



Fire resistance test report

20 May 2025

28 Chardonnay Street
Saxenburg Park 1
Blackheath, Cape Town
info@ignistesting.co.za
021 905 0322

CLIENT INFORMATION

Client Solid Ceiling Products (Pty) Ltd
Company representative Tristan Spies
Address Plot 79, Beyers Naude Drive, Honeydew, Johannesburg, Gauteng, 2040
Contact number 011 7943076
Email tristan@solidceilings.co.za



TEST INFORMATION

Specification	Description
Test date	2025-05-15
Test number	2025-05-15 Solid Cape
Place of test	Cape Town
Test description	Wall panel with joint
Test sample type	Panel
Direction	Symmetrical
Standard	SANS 10177-2:2005
Class required	60 minutes
Class achieved	60 minutes

REPORT COMPILATION

Author PJ Gräbe (Pr Tech Mech Eng 200870007)
Assistant C Kuhn (Chem) Eng(SU)
Approver DJ Streicher (Pr Eng 880107) MSc.(Civ)Eng (UCT)

TEST REPORT SUMMARY

Specification	Description
TEST CONFIRMATION	
Client	Solid Ceiling Products (Pty) Ltd
Test sample type	Panel
Test description	Wall panel with joint
Frame material	Mild steel
Project usage	Commercial
Substrate	Double maxi brick wall
Test number	2025-05-15 Solid Cape
Test facility	Ignis Fire Testing Cape Town
Class required	60 minutes
Class achieved	60 minutes
O/A dimensions	2200 mm x 2400 mm
O/A thickness	95 mm
CRITERIA	
Standard	SANS 10177-2:2005
Direction	Symmetrical
Exclusions	None
Time Class	60 minutes
Stability	60 minutes
Integrity	60 minutes
Insulation	60 minutes
AUTHORISATION	
Date Authorised	2025-05-20
Authorised By	DJ Streicher (Pr Eng 880107) MSc.(Civ)Eng (UCT)
Assistants	C Kuhn (Chem) Eng(SU)
Conditional Recommendation	None
Report Expiry Date	2030-05-15



This report is only valid for the element or assembly as tested and described in this report. This report will only be valid for a period of five years or until the relevant standard is changed from the date of issue. This test report will only be valid until the expiry date. The contents of this report are the intellectual property of Ignis Testing (Proprietary) Limited and are protected by copyright. This report may not be copied, stored, retrieved or in any way reproduced without the express written permission of Ignis Testing (Proprietary) Limited. Breach of copyright is a serious offence and may lead to litigation.

Contents

1 Test requirements and procedures 4

2 Test sample description and measurements 4

3 Drawings 5

4 Images 7

5 Compliances 10

6 Discussion of observations and results 13

7 Conclusion 13

A Temperature readings 15

B Furnace temperature and energy analysis 16

C Furnace temperature curve 17

D Differential pressures 18

E Gas content 19

List of Tables

1 Test sample description and measurements 4

2 Compliance SANS 10177-2:2005 Requirements (FR test for building elements) 10

3 Insulation limits 15

4 Time vs temperature unexposed surface 15

5 Time vs temperature 15

6 Furnace temperature analysis 16

7 Furnace thermocouple positions 16

8 Burner energy analysis 16

9 Amendments 20

10 Attendance register 22

List of Figures

1 Technical drawing as provided by the client 5

2 Technical drawing as provided by the client 6

3 View of unexposed surface before the fire test 7

4 Exposed surface before the fire test with K-type thermocouples 7

5 Un-exposed surface after the start of the test 8

6 Exposed surface 5 minutes after the start of the test 8

This report is only valid for the element or assembly as tested and described in this report. This report will only be valid for a period of five years or until the relevant standard is changed from the date of issue. This test report will only be valid until the expiry date. The contents of this report are the intellectual property of Ignis Testing (Proprietary) Limited and are protected by copyright. This report may not be copied, stored, retrieved or in any way reproduced without the express written permission of Ignis Testing (Proprietary) Limited. Breach of copyright is a serious offence and may lead to litigation.

