

Test Report No. BLS/R24/8044
dated 07 Jan 2025



TPT-BLS-01WI-F18 (rev.01, 28/10/2024)

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1. **SUBJECT:**

Research and development test on intumescent coating submitted by Unique Products (Thailand) Company Limited

2. **TESTED FOR:**

Unique Products (Thailand) Company Limited
104/35-36, Mu 12,
Bang Pla, Bang Phli,
Samut Prakan 10540 THAILAND.

3. **DATE SUBMITTED:**

18 Oct 2024

4. **DATE OF TEST:**

26 Nov 2024

5. **PURPOSE OF TEST:**

A research and development test were conducted to evaluate the performance of an intumescent coating following procedures based on ASTM E119-24. Please note that this test does not fully comply with ASTM E119-24, as the test specimen was modified to meet the specific research and development objectives of the test sponsor.

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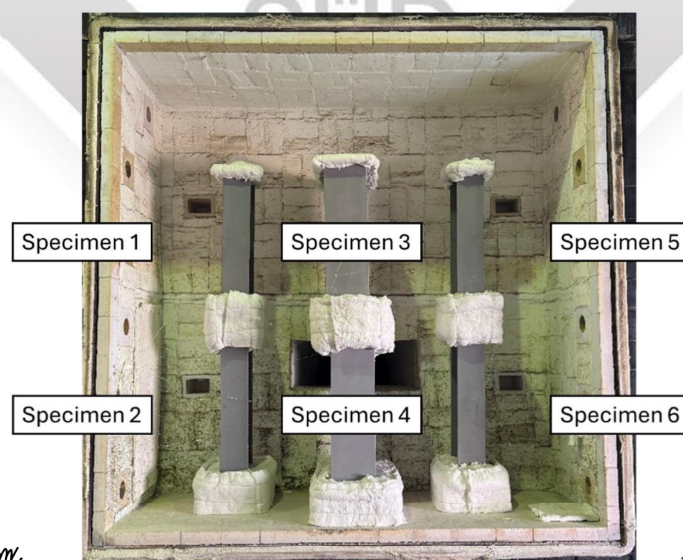
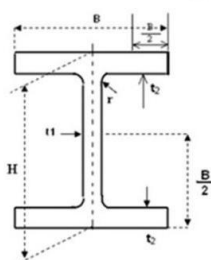
TÜV SÜD (Thailand) Limited
Building Lifecycle Service Centre
Navanakorn Industrial Zone 56/1, M.20, Paholyothin Rd.,
Klong Nueng, Klong Luang, Pathum Thani
12120 Thailand

6 DESCRIPTION OF TEST SPECIMEN:

6.1 The test consisted of six H-Beam specimens, each with a height of 100 mm and varying coating thicknesses (Appendix 1). Specimens 1, 2, 5, and 6 had a profile of 200 x 300 mm, while specimens 3 and 4 had a profile of 300 x 700 mm. These specimens were provided by Unique Products (Thailand) Company Limited.

Specimen No.	Profile			
	H (mm)	B (mm)	t ₁ (mm)	t ₂ (mm)
1	300	200	20	20
2	300	200	20	20
3	700	300	25	25
4	700	300	25	25
5	300	200	20	20
6	300	200	20	20

H-Beam



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7 PERFORMANCE CRITERIA:

Conditions of Acceptance for Alternative Test of Non-Loaded Steel Columns

Regard the test as successful if the transmission of heat through the protection during the period of fire exposure for which classification is desired does not raise the average (arithmetical) temperature of the steel at any one of the four levels above 1000 °F (538 °C) or does not raise the temperature above 1200 °F (649 °C) at any one of the measured points.

8 CONCLUSION:

The assembly described and tested in this report did meet the Conditions of Acceptance of ASTM E119-24 as detail below

