# Accelerated Weathering Test

Decoral LAB
Research and Development


## GLASS
### series

MRK-010-0274

# 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.

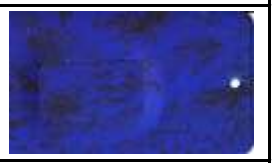
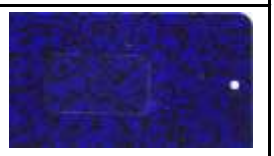
Figure: apparecchiature per l'invecchiamento accelerato.
**Pictures: equipment for the Accelerated Weathering Test**

**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.

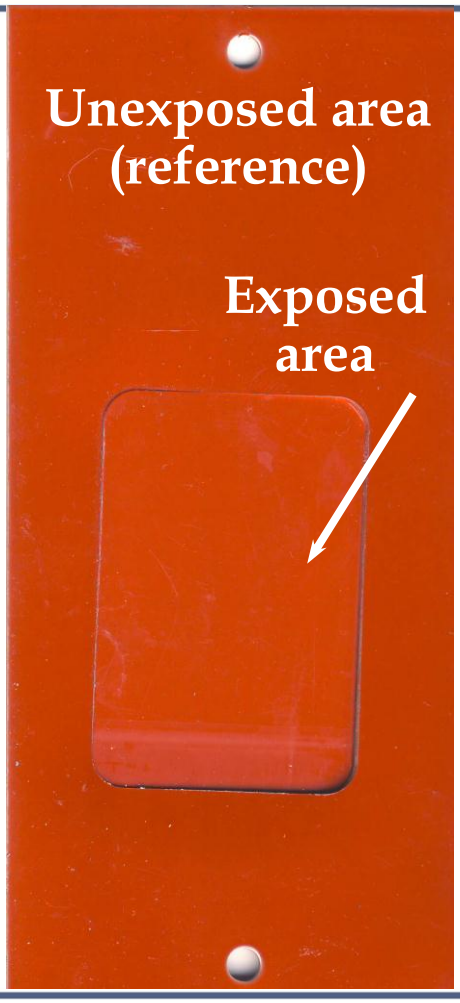
| ID Test Report | PROD. VERNIC | COD. FILM | PROG. N° | IMMAGINI |
|---|---|---|---|---|
| TR-IA-303-2013 | glass-001 | 5026/02 | 303 |  |
| TR-IA-304-2013 | glass-001 | 6048/02 | 304 |  |
| TR-IA-305-2013 | glass-002 | 5007/01 | 305 |  |
| TR-IA-306-2013 | glass-002 | 6047/03 | 306 |  |
| TR-IA-307-2013 | galss-003 | 5007/01 | 307 |  |
| TR-IA-308-2013 | glass-003 | 6052/01 | 308 |  |
| TR-IA-309-2013 | glass-004 | 5026/02 | 309 |  |
| TR-IA-310-2013 | glass-004 | 6044/09 | 310 |  |

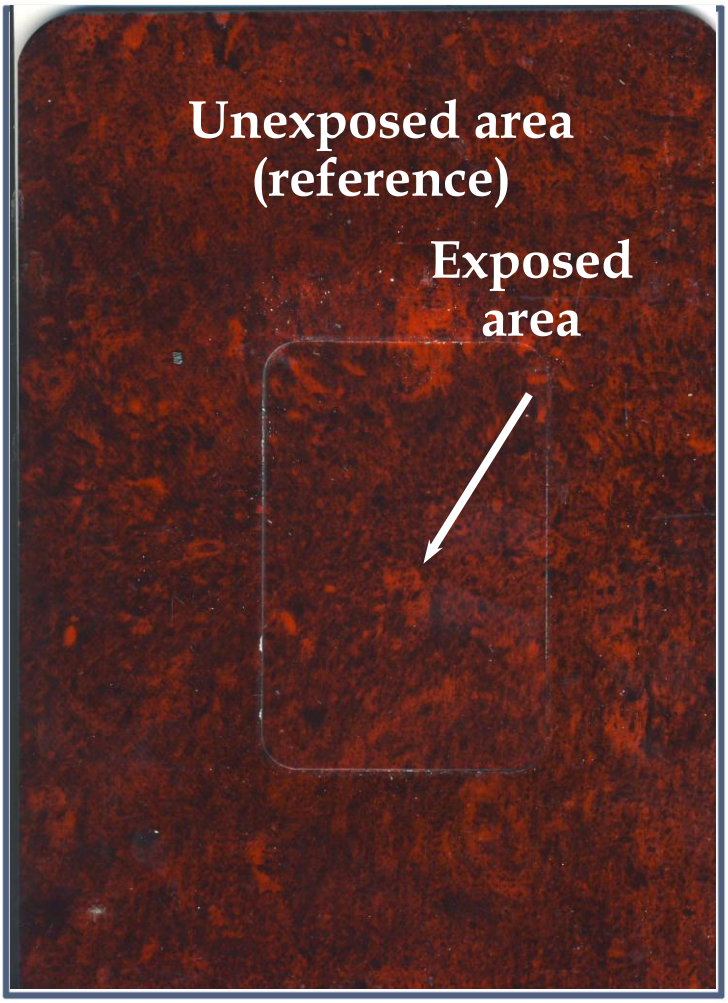
# Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

