Das Kunststoff-Zentrum

SKZ

Test report no.: **122572/16**

Customer:
HANWHA L&C
Hanwha Building 1
Janggyo-Dong Chung-Gu
100-797 SEOUL
KOREA

Order: Testing of the heating of laminated profile surfaces upon exposure to an artificial radiation source according to Technical appendix "Section II" to RAL-GZ 716, part II-a-3, appendix I "Testing of the heating of coloured profile surfaces upon exposure to an artificial radiation source", issue April 2014.

Email dated: 2016-09-08 **Ref:** Mr Park

Sample receipt: 2016-09-13

Test period: 2016-09-21 to 2016-09-30

This test report consists of 4 pages.

Würzburg, 2016-10-17
Wk/km

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international akkreditiert SKZ - Testing GmbH

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The original language of the report is German. In case of doubt, the German version is obligatory.

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1. Order

The Company HANWHA L&C, Hanwha Building 1, Janggyo-Dong Chung-Gu, 100-797 SEOUL, KOREA, instructed the SKZ - Testing GmbH by e-mail of 8 September 2016 to test the heating of laminated profile surfaces upon exposure to an artificial radiation source according to Technical appendix "Section II" to RAL-GZ 716, part II-a-3, appendix I "Testing of the heating of coloured profile surfaces upon exposure to an artificial radiation source", issue April 2014.

2. Test material

On 13 September 2016 SKZ - Testing GmbH received following samples for testing:

5 DIN A4 sections of each décor.

Designation of the foils according to manufacturers data or suppliers data:

Sample no.	Designation of foil
1	**HH1GO1**
2	**HH3NO**

3. Test procedure

The tests described in the following have been performed in accordance with the Technical appendix "Section II" to RAL-GZ 716, part II- a-3, appendix I "Testing of the heating of coloured profile surfaces upon exposure to an artificial radiation source", issue April 2014. The test procedure was carried out according to standard climate 23/50, class 1 according to DIN EN ISO 291: 2008-08.

Usually we carry out tests according to standards for which we have an accreditation. The list of all standards for which we are accredited is shown on the homepage at www.skz.de .

The test was predominantly effected as double determination on black base body and as double determination on white base body.

Non-black pigmented PVC-U plates with L*>92 have been used as white base bodies and homogeneous black PVC-U plates with a carbon black content of 0.5 % +/- 0.1 % have been used as black base bodies.

The foils have been applied by means of a double-faced adhesive tape "HDK7408" of company Hohner-Industrietechnik without causing bubbles.

The radiation was implemented by means of a dim IR radiator Siccatherm "Sicca FR 250W HG".

4. Test results

Determination on black base body

HH1GO1					
	Sample 1	°C		Sample 2	°C
1	$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	73.6		$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	73.6
	$T_{black\ reference\ sample\ (after\ measuring)}$	73.5		$T_{black\ reference\ sample\ (after\ measuring)}$	73.5
	$T_{white\ reference\ sample}$	52.3		$T_{white\ reference\ sample}$	52.3
	T_{room}	22.8		T_{room}	22.8
	ΔT	10.6		ΔT	11.4
	T_{sample}	**63.0**		**T_{sample}**	**62.2**

HH3NO					
	Sample 1	°C		Sample 2	°C
2	$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	74.2		$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	74.2
	$T_{black\ reference\ sample\ (after\ measuring)}$	74.4		$T_{black\ reference\ sample\ (after\ measuring)}$	74.4
	$T_{white\ reference\ sample}$	53.1		$T_{white\ reference\ sample}$	53.1
	T_{room}	23.0		T_{room}	23.0
	ΔT	12.5		ΔT	13.0
	T_{sample}	**61.8**		**T_{sample}**	**61.3**

Determination on white base body

HH1GO1					
	Sample 1	°C		Sample 2	°C
1	$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	73.6		$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	73.6
	$T_{black\ reference\ sample\ (after\ measuring)}$	73.5		$T_{black\ reference\ sample\ (after\ measuring)}$	73.5
	$T_{white\ reference\ sample}$	52.3		$T_{white\ reference\ sample}$	52.3
	T_{room}	22.8		T_{room}	22.8
	ΔT	14.8		ΔT	15.3
	T_{sample}	**58.8**		**T_{sample}**	**58.3**

HH3NO					
	Sample 1	°C		Sample 2	°C
2	$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	74.2		$T_{black\ reference\ sample\ (prior\ to\ measuring)}$	74.2
	$T_{black\ reference\ sample\ (after\ measuring)}$	74.4		$T_{black\ reference\ sample\ (after\ measuring)}$	74.4
	$T_{white\ reference\ sample}$	53.1		$T_{white\ reference\ sample}$	53.1
	T_{room}	23.0		T_{room}	23.0
	ΔT	18.7		ΔT	18.4
	T_{sample}	**55.6**		**T_{sample}**	**55.9**

Summary

Sample	T_{sample} on black	T_{sample} on white
HH1GO1	63 °C	59 °C
HH3NO	62 °C	56 °C