Ignis Certificate ID 2c113 2025-05-20 13:08

7	Un-exposed surface 15 minutes after the start of the test	8
8	Exposed surface with joint opening up 22 minutes after the start of the test	8
9	28 minutes after the start of the test - horizontal crack forming on exposed surface . . .	9
10	Horizontal crack 34 minutes after the start of the test	9
11	Vertical crack on un-exposed surface 51 minutes after the start of the test	9
12	Un- exposed surface after 60 minutes	9
13	Furnace time vs temperature curve	17
14	Top, middle and bottom differential pressures	18
15	Gas content	19

1 Test requirements and procedures

- 1.1 The specific standard against which this test was performed and reported is SANS 10177-2:2005; Fire testing of materials, components and elements used in buildings.
- 1.2 The furnace temperature was controlled according to SANS 10177-2 within the tolerances.
- 1.3 The temperature in the furnace is controlled by the average of ten plate K-type thermocouples. The algorithm to calculate the average temperature makes provision to exclude any thermocouple if it can be classified as an outlier or if it malfunctions. In this case, the average temperature will be determined by using the average of the remaining thermocouples.
- 1.4 Photos was taken as necessary with the aid of still photography and action cameras to capture smoke emission, flaming and time of flaming.

2 Test sample description and measurements

Table 1: Test sample description and measurements

Item	Description	Notes	Inspect
Assembly			Yes
Class	60 minutes		Yes
Type	Wall panel with joint		Yes
Nominal size	2200 mm x 2400 mm		Yes
Substrate	Double maxi brick wall		Yes
Heat direction	Symmetrical	See SANS 10177-2 cl 3.5.1 (b)	Yes
Frame			Yes
Material	Mild steel		Yes
O/A dimensions	2200 mm x 2400 mm		Yes
Panel			Yes
Density	10.5 kg/m ² for 15 mm		Yes
Skins	15 mm Solid fireproof drywall boards screwed to 64 mm steel studs.		Yes