Rated

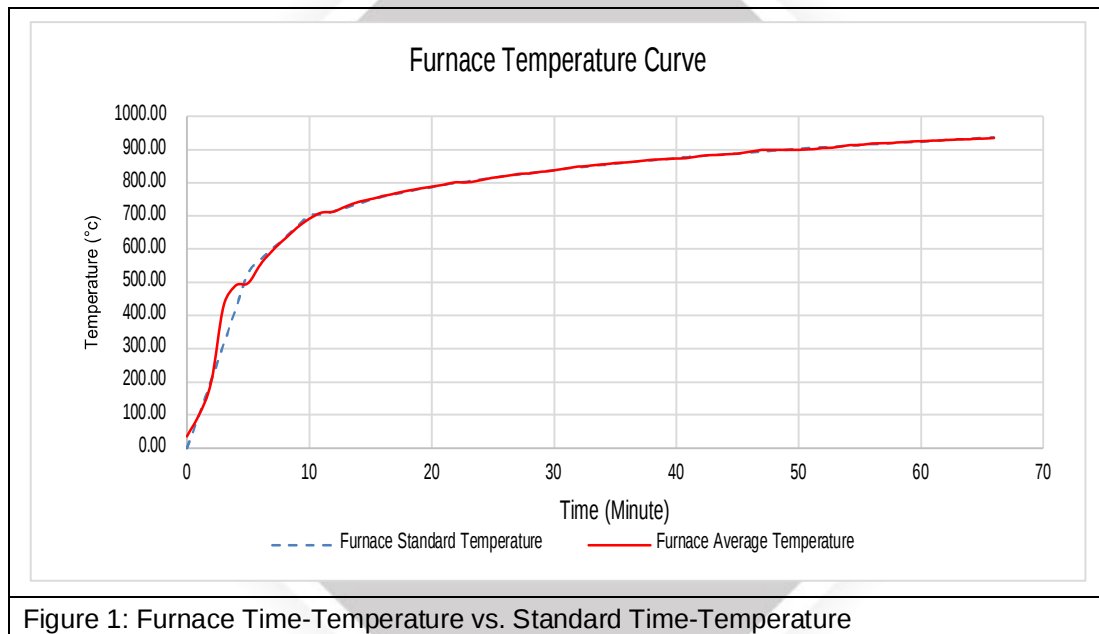
Specimen No.	Average 538 °C	Maximum 649 °C	Thermocouple rise above 649 °C
1	48 minutes	63 minutes	Sptc No.1 = 651°C
2	66 minutes	66 minutes	-
3	51 minutes	52 minutes	Sptc No.10 = 655°C
4	57 minutes	57 minutes	Sptc No.15 = 653°C
5	56 minutes	66 minutes	-
6	57 minutes	66 minutes	-

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Engineer
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TÜV SÜD (THAILAND) Limited

Thanet Tekumpornvepa
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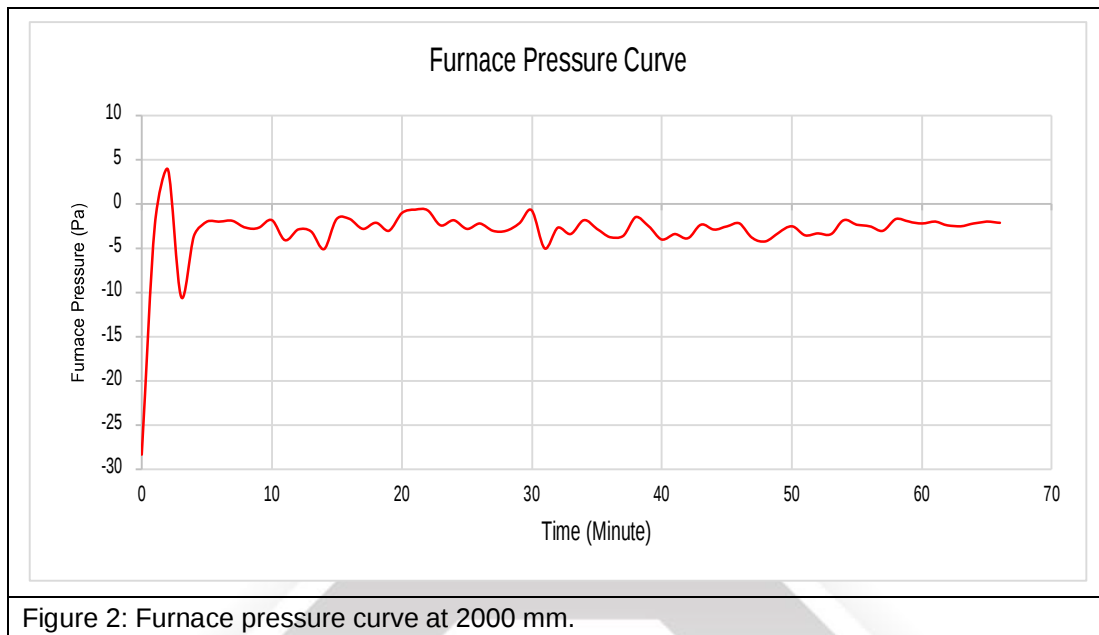
Table 1: Comparison of area under the curve

