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Fire testing according to EN ISO 11925-2 and EN ISO 9239-1 (3 appendices)

Abstract

Reaction to fire testing was performed by commission of Edvardssons i Bredbyn AB.

The single-flame source test was utilised, which involved measurements of ignitability according to Reaction to fire tests – Ignitability of building products subjected to direct impingement of flame – Part 2: Single-flame source test, EN ISO 11925-2 (ST 306).

The radiant heat source test was utilised, which involved measurements of burning behaviour according to Reaction to fire tests for floorings – Part 1: Determination of the burning behaviour using a radiant heat source, EN ISO 9239-1 (ST 313).

The test results are summarised in Table 1-2.

Product

According to the client:

“Two flooring systems for use in sport halls / ice rink events has been tested. The floorings are called "Crescendo System Golv Event" and "Crescendo System Golv Event Isolerat".

The flooring "Crescendo System Golv Event" consists of 18 mm birch plywood and is overlaid on both sides with a phenol film 120 g/m² in different colours. The floorings are in blocks with dimensions 1196 x 805 x 18 mm or 805 x 598 x 18 mm (length x width x thickness). In one long side and one short side of the block a plastic strip is fixed for assembly. Nominal total thickness is 18 mm.

The flooring "Crescendo System Golv Event Isolerat" consists of two 9 mm birch plywood and is overlaid on both sides with a phenol film 120 g/m² in different colours. The plywood is glued to a wooden frame and in the frame is included 20 mm expanded polystyrene. The floorings are in blocks with dimensions 1196 x 805 x 38 mm or 805 x 598 x 38 mm (length x width x thickness). In one long side and one short side of the block a plastic strip is fixed for assembly. Nominal total thickness is 38 mm."

Measured data:

"Crescendo System Golv Event": Thickness: 17,3 mm. Density: 740 kg/m³.

"Crescendo System Golv Event Isolerat": Thickness: 37,6 mm. Density: 540 kg/m³.

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The products were delivered to SP Trä (Wood Technology) on 5 March 2013.

The specimens were cut to size (250 x 90 mm and 1050 mm x 230 mm) in the production direction (lengthwise, L) by the client. The joints in the lengthwise direction (most severe direction) of the flooring were placed at central position of the specimens.

All specimens were conditioned to constant mass in a controlled climate chamber at 23 ± 2 °C and 50 ± 5 % RH at SP Trä before the fire testing. The fire tests were performed on 21 and 25 March 2013.

Fire tests

The fire tests were performed in the single-flame source test. Measurements of ignitability parameters were made according to EN ISO 11925-2 (ST 306). The time was measured with a stop watch with register no FS/F 132. The flame was applied for 15 s, and was exposed to the surface 40 mm above the bottom edge. Six tests were performed. The specimens were tested with a 19 mm Particle board standard substrate according to EN 13238.

The fire tests were performed in the radiant heat source test. Measurements of burning behaviour were made according to EN ISO 9239-1 (ST 313). The specimens were tested with a 19 mm Particle board standard substrate according to EN 13238.

Test results

The test results are summarised in Table 1-2.

Table 1. Test results for **Crescendo System Golv Event** (phenol film light brown) with surface exposure of flame for 15 s.

Specimen	Ignition occurs No/Yes	Time to reach 150 mm (s)	Ignition of filter paper occurs No/Yes	Observations
1	No	-	No	
2	No	-	No	
3	No	-	No	
4	No	-	No	
5	No	-	No	
6	No	-	No	
average	No	-	No	

Table 2. Summary table.
Test results from EN ISO 9239-1.

