Accelerated Weathering Test

Decoral LAB
Research and Development

MILLENNIUM 3D

MRK 010-0435

TEST DI INVECCHIAMENTO ACCELERATO:

Invecchiamento accelerato

Tutti i campioni vengono sottoposti all'irraggiamento di lampade allo xenon ed a cicli umido/secco mediante speciali apparecchiature (Q-Sun, SolarBox).Tali apparecchiature vengono utilizzate in conformità agli standard internazionali imposti dalla norma ISO 11341 rispettando le seguenti impostazioni:

- intensità luminosa, 550±20W/m^2 (290-800 nm)
- temperatura del pannello nero, 65 ± 5°C
- ciclo umido 18 minuti
- ciclo secco 102 minuti

Alla fine dei test, che normalmente hanno una durata minima di 1000 ore, viene valutata la variazione di brillantezza (EN ISO 2813, con angolo di incidenza 60°) ed il cambiamento di colore ΔE (metodo CIELAB ISO 7724/3) rispetto ai valori di partenza. Questo permette di stabilire, in maniera parametrizzata, l'invecchiamento delle varie superfici testate. La corretta conduzione dei test viene verificata attraverso l'utilizzo di campioni in bianco ad invecchiamento noto.

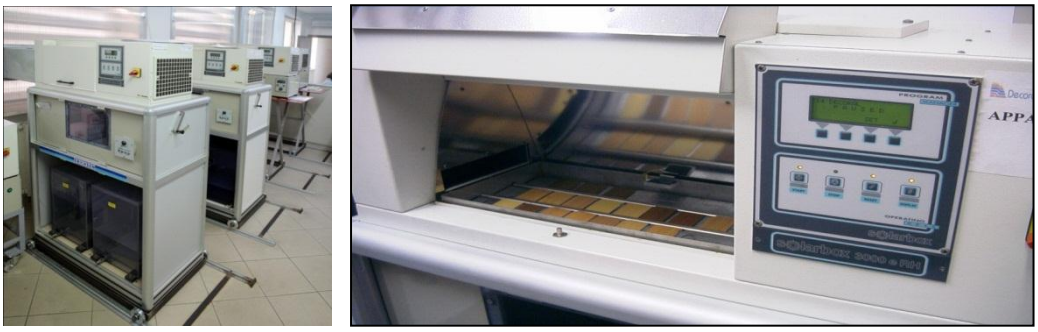


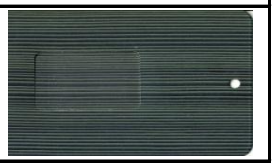
Figure: apparecchiature per l'invecchiamento accelerato.
Pictures: equipment for the Accelerated Weathering Test

Accelerated Weathering Test

All samples are exposed to radiation of Xenon lamps and to wet/dry cycles by special equipment (Q-Sun, SOLARBOX). Such equipment is used in accordance with international standards imposed by norm ISO 11341, i.e. complying with the following settings:

- light intensity, 550 ± 20 W / m^2 (290-800 nm)
- black panel temperature, 65 ± 5 ° C
- wet cycle 18 minutes
- dry cycle 102 minutes.

At the end of the test, whose minimum duration is 1000 hours, Residual Gloss (EN ISO 2813, with an angle of incidence 60°) and Colour Variation ΔE (CIELAB method - ISO 7724 / 3) are measured comparing pre-test values. In this way it is possible to evaluate the aging of surfaces using standard indexes. The accuracy of the test is verified through the use of samples in white, whose aging behaviour is know.

ID Test Report	PROD. VERNIC	COD. FILM	PROG. N°	IMMAGINI
TR-IA-36-2015	DS-0402S	2121/01	36	
TR-IA--35-2015	DS 442	2121/02	35	
TR-IA-34-2015	8C-049-A001	2121/02	34	
TR-IA-302-2012	DS-0418S	2117/01	302	
TR-IA-265-2012	DS 721	2117/02	265	
TR-IA-217-2012	DS 472	2117/03	217	

Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

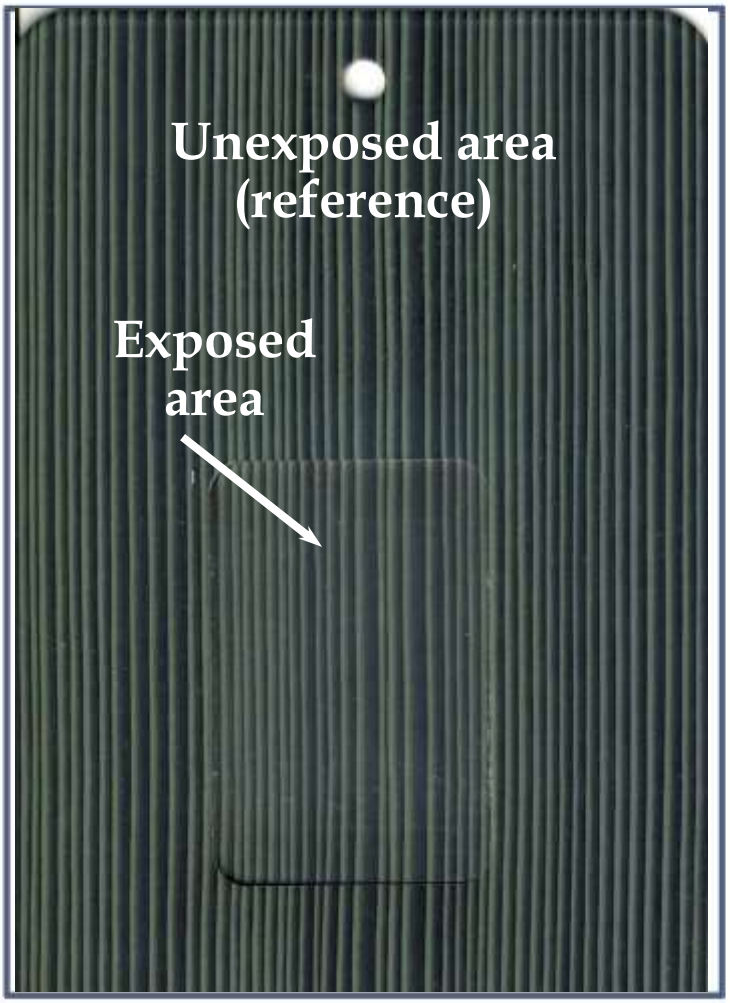
34

Laboratory Test

No. 434

Device: Sola 3000RH

Total duration: 1050h



LAB. ID NUMBER: 36387
POWDER COATING: 8C-049-A001
HEAT TRANSFER FILM: 2121/02
colour variation (ΔE): **1,88**
residual gloss: **72%**

Technical Remarks

Good residual gloss and low colour variation (ΔE), after 1050 hours.

Technical Opinion:

Suitable for OUTDOOR USE

Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment see further analysis on natural exposure in Florida.

Test Report: Accelerated Weathering Test

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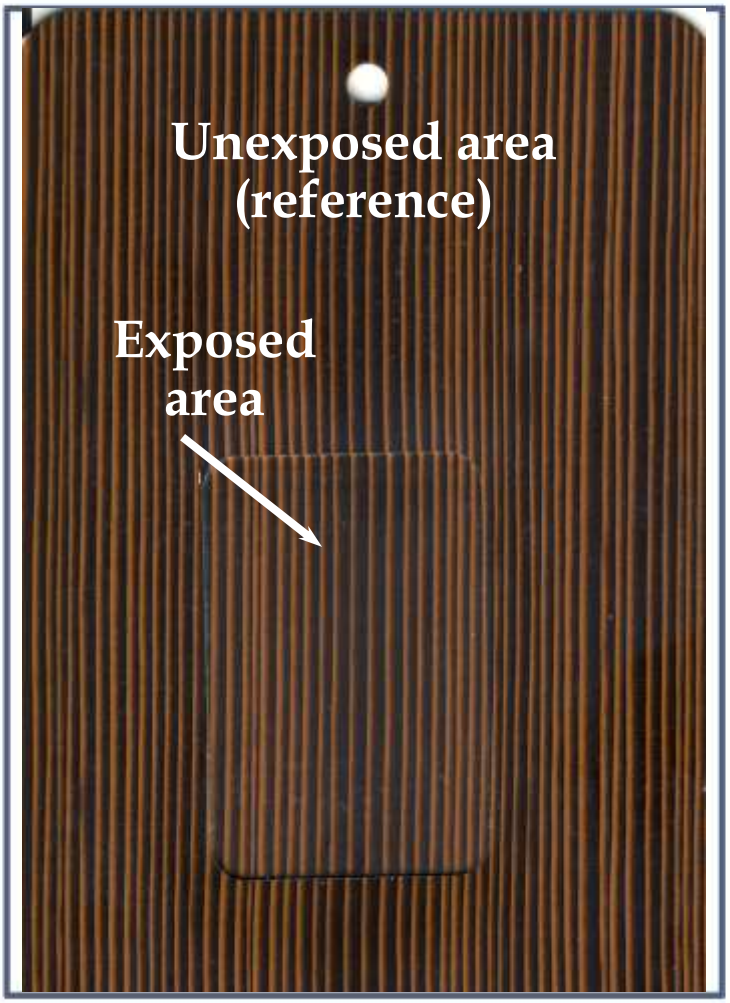
35