Time (min)	Temperature rise (°C)		Area under curve (°C min)		Percentage difference (%)	Standard tolerance ±%
	Standard	Furnace	Standard	Furnace		
5	527.55	497.04	1566.46	1436.24	-8.31	10
10	700.69	690.60	4739.11	4519.82	-4.63	
15	747.69	750.35	8367.10	8163.70	-2.43	
30	838.03	837.09	20404.32	20204.95	-0.98	
60	924.68	925.94	47042.91	46860.14	-0.39	



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APPENDIX 1

Specimen 1

Table 2: Thickness of intumescent coating

layer	Thickness (µm)								Average
	Face								
	1	2	3	4	5	6	7	8	
Primer	105	125	223	279	138	143	170	122	163
Intumescent	1202	1199	1052	1058	1173	1247	1118	1174	1153
Coating	172	150	202	124	157	82	183	222	161
Overall	1479	1473	1477	1461	1469	1472	1472	1518	1477

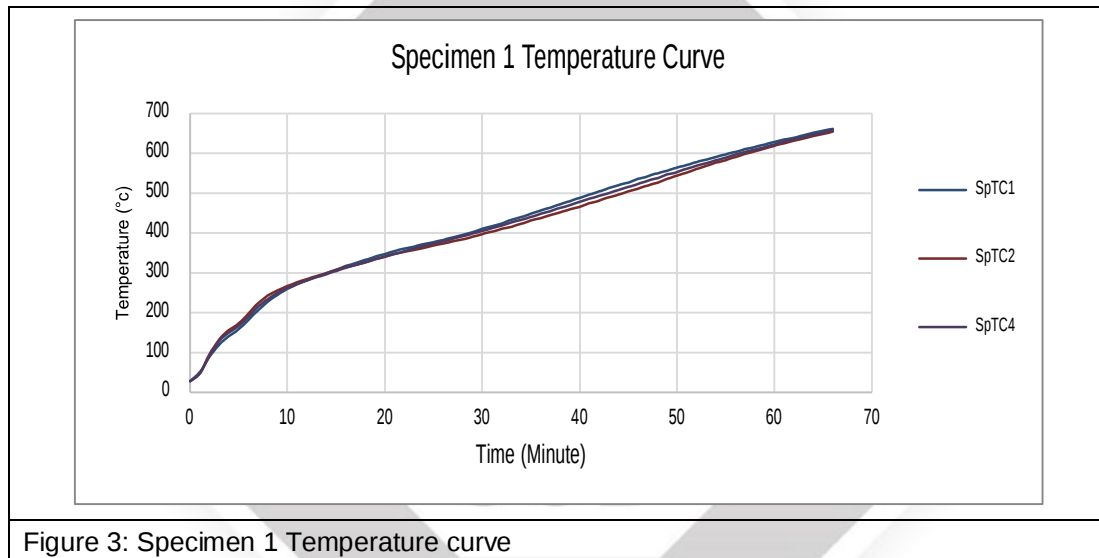


Figure 3: Specimen 1 Temperature curve

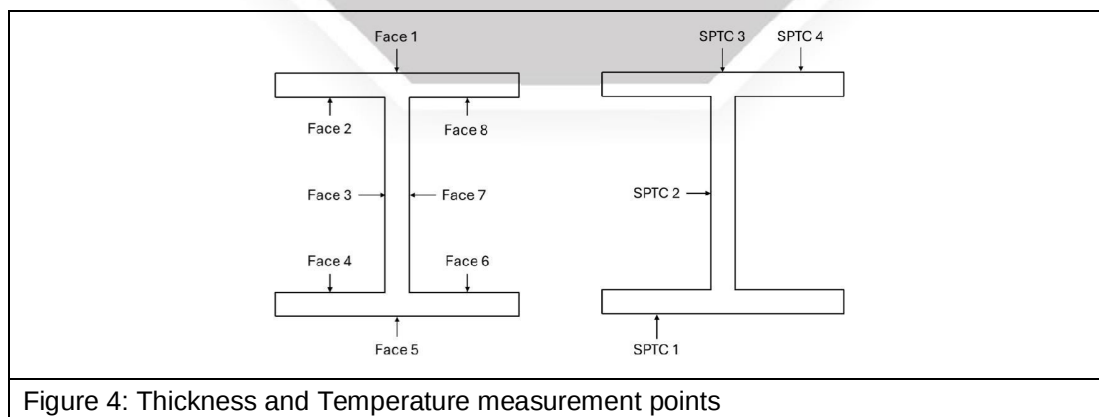
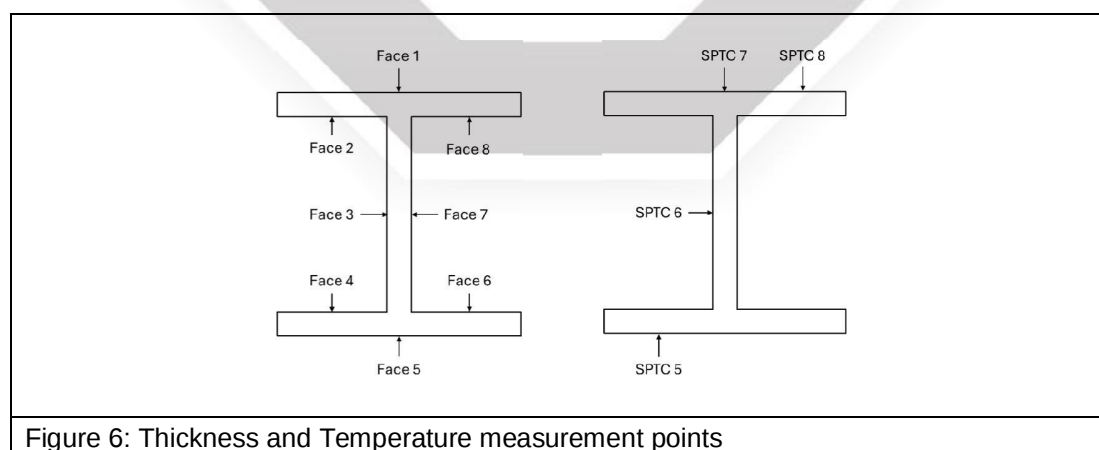
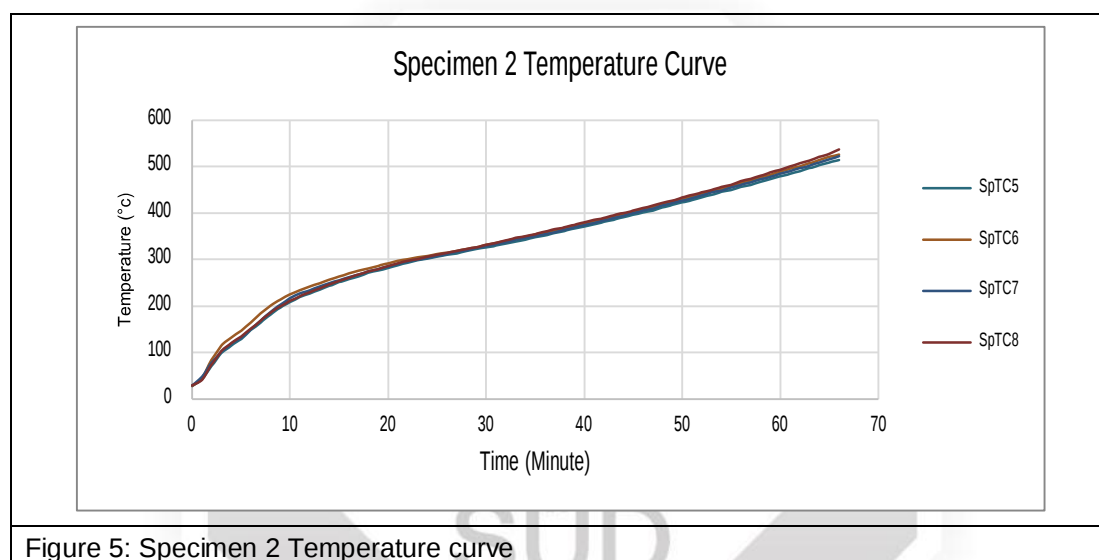