3 Drawings

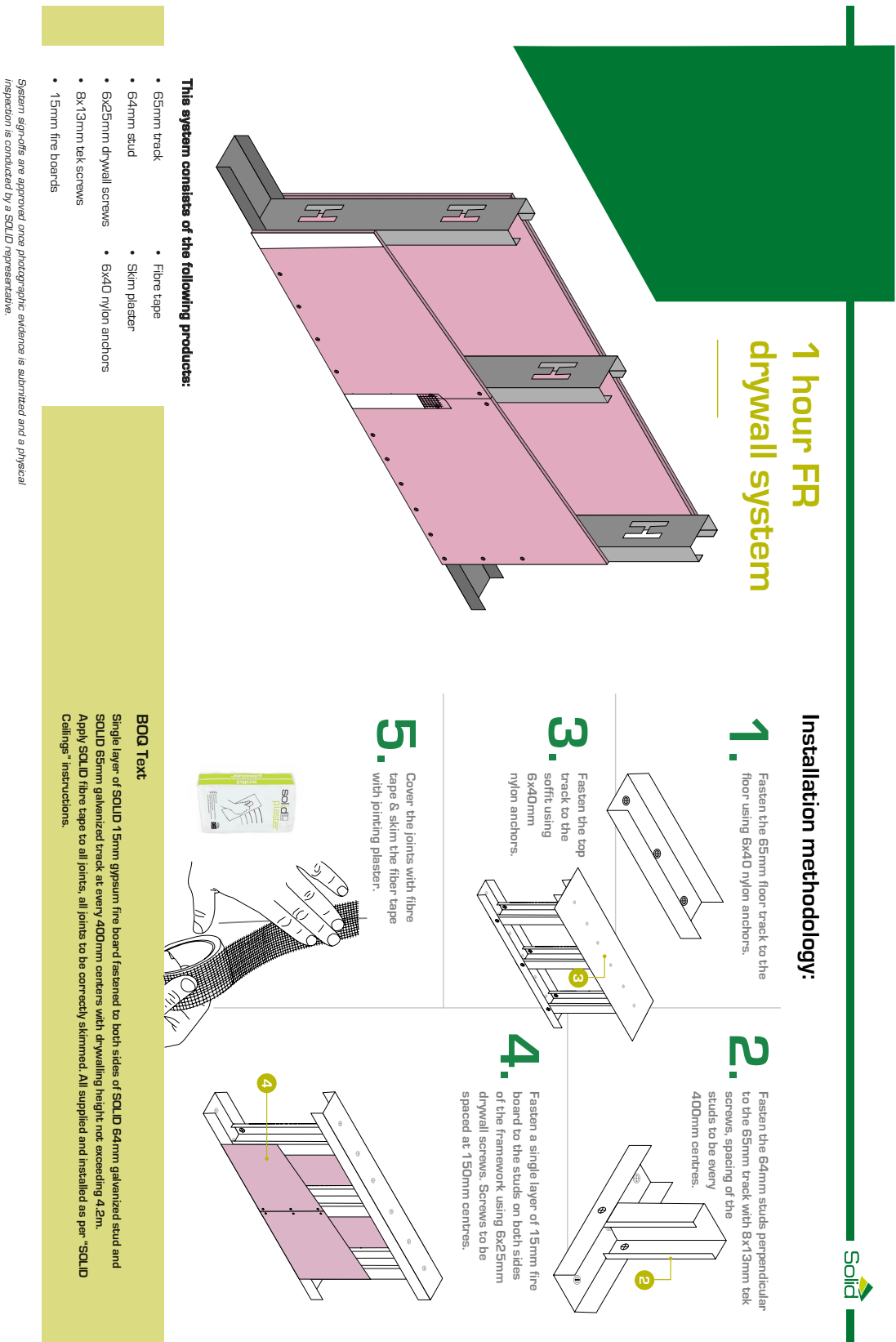


Figure 1: Technical drawing as provided by the client.

Solid Ceilings Fire Rated Systems

Solid Ceilings 1 hour fire rated 64mm Drywalling system

60-minute fire rated solid ceilings drywalling system comprises of 1*15mm Solid fireproof boards securely fastened through each board to each side of the framework by 6*25 drywall screws. 64mm Solid Ceilings stud, 0.4mm thickness fitted into the top and bottom of a Solid Ceilings 65mm track by 8*13 wafer head tek screws at 400 centers, track fastened by fisher plugs to the floor and ceiling. Solid Fibre tape should be applied to all joints. All joints to be correctly skimmed

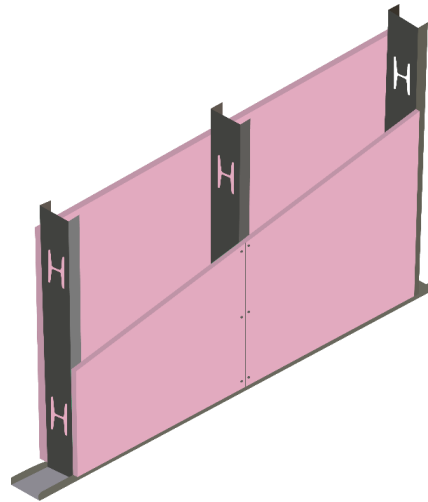


Figure 2: Technical drawing as provided by the client.

4 Images



Figure 3: View of unexposed surface before the fire test.



Figure 4: Exposed surface before the fire test with K-type thermocouples.



Figure 5: Un-exposed surface after the start of the test.



Figure 6: Exposed surface 5 minutes after the start of the test.



Figure 7: Un-exposed surface 15 minutes after the start of the test.

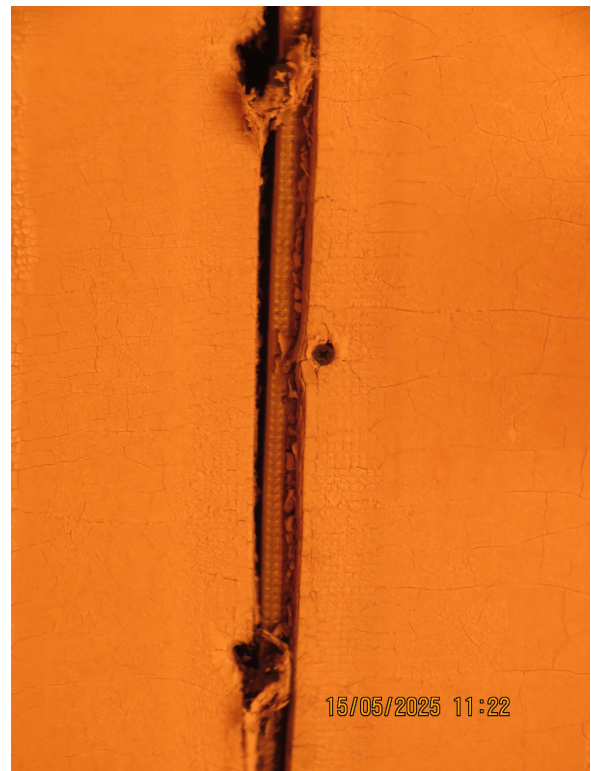


Figure 8: Exposed surface with joint opening up 22 minutes after the start of the test.