Laboratory Test	No. 434	Device: Sola 3000RH	Total duration: 1050h



LAB. ID NUMBER: 36391
POWDER COATING: DS 442
HEAT TRANSFER FILM: 2121/02
colour variation (ΔE): **1,45**
residual gloss: **65%**

Technical Remarks

Sufficient residual gloss and low colour variation (ΔE), after 1050 hours.

Technical Opinion:

Suitable for OUTDOOR USE

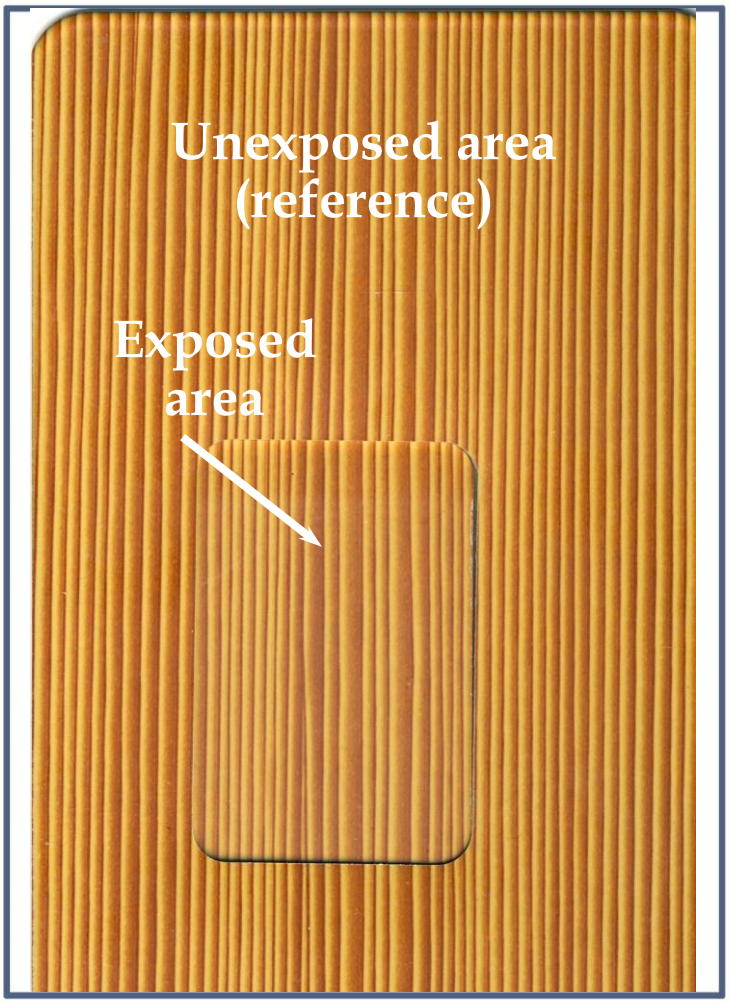
Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment see further analysis on natural exposure in Florida.

Laboratory Test

No. 434

Device: Sola 3000RH

Total duration: 1050h



LAB. ID NUMBER: 36393
POWDER COATING: DS-0402S
HEAT TRANSFER FILM: 2121/01
colour variation (ΔE): **2,49**
residual gloss: **65%**

Technical Remarks

Sufficient residual gloss and low colour variation (ΔE),
after 1050 hours.

Technical Opinion:

Suitable for OUTDOOR USE

Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment see further analysis on natural exposure in Florida.

