Internationally accredited

**Test report no.:** **71488/06**

**Customer:**

Haogenplast Ltd.
Plastic Industries
42880 Kibbutz Haogen
ISRAEL

**Order:**

Testing of colour fastness after artificial weathering of a PVC membrane for swimming pool.

Artificial weathering according to EN ISO 4892-2 using an Xenon arc source with daylight simulation up to an irradiation dose of up to 6 GJ/m² (3000 h) in the wave length range from 300 nm to 800 nm.

**Letter dated:** 2006-01-05 **by:** Mrs. Nurit Naveh

**Test samples received on:** 2006-01-09

**Test period:** 2006-01-11 to 2006-05-26

This test report comprises 3 pages.

Würzburg, 2006-06-19
Mü/ste

i. V.

Dipl.-Ing. Udo Dengel

SKZ – TeConA GmbH Internationally accredited

i. A.

Wolfgang Ries



SKZ – TeConA GmbH
Testing, Quality Assurance, Certification
Friedrich-Bergius-Ring 22
97076 Würzburg

Managing Director:
Dr.-Ing. Martin Bastian
HRB 7840
Amtsgericht Würzburg

Tel.: +49 931 41 04-0
Fax: +49 931 41 04-273
eMail: info@skz.de
www.skz.de

Deutscher Akkreditierungs Rat
DAP-PL-2005.00
DAP-IS-2005.00

## 1. Order

By letter of January 5, 2006 the company Haogenplast Ltd., Plastic Industries, 42880 Kibbutz Haogen, ISRAEL, instructed SKZ - TeConA GmbH to test the colour fastness after artificial weathering of a PVC membrane for swimming pool.

Artificial weathering according to EN ISO 4892-2 using an Xenon arc source with daylight simulation up to an irradiation dose of up to 6 GJ/m² (3000 h) in the wave length range from 300 nm to 800 nm.

## 2. Test material

On January 9, 2006 SKZ - TeConA GmbH received following test material:

One piece (20 cm x 30 cm) of PVC swimming pool foils

| | |
|---|---|
| Manufacturer of foil: | Haogenplast Ltd., Plastic Industries,<br>42880 Kibbutz Haogen, ISRAEL |
| Designation of foil: | Agam 15L |
| Designation of printing: | Galit 4 |

## 3. Test procedure

Unless otherwise noted testing was performed at a standard atmosphere of 23/50-2 in accordance with DIN EN ISO 291.

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.

Weathering instrument according to DIN EN ISO 4892-2

| | |
|---|---|
| Type: | XENOTEST® BETA LM |
| Radiation source: | Xenon arc radiation |
| Filter system: | outdoor sun light simulation |
| Black standard temp.: | 60 ± 3 °C |
| White standard temp.: | 40 - 45 °C |
| Relative humidity: | 65 ± 5 % |
| Spray cycle: | 18 min. water spray, 102 min. dry period |
| Irradiation energy $E_{UV}$ (300 - 400) nm: | 60 ± 2 W/m² |
| Irradiation dose (300 - 800) nm: | 6 GJ/m² |
| Exposure period: | 3000 h |
| Start: | 2006-01-11 |
| End: | 2006-06-24 |

3.1 Colour fastness, visual assessment

Visual evaluation was carried out according to ISO 105-A02 by using the grey scale for change in colour.

3.2 Colour fastness, colourimetric assessment

The sample colour was measured by means of a spectrophotometer of a wave length area of 380 - 720 nm, standard light type D65, gloss inclusion, 10° normal inspection. It was determined the colour distance $\Delta E^*_{ab}$ according to ISO 7724-3.

The sample was measured before and after artificial weathering at the same measuring position on the sample, upon identical sample placement. Due to that, also in case of the not single-coloured foils with surface texture, a guide value for colour change can be determined in terms of colourimetry.

## 4. Test results

4.1 Colour fastness, visual assessment

Sample reached the fastness grade **3** of the grey scale according to ISO 105-A02.

No stains, bubbles or streaks were found on the surface of the sample.
No crack formation or flake off was found.

4.2 Colourimetric assessment

| Colourimetric assessment | | | |
|---|---|---|---|
| colour coordinates | sample as supplied | sample after weathering | colour distance |
| L* | 64.9 | 71.9 | 7.0 |
| a* | -5.4 | -5.4 | 0.0 |
| b* | -27.0 | -20.2 | 6.8 |
| colour distance $\Delta E^*_{ab}$ | | | **9.8** |