Figure 4: Thickness and Temperature measurement points

Specimen 2

Table 3: Thickness of intumescent coating

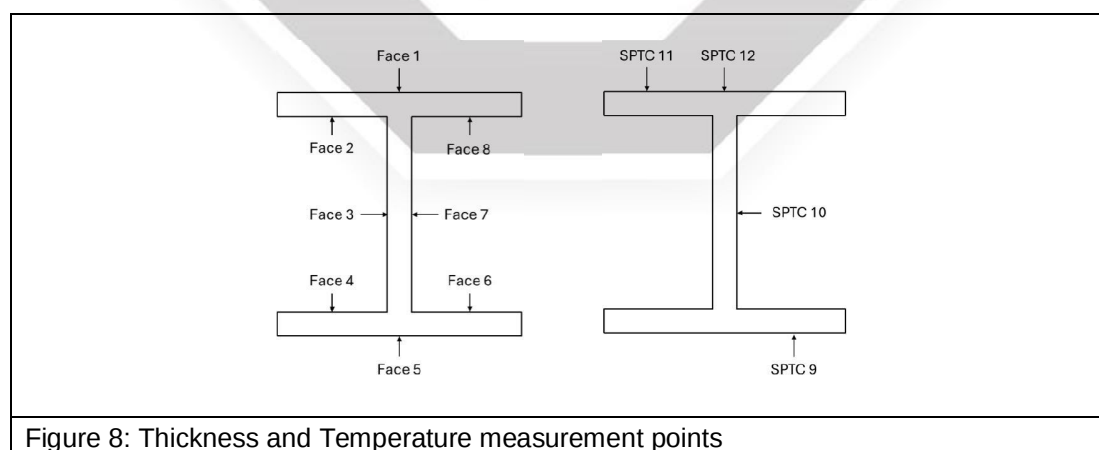
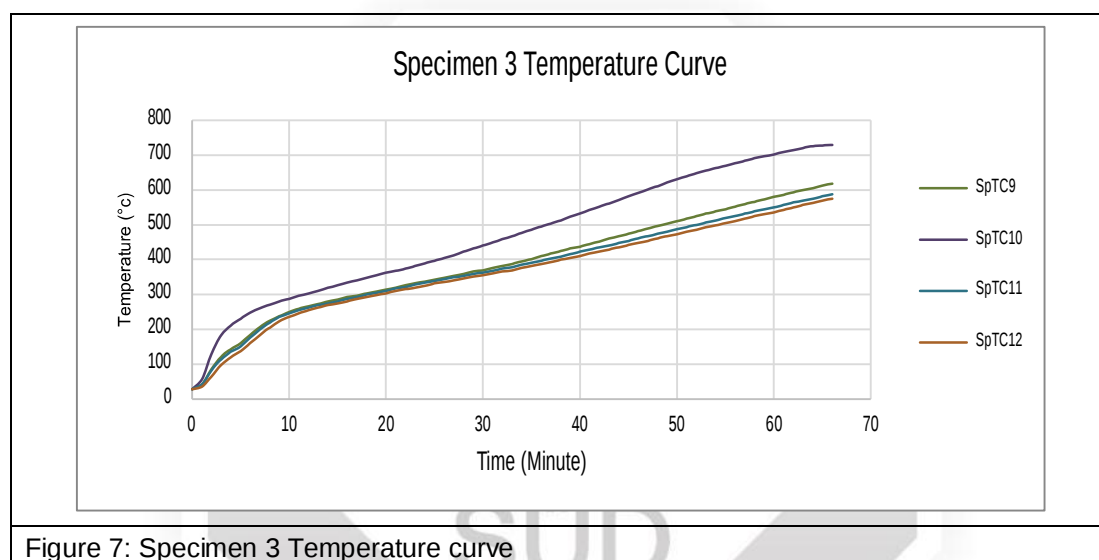
layer	Thickness (µm)								Average
	Face								
	1	2	3	4	5	6	7	8	
Primer	64	95	121	89	140	141	112	132	112
Intumescent	1098	1210	1311	1346	1109	1277	1285	1372	1251
Coating	267	267	123	132	255	153	175	70	180
Overall	1428	1572	1554	1567	1503	1571	1572	1573	1543