303

| Laboratory Test | No. 389 | Device: QSun 3000 | Total duration: 944h |
|---|---|---|---|




LAB. ID NUMBER: 30641
POWDER COATING: glass-001
HEAT TRANSFER FILM: --
Grey scale: **5/4**
residual gloss: **101%**

LAB. ID NUMBER: 30612
POWDER COATING: glass-001
HEAT TRANSFER FILM: 5026/02
Grey scale: **5/4**
residual gloss: **111%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 hours.

Technical Opinion:

**Suitable for OUTDOOR USE**

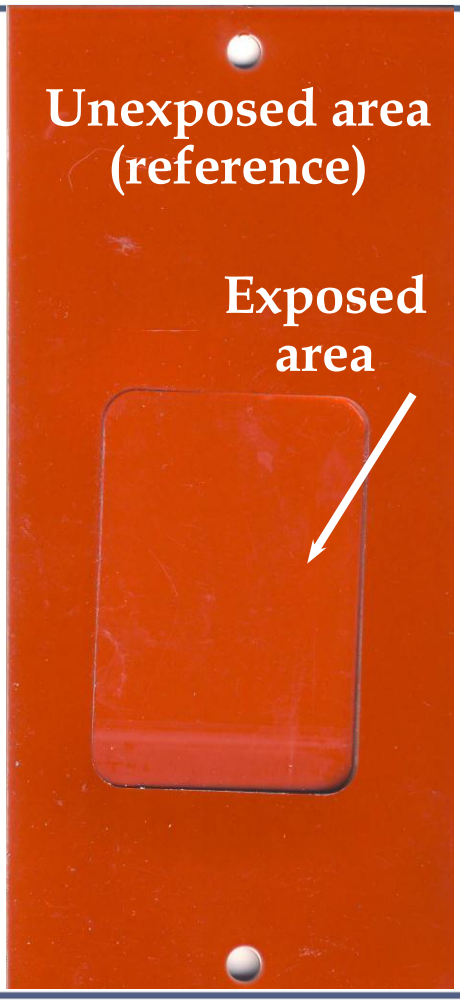
Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment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

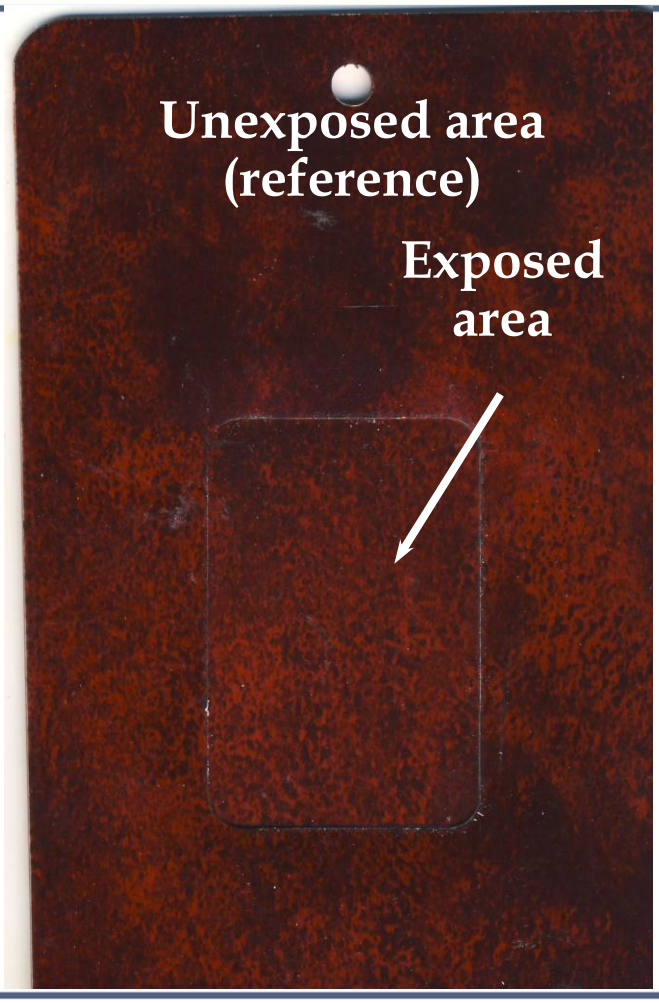
# Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