Test Report: Accelerated Weathering Test

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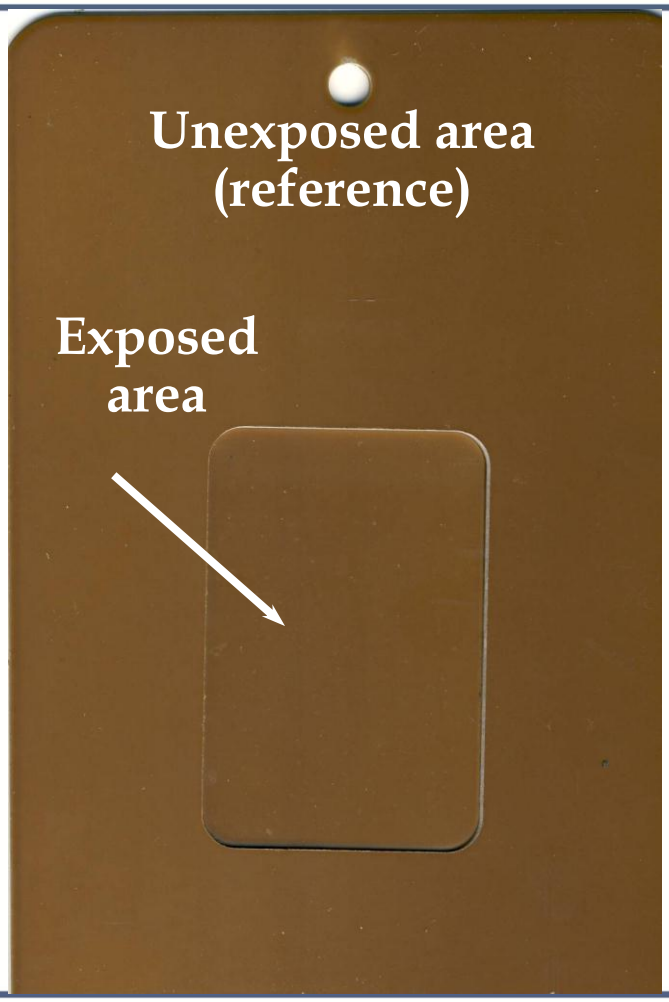
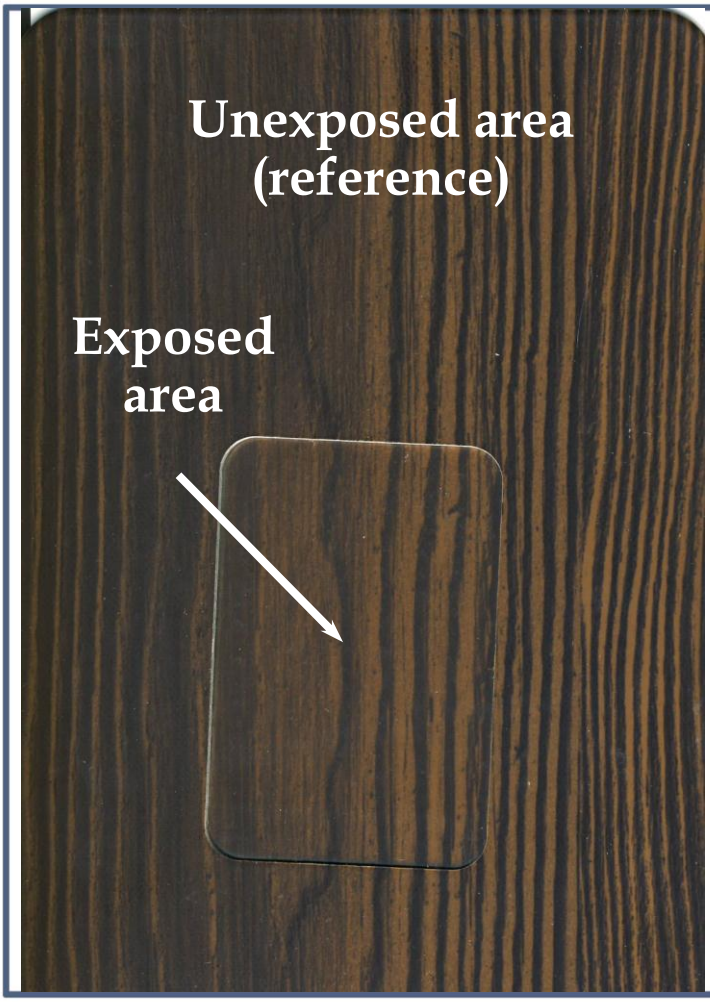
217

Laboratory Test	No. 338	Device: QSun 3000	Total duration: 1301h



LAB. ID NUMBER: 27291
POWDER COATING: DS 472
HEAT TRANSFER FILM: --
colour variation (ΔE): **0,34**
residual gloss: **105%**



LAB. ID NUMBER: 27292
POWDER COATING: DS 472
HEAT TRANSFER FILM: 2117/03
colour variation (ΔE): **0,91**
residual gloss: **105%**

Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 1301 hours.