Specimen 3

Table 4: Thickness of intumescent coating

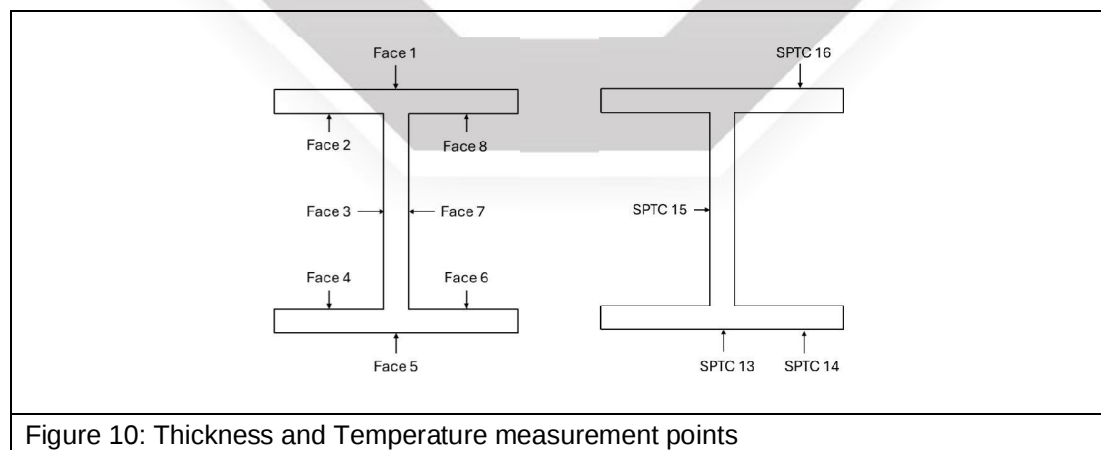
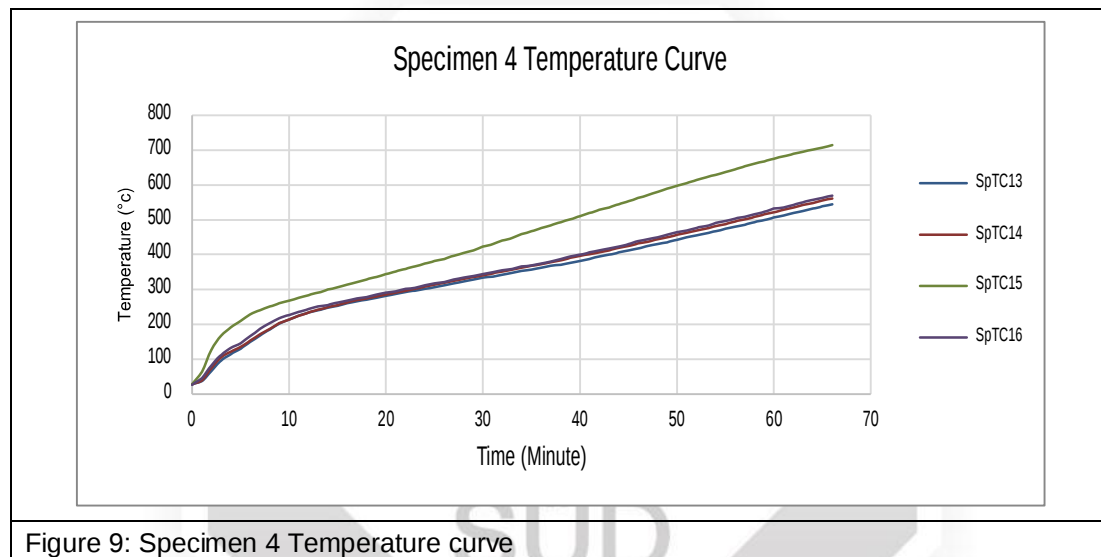
layer	Thickness (µm)								Average
	Face								
	1	2	3	4	5	6	7	8	
Primer	85	82	84	73	79	79	61	81	78
Intumescent	1307	1333	1360	1377	1376	1381	1350	1392	1359
Coating	256	159	126	120	115	120	165	110	146
Overall	1648	1574	1569	1570	1570	1580	1577	1583	1584