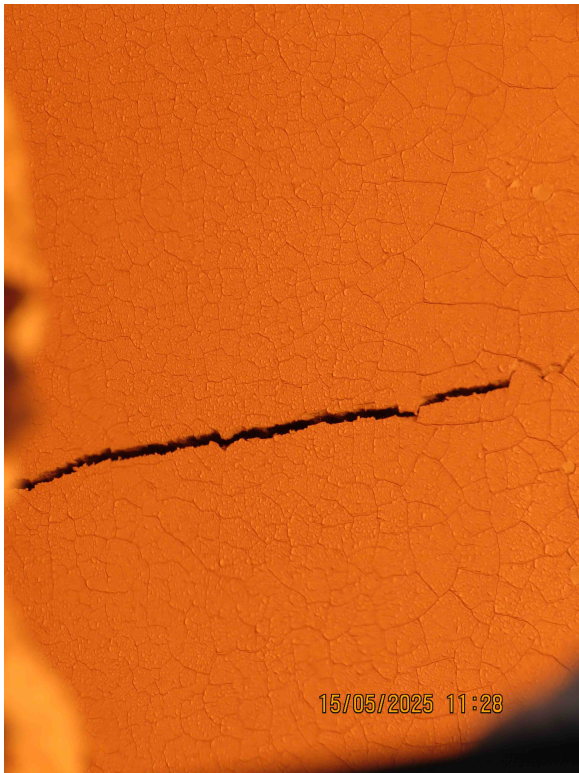


Figure 9: 28 minutes after the start of the test - horizontal crack forming on exposed surface .



Figure 10: Horizontal crack 34 minutes after the start of the test.



Figure 11: Vertical crack on un-exposed surface 51 minutes after the start of the test.



Figure 12: Un- exposed surface after 60 minutes.

5 Compliances

Table 2: Compliance SANS 10177-2:2005 Requirements (FR test for building elements)

Clause	Description	Result	Compliant
1.1 (g)	Test panel for stability, integrity & insulation	Test against SANS 10177:2005 requirements	Yes
2.1	Furnace	Adequate size and performance to conduct test	Yes
2.2	Standard heating conditions	Control temp according to standard time-temperature curve SANS 1017-2 cl 2.2.1	Yes
2.2.2	Standard time-temperature heating curve	Control with SCADA system & HMI	Yes
2.3.1	Measurement of furnace temperature	Measure every 5s average of 10 thermocouples symmetrically placed.	Yes
2.3.1	Variation of temperature	The temperature usually takes some time, approx. 5 min to settle, except when surface skins ignite, a spike in temperature will be noticed	Yes
2.3.2	Number of thermocouples (minimum of 5)	10 thermocouples are used. Random checks are done with a calibrated measuring device to confirm tolerances.	Yes
2.3.3	High-temperature thermocouples and placement	10x1200mm type stainless steel K-type thermocouples are used.	Yes
2.4	Tolerance of furnace temperature	The SCADA measures T0 @t to establish the start and the initial temperatures.	Yes
2.5	Measurement of surface temperatures unexposed surface	Use a thermal resistant cloth to cover thermocouples attached to the surface	No
3.1	Dimensions	The full-size specimen is tested in a 2.2 x 2.4 m plan area	Yes
3.2	Construction	Install specimen as close as possible to in-service conditions and material	Yes
3.3	Conditioning	Tested 3 days after installation	No
3.4	Application of external forces	Not requested	Yes
3.5.1	Exposure positioning of the specimen	Heat exposure to full exposed surface area measured by thermocouples. NB. The sponsor must state the direction of resistance if applicable.	Yes

Continued on next page

Table 2: Compliance SANS 10177-2:2005 Requirements (FR test for building elements)