304

| Laboratory Test | No. 389 | Device: QSun 3000 | Total duration: 944h |
|---|---|---|---|




LAB. ID NUMBER: 30641
POWDER COATING: glass-001
HEAT TRANSFER FILM: --
Grey scale: **5/4**
residual gloss: **101%**

LAB. ID NUMBER: 30615
POWDER COATING: glass-001
HEAT TRANSFER FILM: 6048/02
Grey scale: **5/4**
residual gloss: **100%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 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

Decoral LAB Research and Development

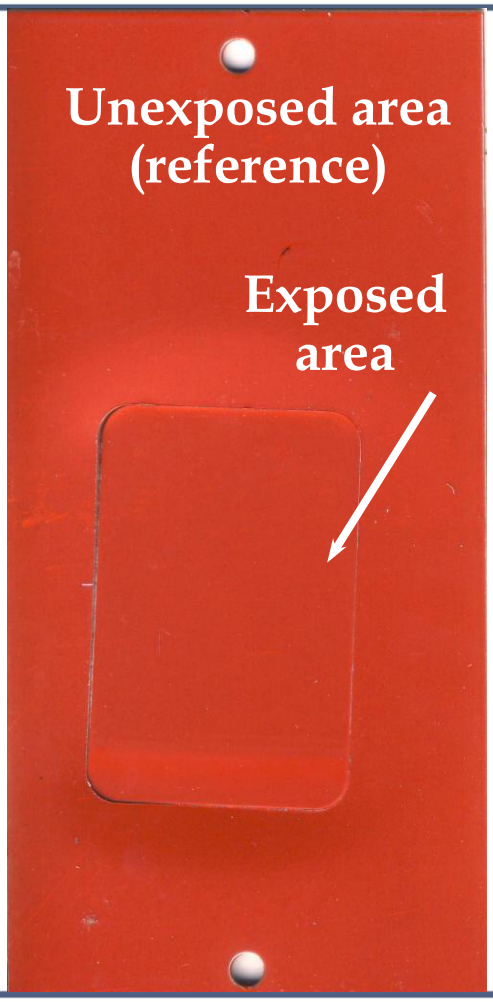
305

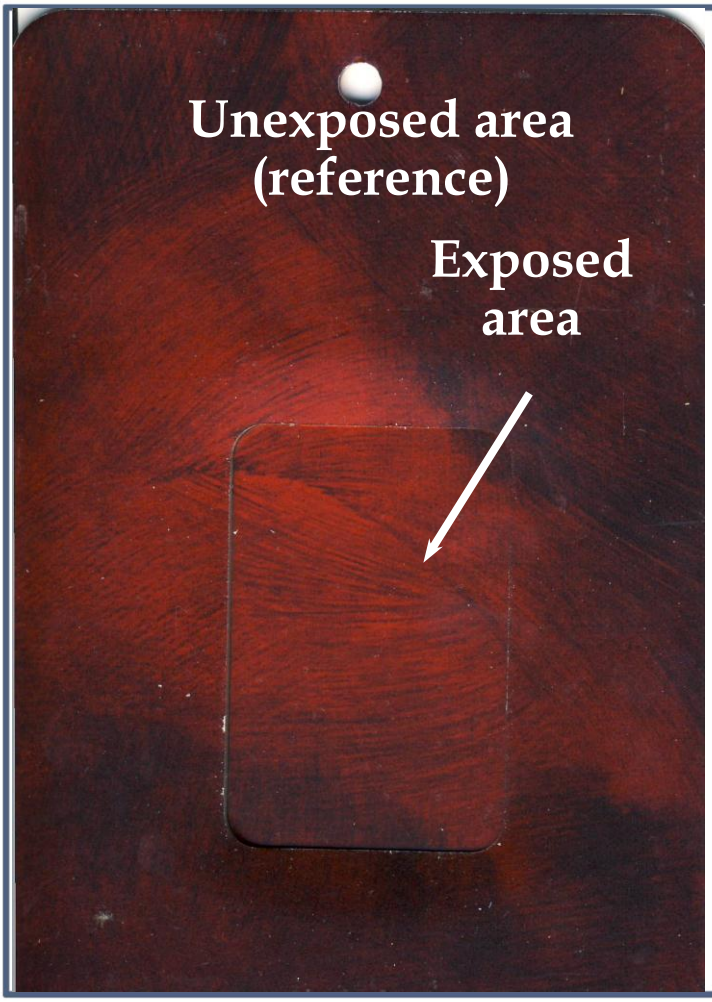
Laboratory Test

No. 389

Device: QSun 3000

Total duration: 944h




LAB. ID NUMBER: 30642
POWDER COATING: glass-002
HEAT TRANSFER FILM: --
Grey scale: **4**
residual gloss: **89%**