Technical Opinion:

Suitable for OUTDOOR USE

Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment see further analysis on natural exposure in Florida.

Test Report: Accelerated Weathering Test

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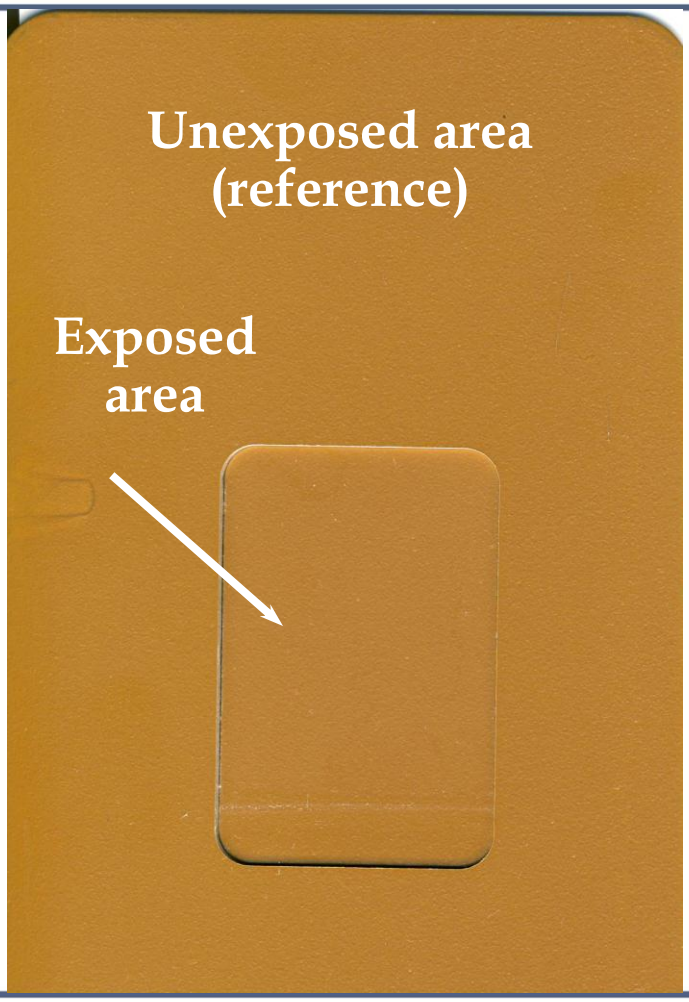
265