Clause	Description	Result	Compliant
3.5.2	Attachment of thermocouples	Place thermocouples as per SANS 10177-2 cl 3.5.2) directive. Temperatures, e.g., On joints, are measured only for info.	Yes
4.1	Heating	The furnace temperature is operated by SCADA & PID control system once start is triggered supported by HMI	Yes
4.2.1	Stability observation	Observe deformation and time of collapse or failure	Yes
4.2.2	Integrity observation	Check for cracks, holes or openings through which flames or gasses can escape.	Yes
4.2.3	Insulation measurements	SCADA measures temperatures to give warnings once limits are exceeded. Temperatures are also confirmed.	Yes
4.2.4	Additional observations	Continuous video recording of the unexposed surface is done with action cameras to monitor flame ignition, smoke emissions, and discolouring. Other observations include frame performance, hinge temperatures, gap movements, intumescent performance etc.	Yes
4.3.1	Duration of test	The time when stability and integrity failure occurred will be noted and recorded. Insulation performance can be obtained from SCADA recordings and IR observations. Some failures could also be captured from video recordings.	Yes
4.3.2	Distortion stability measurement	It is essential to measure the distortion just before the test is terminated because extreme warping occurs quickly after the test is terminated and the specimen rapidly cools down. Photos are taken to estimate distortion out of frame because very difficult to measure at the time due to flaming or excessive heat.	Yes
5.1	Fire resistance	Measurements are taken every 5s, recorded and saved with the SCADA on an EXCEL spreadsheet against the time-lapse of the test from time to.	Yes

Continued on next page

Table 2: Compliance SANS 10177-2:2005 Requirements (FR test for building elements)

Clause	Description	Result	Compliant
5.2	Criteria of failure	Failure will be recorded as per the requirements and the reason for failure will be stipulated.	Yes

6 Discussion of observations and results

- 6.1 The test was performed according to the set standards for testing elements with measurements captured as prescribed by the standards.
- 6.2 All the thermocouples were calibrated at ambient temperature before the start of the test. All the thermocouples were within plus/minus two degrees and referenced to the calibrated test device within plus/minus 2 degrees Celsius. When furnace thermocouples go astray, they will be discarded from the average temperature calculation and omitted during the control process of the furnace temperature.
- 6.3 The surface temperatures were measured at the prescribed positions on the panel.
- 6.4 The panel assembly appeared well prepared and the tolerances well controlled.
- 6.5 The panel remained very stable with minimal deflection.
- 6.6 The unexposed surface reached a maximum temperature of 227.5°C and average temperature of 166.1°C after 60 minutes. This is above the insulation failure criteria limit of 60 minutes.
- 6.7 Only 2 out of 10 thermocouples registered temperatures over the limit and these thermocouples were close to the metal studs which affected the temperature due to conduction. If the 2 outlier high readings are discarded, the insulation values of the remaining 8 thermocouples are well within specified limits.
- 6.8 The panel assembly was submitted to pass a 60 minutes classification according to SANS 10177-2:2005. The panel passed the criteria for stability at 60 minutes, integrity at 60 minutes and insulation at 60 minutes for a 60 minutes panel.

7 Conclusion

We hereby conclude that the dry wall assembly submitted as per the drawings for testing can be classified according to SANS 10177-2:2005 as:

Fire Resistance of **60 minutes**:

Stability 60 minutes, Integrity 60 minutes, Insulation 60 minutes

Declaration

I, Dirk Johannes Streicher ID 590115 5011 087, hereby declare that I am registered with ECSA as a Professional Engineer (880107) and that I have acquainted myself with the content of the relevant codes, performed and witnessed the above test, applied my knowledge and mind to the process and that the results are accurate and true. I also declare that I have no knowledge in my capacity as a competent Professional Engineer that there is any other legal requirement w.r.t. approval of the compliance of the submitted test sample to the relevant codes.

Signed at Ignis Fire Testing Laboratory Cape Town on 20 May 2025.



DJ Streicher
(Pr Eng 880107) MSc.(Civ)Eng (UCT)

Indemnity

Ignis Testing's test report serves to confirm the testing of the client's sample furnished at the date of testing. Ignis Testing takes no responsibility for any information furnished therein which may cause any damage or harm whatsoever. It remains the responsibility of the client and the end-user to confirm that the sample tested is the same quality and design supplied to the end-user and to their own reasonable satisfaction. By making use of the content contained in the testing report, be it an indivisible reliance, the client and or recipient of the report hereby irrevocably indemnify and hold harmless Ignis Testing, its directors, representatives and employees, against all and any actions, suits, proceedings, claims, demands, costs and expenses of whatsoever nature and howsoever incurred which may be taken or made against them or be incurred or become payable by them arising out of the report. Ignis Testing's rights shall always remain strictly reserved to substitute any information contained in its testing report should Ignis Testing reasonably become aware of any changes to or of the client's product and/or sample after testing. The client must conduct a further resistance test, at its own cost, should the design and quality of the product differ from the sample submitted for testing or if the relevant standards undergo any changes. The report is solely to be used by the recipient addressed therein and may not be amended and/or reproduced without the prior written consent of Ignis Testing, for which consent may be withheld for any reason whatsoever.