LAB. ID NUMBER: 30619
POWDER COATING: glass-002
HEAT TRANSFER FILM: 5007/01
Grey scale: **5/4**
residual gloss: **98%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 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

Decoral LAB Research and Development

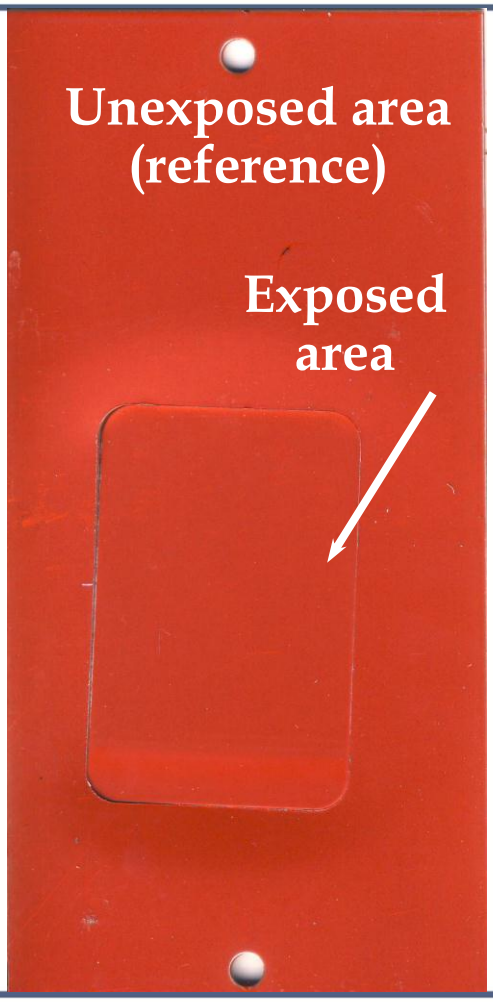
306

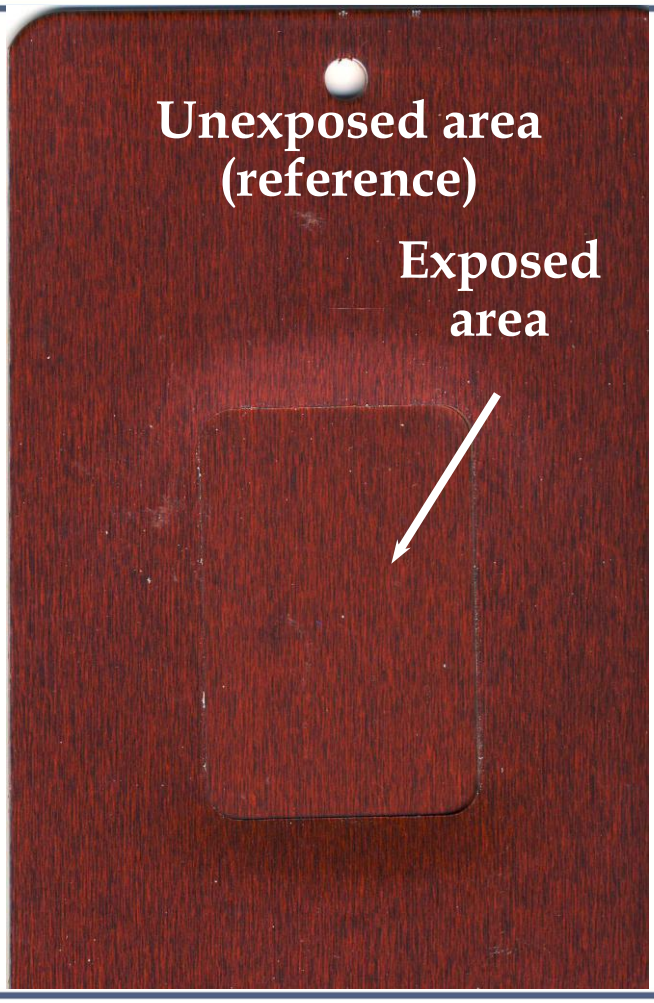
Laboratory Test

No. 389

Device: QSun 3000

Total duration: 944h




LAB. ID NUMBER: 30642
POWDER COATING: glass-002
HEAT TRANSFER FILM: --
Grey scale: **4**
residual gloss: **89%**

LAB. ID NUMBER: 30622
POWDER COATING: glass-002
HEAT TRANSFER FILM: 6047/03
Grey scale: **4**
residual gloss: **95%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 hours.