Specimen 4

Table 5: Thickness of intumescent coating

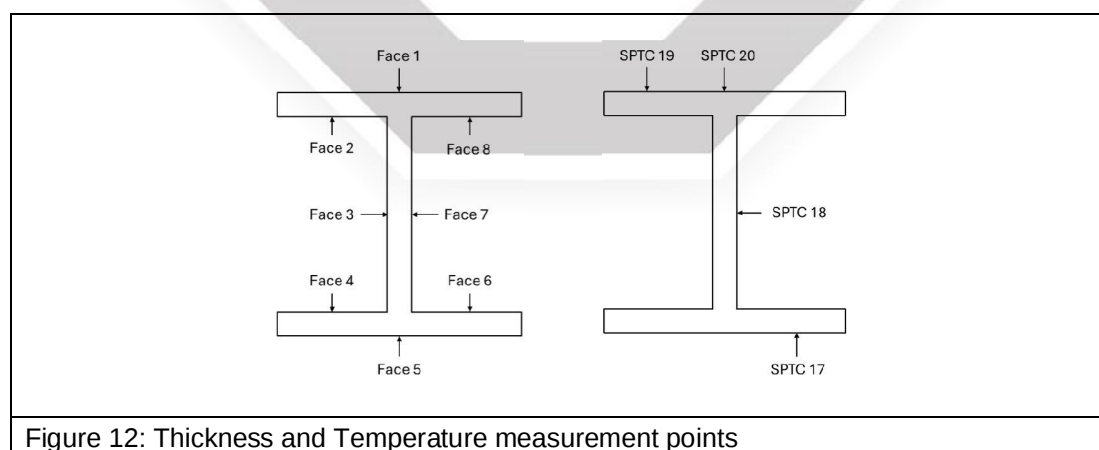
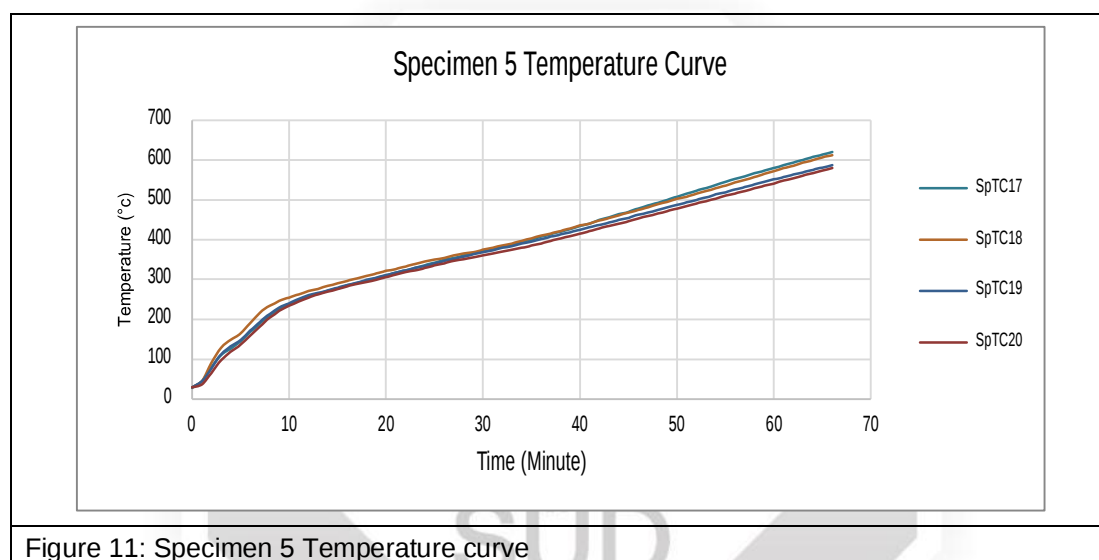
layer	Thickness (µm)								Average
	Face								
	1	2	3	4	5	6	7	8	
Primer	74	92	96	81	85	85	69	98	85
Intumescent	1878	1897	1860	1834	1850	1857	1928	1872	1872
Coating	182	168	193	230	228	208	150	181	192
Overall	2134	2156	2150	2145	2163	2150	2146	2151	2149