A Temperature readings

Table 3: Insulation limits.

Limit on the un-exposed surface	Temperature (°C)	Description
Initial temperature	24.3	Ambient temperature measured
Max allowable temperature	204.3	180 + 24.3
Average allowable temperature	164.3	140 + 24.3

Table 4: Time vs temperature unexposed surface.

Time (min)	Average (°C)	Max (°C)
0	21.6	23.1
5	32.3	37.9
10	53.0	62.5
15	59.2	65.7
20	62.1	68.3
25	73.0	77.9
30	76.6	80.4
35	80.3	85.1
40	93.3	103.1
45	102.7	112.4
50	112.6	121.7
55	132.0	169.7
60	166.1	227.5
Max	166.1	227.5

Table 5: Time vs temperature.

Time (min)	Furnace Temp (°C)	Left top (left leaf)	Centre (left leaf)	Left bot (left leaf)
0	20	21.4	22.2	19.4
5	576	28.5	34.3	24.3
10	678	48.7	56.2	43
15	739	56.4	62.4	52.7
20	781	58.9	62.7	57
25	815	71.6	72.2	67
30	842	78	73.9	76.5
35	865	81.2	75.6	79.5
40	885	83.6	90.8	80.5
45	902	97.4	99.3	92.7
50	918	110.2	107.6	107.3
55	932	116.1	117.1	114.6
60	945	133.4	155.9	128.2
Max	945	133.4	155.9	128.2

B Furnace temperature and energy analysis

Table 6: Furnace temperature analysis.

Variable	Value	Allowable
Average	3.67	-
Average Hi all data (Above ISO curve)	9	-
Average only of max deviation above curve	19.7	-
Average Lo all data (Below ISO curve)	-6.7	-
Average only of min deviation below curve	-6.3	-
Std Deviation of all deviations (+ve & -ve)	9.7	-
Median difference	6.8	-
No of readings (data points)	601	-
Max difference Hi	43	100
Max difference Lo	-26	-100
Highest TC	L_3	-
Lowest TC	R_1	-
Final measured Energy deviation from target	-0.48%	+/- 2.5 %

Table 7: Furnace thermocouple positions.

Positions of TC's	LHS	RHS
Top	L_1	R_1
Between Top/Middle	L_2	R_2
Middle	L_3	R_3
Between Middle/Bottom	L_4	R_4
Bottom	L_5	R_5

Table 8: Burner energy analysis.

Burner energy analysis	Value	Unit
Min capacity	200.0	kW
Max Capacity	600.0	kW
Average throttle opening	21.1	%
Average Power delivery	376.6	kW
Total running time	71.5	min
Total energy delivered	1401.0	MJ
Diesel consumed	29.3	liter
Specific fuel energy	47.9	MJ/l