Technical Opinion:

**Suitable for OUTDOOR USE**

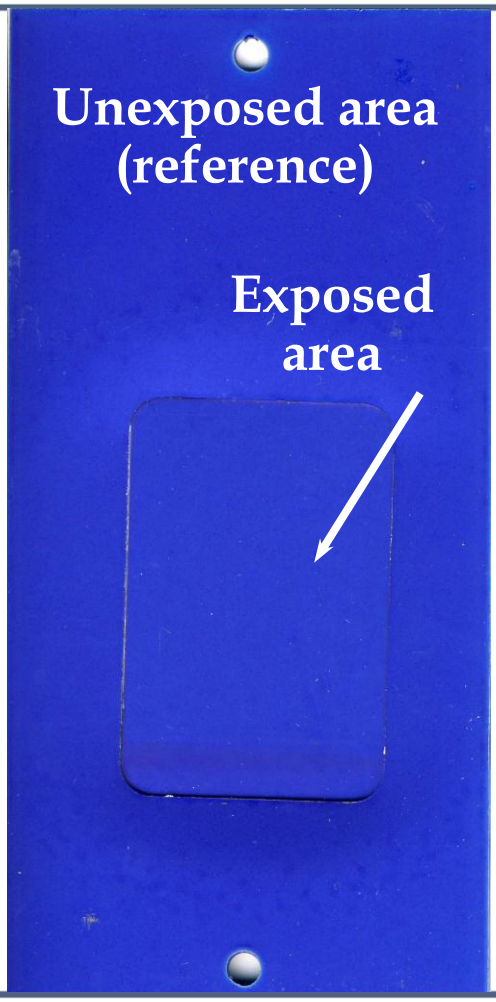
Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment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

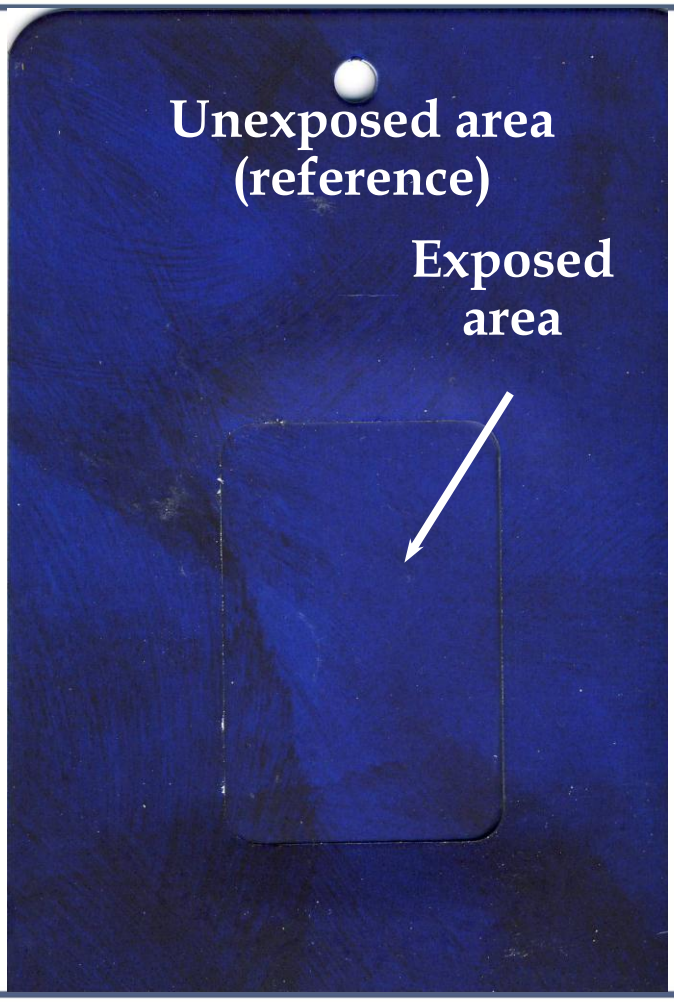
# Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

307

| Laboratory Test | No. 389 | Device: QSun 3000 | Total duration: 944h |
|---|---|---|---|




LAB. ID NUMBER: 30643
POWDER COATING: glass-003
HEAT TRANSFER FILM: --
Grey scale: **4**
residual gloss: **93%**

LAB. ID NUMBER: 30627
POWDER COATING: glass-003
HEAT TRANSFER FILM: 5007/01
Grey scale: **5/4**
residual gloss: **97%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 hours.