Specimen 5

Table 6: Thickness of intumescent coating

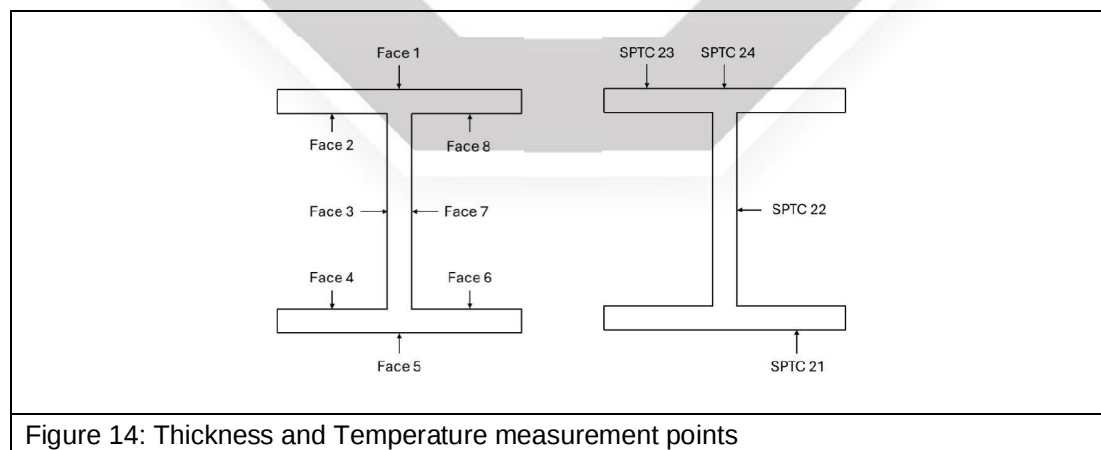
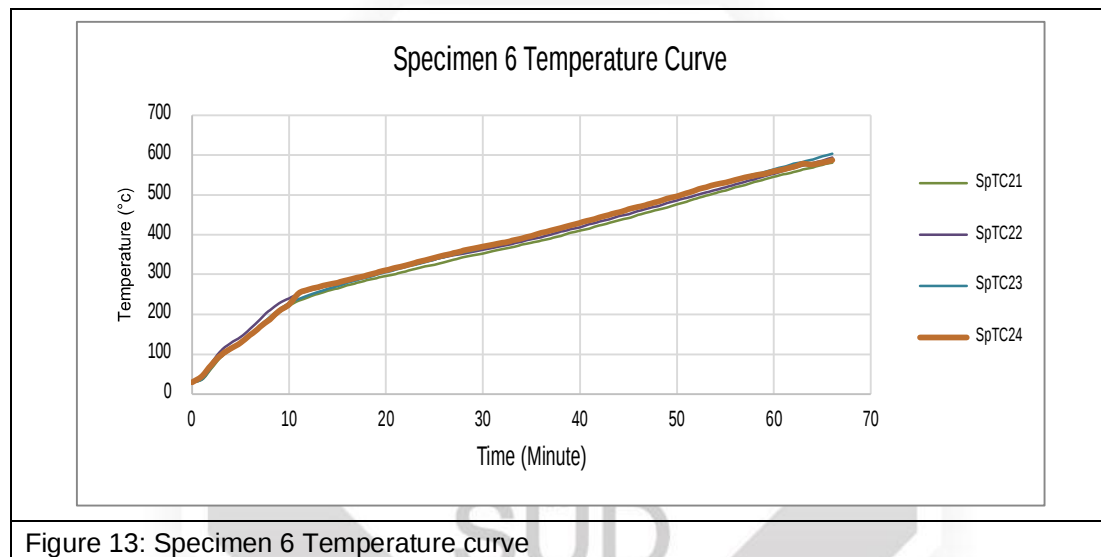
layer	Thickness (µm)								Average
	Face								
	1	2	3	4	5	6	7	8	
Primer	104	105	156	161	107	136	167	138	134
Intumescent	1559	1658	1579	1639	1635	1689	1618	1617	1624
Coating	279	242	213	207	217	126	208	256	219
Overall	1942	2006	1948	2007	1959	1951	1993	2011	1977