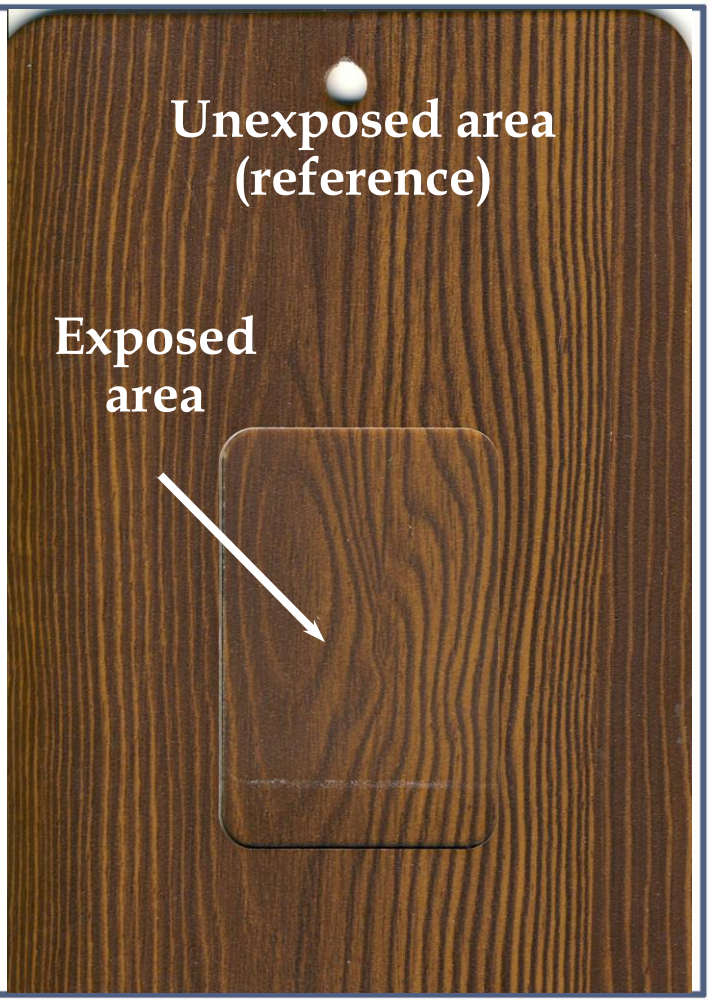
Laboratory Test

No. 341

Device: Solar 3000RHN

Total duration: 1460h





LAB. ID NUMBER: 27297
POWDER COATING: DS 721
HEAT TRANSFER FILM: --
colour variation (ΔE): **0,8**
residual gloss: **77%**

LAB. ID NUMBER: 27298
POWDER COATING: DS 721
HEAT TRANSFER FILM: 2117/02
colour variation (ΔE): **1,3**
residual gloss: **76%**

Technical Remarks

Good residual gloss and very low colour variation (ΔE), after 1460 hours.

Technical Opinion:

Suitable for OUTDOOR USE

Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment see further analysis on natural exposure in Florida.

Test Report: Accelerated Weathering Test

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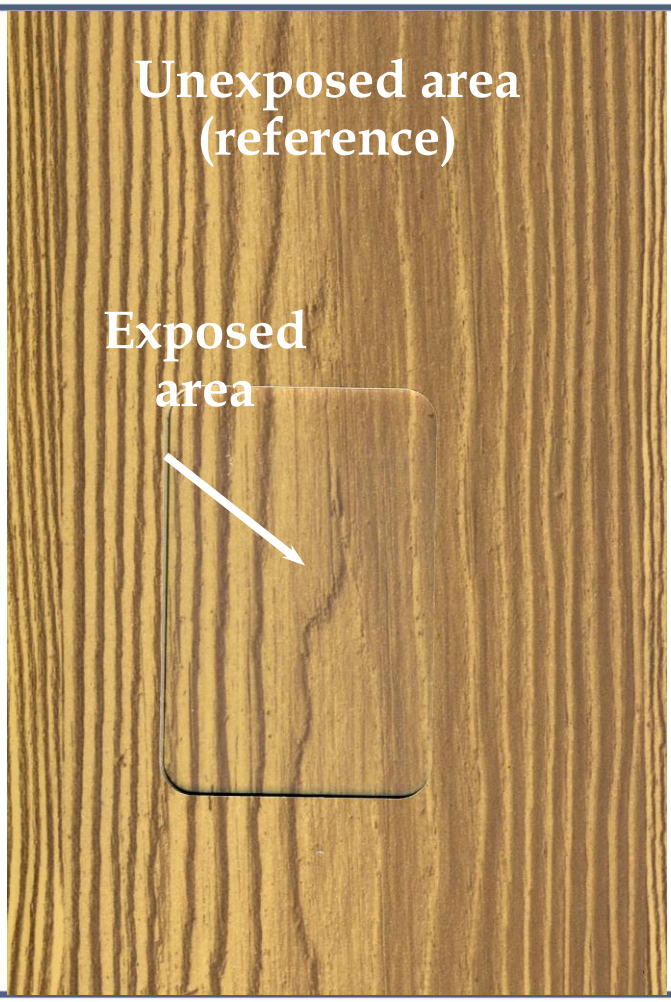
302

Laboratory Test

No. 348

Device: QSun 3000

Total duration: 1094h



LAB. ID NUMBER: 27821
POWDER COATING: DS-0418S
HEAT TRANSFER FILM: 2117/01
Colour variation: **1,63**
residual gloss: **107**

Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 1094 hours on decorated sample.

Technical Opinion:

Suitable for OUTDOOR USE

Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment see further analysis on natural exposure in Florida.