C Furnace temperature curve

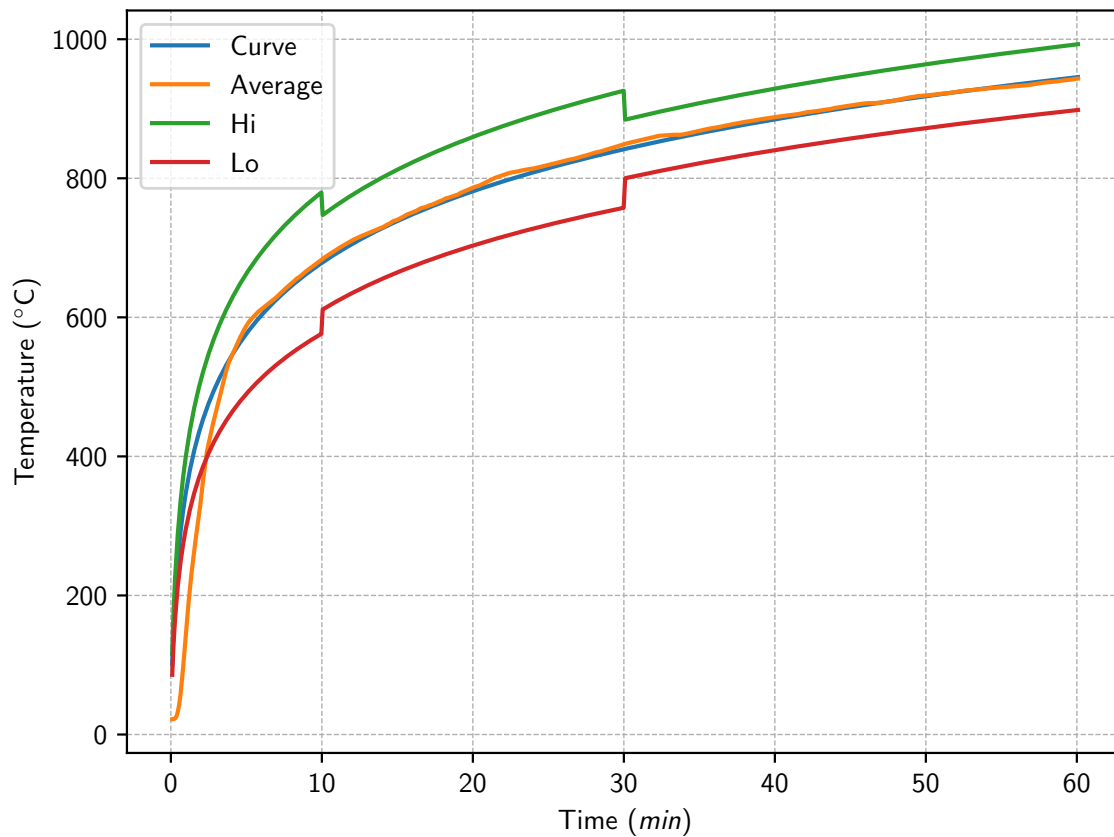


Figure 13: Furnace time vs temperature curve.

NOTES:

1. The average temperature is obtained by 10 × K-type thermocouples placed symmetrically behind the test specimen.
2. The upper and lower tolerance envelope is according to SANS 10177-2.
3. The test was terminated after 60 minutes.

D Differential pressures

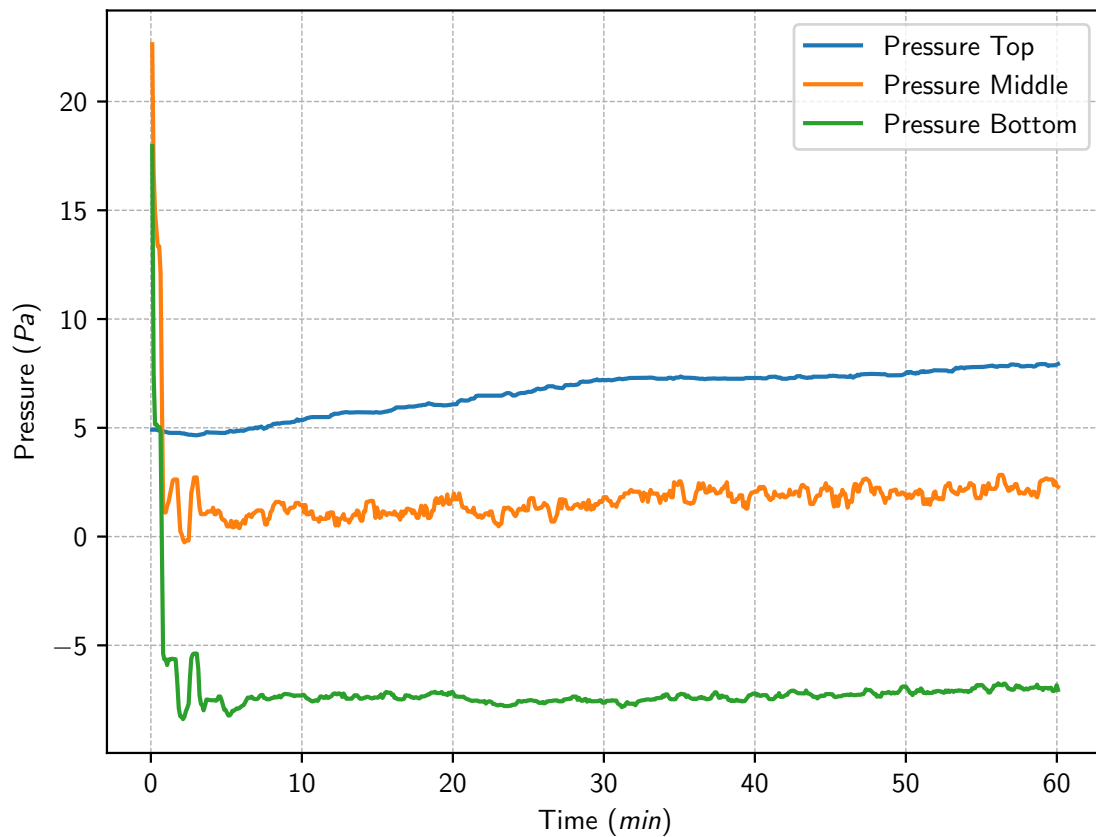


Figure 14: Top, middle and bottom differential pressures.