Technical Opinion:

**Suitable for OUTDOOR USE**

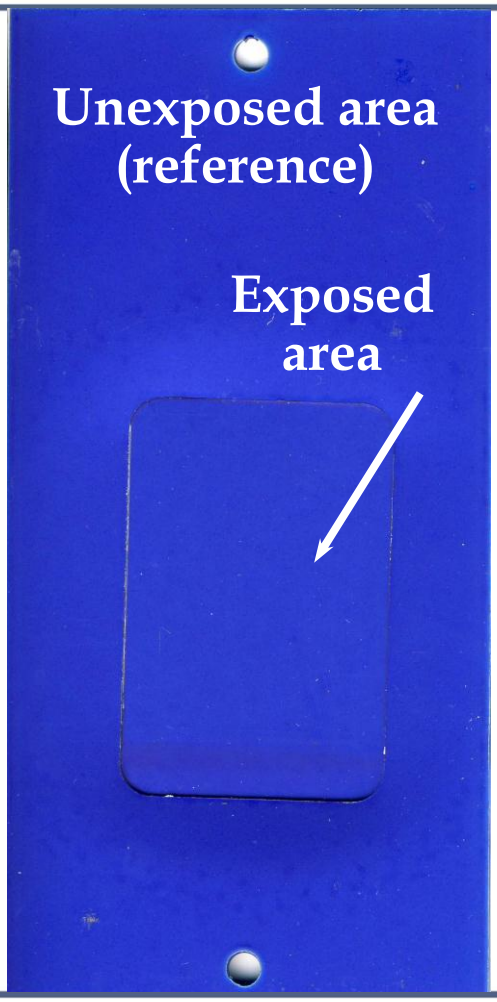
Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment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

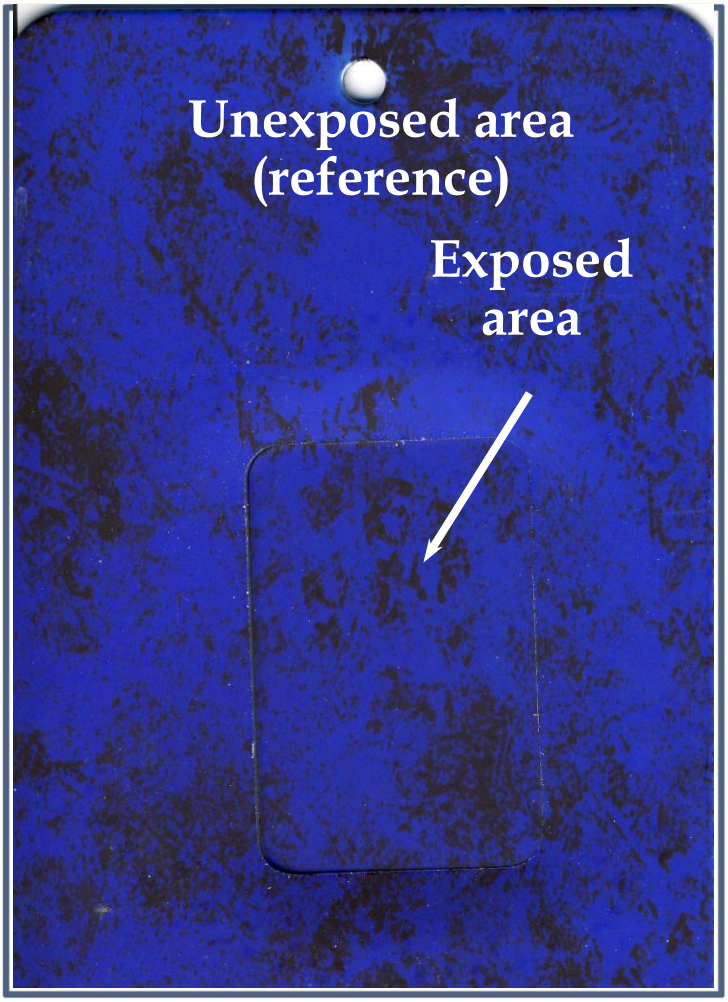
# Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

308

| Laboratory Test | No. 389 | Device: QSun 3000 | Total duration: 944h |
|---|---|---|---|




LAB. ID NUMBER: 30643
POWDER COATING: glass-003
HEAT TRANSFER FILM: --
Grey scale: **4**
residual gloss: **93%**

LAB. ID NUMBER: 30632
POWDER COATING: glass-003
HEAT TRANSFER FILM: 6052/01
Grey scale: **4**
residual gloss: **97%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 hours.