Specimen 6

Table 7: Thickness of intumescent coating

layer	Thickness (µm)								Average
	Face								
	1	2	3	4	5	6	7	8	
Primer	90	98	92	78	80	61	88	82	84
Intumescent	1862	1884	1904	1910	1910	1939	1916	1897	1903
Coating	200	161	154	172	163	157	143	172	165
Overall	2152	2143	2151	2161	2153	2157	2146	2150	2152



Photographs of test

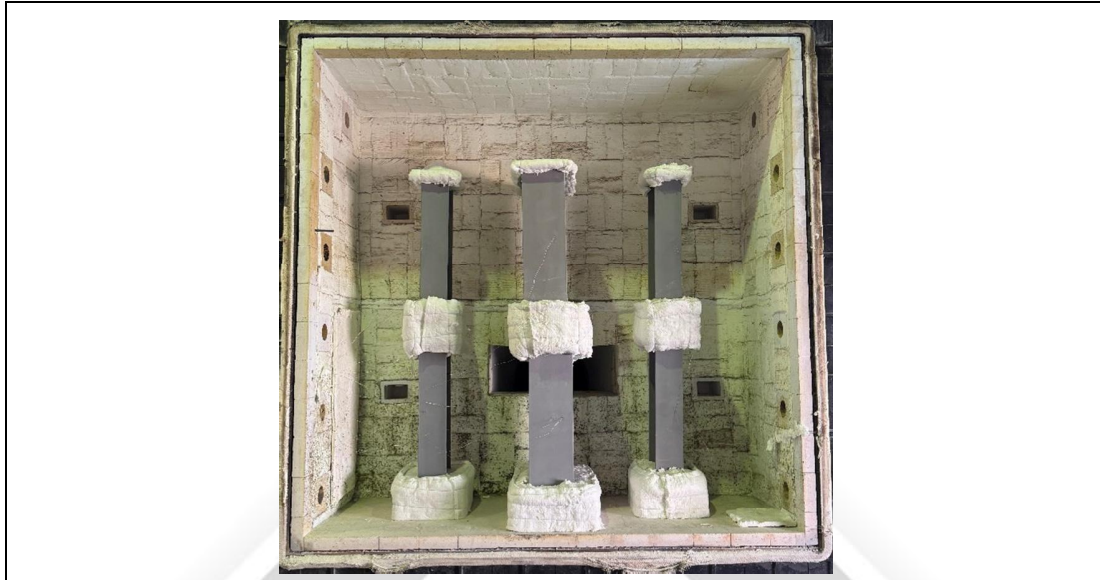


Figure 15: Specimen Pre-test



Figure 16: Specimen Pre-test (Cont.)

Norman S. M.

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Tax ID No. 0135544005027

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Figure 17: Specimen Post-test



Figure 18: Specimen Post-test (Cont.)

Norman Gm.

TUV



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Effective Nov 2024