Product	Phenol colour	HF-30 or CHF (kW/m ²)	IoS (% min)	Appendix No.
Crescendo System Golv Event	Light brown	6,00/8,99/7,48 average 7,49	7/28/28 average 21	1
Crescendo System Golv Event	Grey	9,23	15	2
Crescendo System Golv Event Isolrat	Light brown	7,48	4	3

Measured data: HF-30 Heat Flux at 30 min
 CHF Critical Heat Flux at extinguishment
 IoS Integral of the Smoke obscuration

Statement

The test results relate to the behaviour of the test specimens of the product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

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Appendices

1-3. Test results according to EN ISO 9239-1

Flooring Radiant Panel Test Results

SP Trä 2013-04-16

Report No. 3P02205

Appendix No. 1

Flooring: Crescendo System Golv Event, 18 mm, phenol film light brown 120 g/m²
Substrate: Particle board

Specimen *	HF-10 kW/m ²	HF-20 kW/m ²	HF-30 kW/m ²	CHF kW/m ²	Flame spread 10 min mm	Flame spread 20 min mm	Flame spread 30 min mm	Flame spread maximum mm	Self extinguishing min:s	Maximum light attenuation %	Integral of the smoke obscuration % min
1 L	≥ 10,9	8,28	6,00	-	70	250	355	355	-	2	7
2 L	≥ 10,9	9,23	8,99	-	70	210	220	220	-	4	28
3 L	≥ 10,9	8,52	7,48	-	80	240	285	285	-	3	28
Average L	≥ 10,9	8,68	7,49	-	73	233	287	287	-	3	21

Time (min:s) at which the flames reach each 50 mm mark

Specimen *	60 mm	110 mm	160 mm	210 mm	260 mm	310 mm	360 mm	410 mm	460 mm	510 mm	560 mm	610 mm
1 L	9:10	12:49	14:58	17:48	20:46	24:00	-	-	-	-	-	-
2 L	9:30	13:03	16:54	20:01	-	-	-	-	-	-	-	-
3 L	8:18	11:23	15:16	18:08	22:45	-	-	-	-	-	-	-
Average L	8:59	12:25	15:43	18:39	-	-	-	-	-	-	-	-

* L lengthwise.

Flooring Radiant Panel Test Results

SP Trä 2013-04-16

Report No. 3P02205
Appendix No. 2Flooring: Crescendo System Golv Event, 18 mm, phenol film grey 120 g/m²
Substrate: Particle board

Specimen *	HF-10	HF-20	HF-30	CHF	Flame spread 10 min	Flame spread 20 min	Flame spread 30 min	Flame spread maximum	Self extinguishing	Maximum light attenuation	Integral of the smoke obscuration
	kW/m ²	kW/m ²	kW/m ²	kW/m ²	mm	mm	mm	mm	min:s	%	% min
1 L	≥ 10,9	9,23	9,23	-	80	210	210	210	-	2	15
Average L	≥ 10,9	9,23	9,23	-	80	210	210	210	-	2	15

Time (min:s) at which the flames reach each 50 mm mark

Specimen *	60 mm	110 mm	160 mm	210 mm	260 mm	310 mm	360 mm	410 mm	460 mm	510 mm	560 mm	610 mm
1 L	9:01	11:14	14:07	18:07	-	-	-	-	-	-	-	-
Average L	9:01	11:14	14:07	18:07	-	-	-	-	-	-	-	-

* L lengthwise.

Appendix 2

Flooring Radiant Panel Test Results

SP Trä 2013-04-16

Report No. 3P02205
Appendix No. 3

Flooring: Crescendo System Golv Event Isolerat, 38 mm, phenol film light brown 120 g/m²
Substrate: Particle board

Specimen *	HF-10	HF-20	HF-30	CHF	Flame spread 10 min	Flame spread 20 min	Flame spread 30 min	Flame spread maximum	Self extinguishing min:s	Maximum light attenuation %	Integral of the smoke obscuration % min
1 L	≥ 10,9	8,99	7,48	-	55	220	285	285	-	1	4
Average L	≥ 10,9	8,99	7,48	-	55	220	285	285	-	1	4

Time (min:s) at which the flames reach each 50 mm mark

Specimen *	60 mm	110 mm	160 mm	210 mm	260 mm	310 mm	360 mm	410 mm	460 mm	510 mm	560 mm	610 mm
1 L	10:21	13:50	16:33	19:12	-	-	-	-	-	-	-	-
Average L	10:21	13:50	16:33	19:12	-	-	-	-	-	-	-	-

* L lengthwise.

Appendix 3