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19. Oktober 2015 / ste

Test order no. 117327/15 (continuation of test order no. 113768/14)

Interim results of the weathering fastness test (colour fastness) according to Technical appendix "section II" to RAL-GZ 716, part II-a-3, issue December 2013 on window profiles made of PVC-U laminated with films

Dear Mr. Park,

Please find below the following results of the interim assessment of the weathering fastness after the artificial weathering of approx. **18,000** hours:

Irradiation energy: approx. **36 GJ/m²**

Artificial weathering according to (DIN) EN 513: 1999-10, procedure **1** (simulation of a **moderate** climate zone **M**) up to an irradiation dose of **40 GJ/m²** in the wave length range between 300 nm and 800 nm.

1. Colourimetric assessment:

The sample colour was measured by means of a spectrophotometer of a wave length area of 360 - 750 nm, standard light type D65, gloss inclusion, 10° normal inspection. The colour distance ΔE^*_{ab} was determined according to DIN EN ISO 11664-4: 2012-06. Prior to and after artificial weathering, colour was measured at the same position on the sample to obtain reproducible results despite the structured surface.

Please note that the colourimetric assessment of the structured foils can only be taken as a guide value.

Foil designation: "**Golden Oak**", **HM1GO**

Time of exposure	Dose of irradiation	Colour coordinates			Total colour distance Delta E
		Delta L*	Delta a*	Delta b*	
1000 h	2 GJ/m ²	-1.7	1.0	4.0	4.5
2000 h	4 GJ/m ²	-0.4	0.3	1.3	1.4
3000 h	6 GJ/m ²	-0.2	0.2	0.7	0.8
4000 h	8 GJ/m ²	-0.1	0.0	0.5	0.5
5000 h	10 GJ/m ²	0.1	0.0	0.5	0.5
6129 h	12 GJ/m ²	0.2	0.0	0.7	0.7
7000 h	14 GJ/m ²	0.2	0.0	0.8	0.8
8000 h	16 GJ/m ²	0.3	0.0	0.9	1.0
9000 h	18 GJ/m ²	0.4	0.0	1.1	1.2
10187 h	20 GJ/m ²	0.5	0.0	1.2	1.3
11000 h	22 GJ/m ²	0.5	0.1	1.5	1.6
12000 h	24 GJ/m ²	0.6	0.0	1.6	1.7
13000 h	26 GJ/m ²	0.6	0.1	1.8	1.9
14000 h	28 GJ/m ²	0.6	0.1	2.2	2.3
15308 h	30 GJ/m ²	0.7	0.2	2.4	2.5
16000 h	32 GJ/m ²	0.8	0.4	2.8	2.9
17000 h	34 GJ/m ²	0.9	0.7	3.1	3.3
18000 h	36 GJ/m ²	0.7	1.1	4.1	4.3
19000 h	38 GJ/m ²	-	-	-	-
20000 h	40 GJ/m ²	-	-	-	-

2. Visual assessment

Visual assessment was performed according to DIN EN 20105-A03 and DIN EN 20105-A02 with the grey scale.

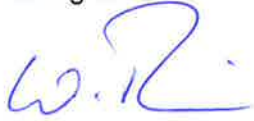
Time of exposure	Dose of irradiation	Grey scale value		Remark
		A02	A03	
1000 h	2 GJ/m ²	4 - 5	4 - 5	more yellow, plaque
2000 h	4 GJ/m ²	4 - 5	4 - 5	more yellow, plaque
3000 h	6 GJ/m ²	4 - 5	4 - 5	more yellow, plaque
4000 h	8 GJ/m ²	4 - 5	4 - 5	more yellow, plaque
5000 h	10 GJ/m ²	4 - 5	4 - 5	more yellow
6129 h	12 GJ/m ²	4 - 5	4 - 5	more yellow
7000 h	14 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
8000 h	16 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
9000 h	18 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
10187 h	20 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
11000 h	22 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
12000 h	24 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
13000 h	26 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
14000 h	28 GJ/m ²	4 - 5	4 - 5	more yellow, more gloss
15308 h	30 GJ/m ²	4 - 5	4 - 5	more yellow
16000 h	32 GJ/m ²	4 - 5	4 - 5	more yellow
17000 h	34 GJ/m ²	4 - 5	4 - 5	more yellow
18000 h	36 GJ/m ²	4 - 5	4 - 5	more yellow
19000 h	38 GJ/m ²	-	-	-
20000 h	40 GJ/m ²	-	-	-

If you have any questions, don't hesitate to contact me.

Best regards

SKZ - Testing GmbH

i. A.

A handwritten signature in blue ink, appearing to be 'W. Ries'.

Wolfgang Ries