in accordance with **SANS 10177 – Part 10** is:

- **25 mm IsoBoard** » **B/ B1/ 2**
- **30 mm IsoBoard** » **B/ B1/ 2**
- **40 mm IsoBoard** » **B/ B1/ 2**
- **50 mm IsoBoard** » **B/ B1/ 2**
- **80 mm IsoBoard** » **B/ B1/ 2**

As a result of the outcome obtained from the **SANS 10177 – Part 10** tests it was decided to use the worst case scenario (most material), the 80 mm-thick, **IsoBoard** panels for evaluation in the **SANS 10177 – Part 11, Horizontal and Vertical**, tests to be sufficiently representative of all lesser thicknesses within the product range.

The classification in terms of **SANS 428** for the 80 mm-thick **IsoBoard** when tested in accordance with the **SANS 10177 – Part 11, Horizontal (H) and Vertical (V)**, test protocols are:

- **80 mm IsoBoard** » **B/ B1/ 2/ H & V (SP and USP)**

6. CONCLUSIONS

The **IsoBoard** product range, which includes all thicknesses from 25 mm up to 80 mm, as supplied by **Isofoam South Africa (Pty) Ltd** is classified as follows in terms of **SANS 428**:

Classification according to **SANS 428**:

- **IsoBoard (25 – 80 mm)** » **B/ B1/ 2/ H & V (SP and USP)**

The above results does not relate to fire resistance. In instances where fire resistance is a requirement, this property needs to be determined in terms of **SANS 10177-2**.

FIRELAB

ANNEXURE "A"

– Company Information –	FIRELAB
Company Name:	Isofoam South Africa (Pty) Ltd.
Company Registration Nr.:	95/03958/07
Company VAT Nr.:	4140154644
Core Business Activities:	Manufacturing & Sales
Physical Address:	23 Kenwill Drive, Okavango Park, Brackenfell, 7560
Postal Address:	P O Box 1002 Cape Gate 7562
Contact details	
Telephone number:	021 983-1140
Facsimile number:	021 981-6099
Cellphone number:	082 815 0994 / 082 347 0186
Email address:	gm@isoboard.com
Name of Contact Person	
Technical:	Conrad Smith / Mark Russell
Financial:	Beth Hewitt-Coleman

– Test information & Sample/Product Description –

Type of Test:	
Sample/Product Name:	
Manufacturing Date:	
Batch/Product Number:	
Sample/Product Description: *(Short description of sample or product submitted for testing)*	

ISOFOAM

Requisition GTN-SAM

Order No (FGR): 700320
Date : 03/06/2015
Page : 1

ISOBOARD

Item	Wh	Brd Qty	LenOrd	LenChg	W(mm)	T(mm)	m2	m3
ISOBOARD	GTN-FGR	2	8.00	8.00	600	25	9.60	0.240
ISOBOARD	GTN-FGR	2	8.00	8.00	600	30	9.60	0.290
ISOBOARD	GTN-FGR	2	8.00	8.00	600	40	9.60	0.380
ISOBOARD	GTN-FGR	2	8.00	8.00	600	50	9.60	0.480
ISOBOARD TI	GTN-FGR	2	8.00	8.00	600	80	9.60	0.770
ISOBOARD TI	GTN-FGR	30	6.00	6.00	600	80	108.00	8.640
ISOBOARD TI	GTN-FGR	10	4.00	4.00	600	80	24.00	1.920
							180.00	12.72

Client Details:

Client Name: CSIR
Order No:
Tel No: 082 305 8559
Fax No:
Contact Name: KOBUS STRYDOM

Delivery Details:

Required On: 2015/06/03 12:00:00
Del Method: COLLECT
From/To:

35 Venturie Crescent, Hennops Park
Centurion
Pretoria

RDC Details

Phone: +27 (012) 653 8204
Fax: +21 (012) 653 0282
Email: northsales@isoboard.com
Consultant: Gauteng Sales

35 Venturie Crescent
Hennops Park
Centurion

Generated by: Mari-Louise Ha

Other Requirements:

Short Edge: SE
Long Edge: TG
Finish: Plain
Laminated: N
Application: OTH

Comments:

Based On Sales Quotations 529758.