Technical Opinion:

**Suitable for OUTDOOR USE**

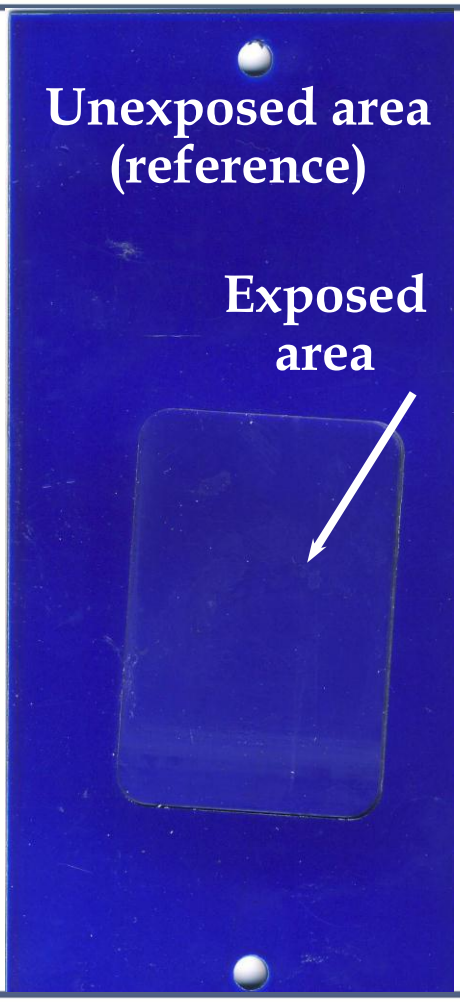
Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment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

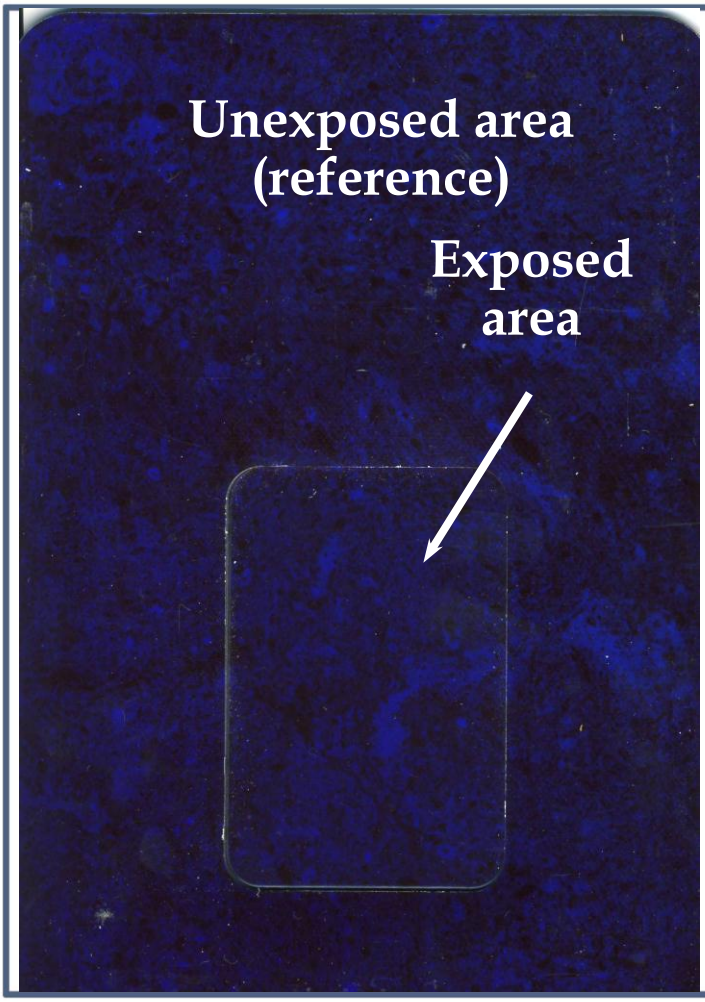
# Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

309

| Laboratory Test | No. 389 | Device: QSun 3000 | Total duration: 944h |
|---|---|---|---|




LAB. ID NUMBER: 30644
POWDER COATING: glass-004
HEAT TRANSFER FILM: --
Grey scale: **5/4**
residual gloss: **75%**

LAB. ID NUMBER: 30636
POWDER COATING: glass-004
HEAT TRANSFER FILM: 5026/02
Grey scale: **5/4**
residual gloss: **96%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 hours.