E Gas content

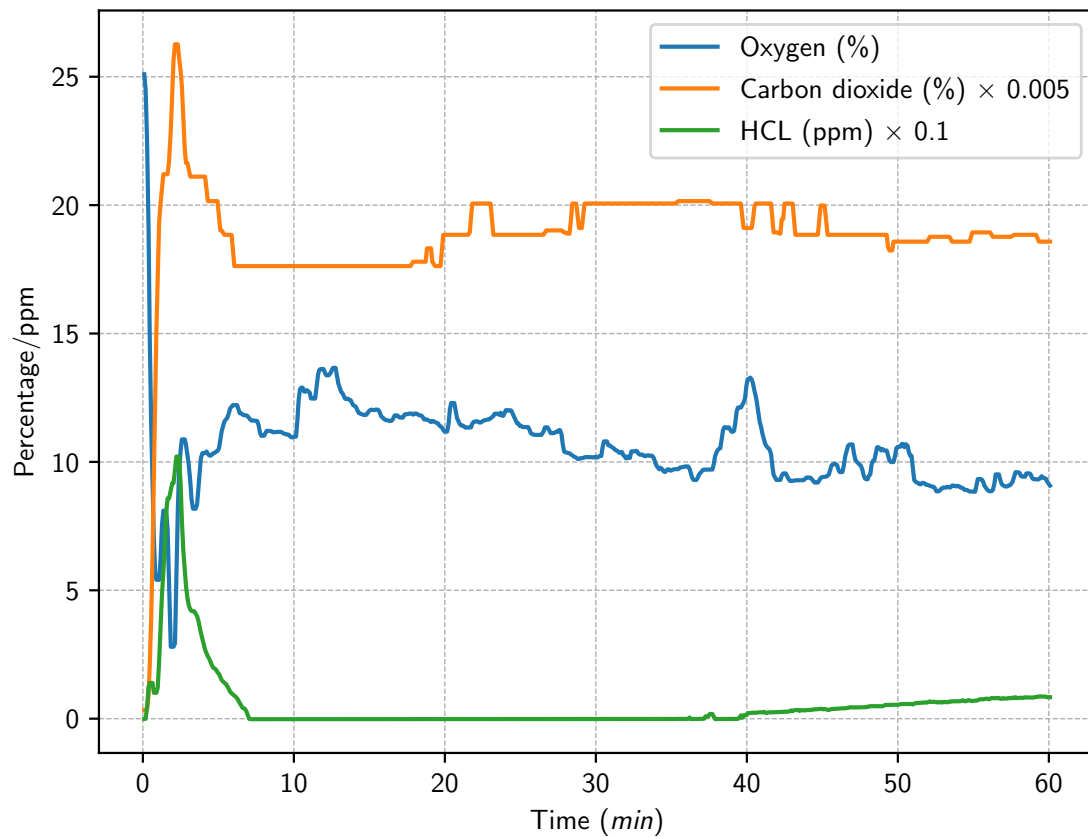


Figure 15: Gas content.

Amendments

Table 9: Amendments

Date	Amendment	Signatory Name and
2025-05-20	Original	PJ Gräbe



TEST NUMBER:

2025-05-15

SOLIDCAPE

SIGNATURE OF
SPONSOR

SIGNATURE OF
TEST ENGINEER

Attendance

Table 10: Attendance register.

Name	Company	Cell no.	Email
Carlo Kuhn	Ignis Fire Testing	(021)9050322	info@ignistesting.co.za
Dirk Streicher	Ignis Fire Testing	(021)9050322	info@ignistesting.co.za
Pieter Grabe	Ignis Fire Testing	(021)9050322	info@ignistesting.co.za
Johan Swart	Ignis Fire Testing	(021)9050322	info@ignistesting.co.za
Pieter Grobler	Ignis Fire Testing	(021)9050322	info@ignistesting.co.za
Anton Verster	Solid ceilings	633774584	anton@solidcape.co.za
Haydn Gawronsily	Solid ceilings	662234445	haydn@solidcape.co.za
Les	Solid ceilings	606684609	.61894749@99.wm