Technical Opinion:

**Suitable for OUTDOOR USE**

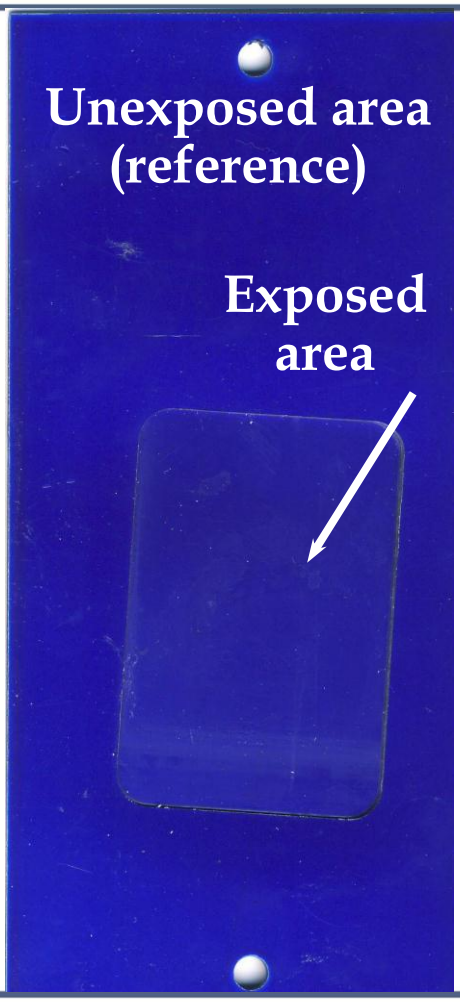
Test was carried on samples prepared according to technical specifications supplied by raw materials manufacturers. However, the resistance against accelerated weathering test is only one of the conditions necessary for the evaluation of the resistance of the finished product. For a final assessment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

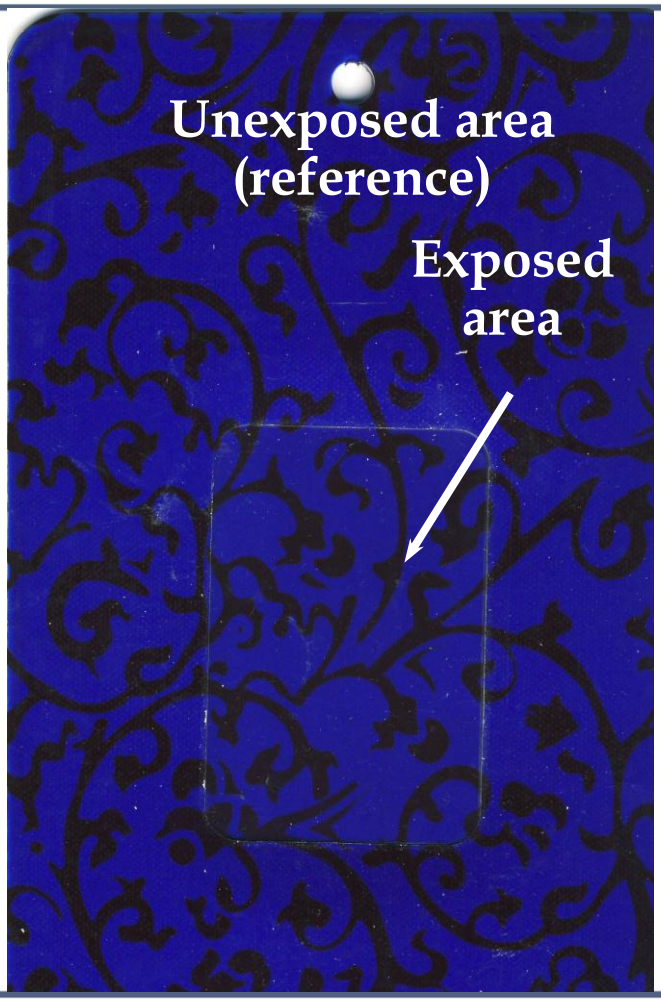
# Test Report: Accelerated Weathering Test

Decoral LAB Research and Development

310

| Laboratory Test | No. 389 | Device: QSun 3000 | Total duration: 944h |
|---|---|---|---|




LAB. ID NUMBER: 30644
POWDER COATING: glass-004
HEAT TRANSFER FILM: --
Grey scale: **5/4**
residual gloss: **75%**

LAB. ID NUMBER: 30637
POWDER COATING: glass-004
HEAT TRANSFER FILM: 6044/09
Grey scale: **4**
residual gloss: **97%**

## Technical Remarks

Excellent residual gloss and very low colour variation (ΔE), after 944 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.