



Internationally accredited  
Testing Institute according to  
ISO/IEC 17025 and DIN EN 45004

**Test certificate no:** 237702/1.2

**Client:** Firat Plastik Kaucuk  
San. ve TIC. A.S.  
Türkoba Köyü P.K.12  
34907 BÜYÜKCEKMECE ISTANBUL  
TURKEY

**Production plant:** 34907 BÜYÜKCEKMECE ISTANBUL  
TURKEY

**Third-party test:** 1<sup>st</sup> half-year 2002

**Product:** Window profiles according to RAL-GZ 716/1,  
section I, part 1, October 1998.

**System:** FIRAT PEN

**Profile description:** Rahmen PR 5110101

**Receipt of samples:** 2002-07-16      **Date of sampling:** 2002-06-07

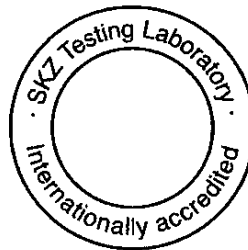
**Result:** The requirements are met.

The test certificate comprises 2 pages.

Würzburg, 2002-09-20  
Br/ste

by order

Volkhard Otte



by order

Dipl.-Ing. (FH) Martin Müller

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Managing Director: Prof. Dr. Burghard Schmitt





**Test report no.:** 71088/05

**Customer:** Firat Plastik Kaucuk  
San. ve TIC. A. S.  
Türkoba Köyü P.K. 12  
34907 Büyükçekmece Istanbul  
TURKEY

**Factory:** 34907 Büyükçekmece Istanbul  
TURKEY

**Order:** Testing of weathering fastness and weathering  
resistance according to RAL-GZ 716/1, section I, part  
1, draft February 2006

**E-Mail of:** 2005-12-21

**Ref.:** Mr Mehmet Erdogan

**Test samples received:** 2005-10-18

**Test period:** 2005-11-22 to 2006-09-26

This test report comprises 5 pages.


Würzburg, 2006-10-12  
Rs/ste

i. V.

  
Dr. Anton Zahn



i. A.

  
Wolfgang Ries

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## 1. Order

On December 21, 2005 the company Firat Plastik Kaucuk, San. ve TIC. A.S., Türkoba Köyü P.K. 12, 34907 Büyükçekmece Istanbul, TURKEY, instructed the SKZ - TeConA GmbH to test weathering fastness and weathering resistance for the production plant Büyükçekmece Istanbul, TURKEY, according to RAL-GZ 716/1, section I, part 1, draft February 2006.

## 2. Test material

On October 18, 2005 the SKZ - TeConA GmbH received the following material for testing:

6 x 1 m pieces of window profile (Türflügel-Außen) made of PVC-U, colour white

Profile name:	97309 DISA ACILIR KILITLI KAPI (TÜRFLÜGEL-AUSSEN)
System name:	WINHOUSE W 60
Marking of profile:	FIRAT A.S. WINHOUSE S 6060 S.I.A.K. KAPI TS 5358 EN 12608 S-II-A 06.10.2005 18:09 -EX-30-1
Formulation:	AKDENIZ KIMYA NP 2407 GX-1
Basis of stabilisation:	Lead
Producer of compound:	Firat Plastik Kaucuk, 34907 Büyükçekmece Istanbul, TURKEY

## 3. Test procedure

The tests specified below were carried out according to the quality and test specifications „**Plastic windows, quality assurance, RAL-GZ 716/1, section I, plastic window profiles**“, Test methods and requirements part 1, Window profiles made of PVC-U, with white surfaces, draft February 2006.

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](http://www.skz.de).

### 3.1 Weathering fastness and weathering resistance

These tests were carried out by means of artificial weathering according to clause 3.12 Test method. Test procedure of artificial weathering corresponds to the requirements according to DIN EN 513, procedure 2, simulation of a temperate zone (S). Outside surface was radiated.





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### Weathering instrument according to DIN EN ISO 4892-2

Type:	Xenon test device 1200 CPS
Radiation source:	Xenon arc radiation
Filter system:	outdoor sun light simulation
Black standard temp.:	65 ± 3 °C
White standard temp.:	45 - 50 °C
Relative air humidity:	65 ± 5 %
Cycle:	6 min. waterspray/114 min. dry period
Radiation energy $E_{UV}$ (300 - 400) nm:	60 ± 2 W/m <sup>2</sup>
Radiation dose (300 - 800) nm:	12 GJ/m <sup>2</sup>
Radiation time:	6107 h
Start:	2005-12-09
End:	2006-06-21

#### 3.1.1 Weathering fastness

##### 3.1.1.1 Visual assessment

The visual assessment was carried out according to ISO 4582 by using the grey scale according to ISO 105-A02.

##### Requirement:

Upon termination of artificial weathering, the colour change must not be greater than allowed by grade 3 of the grey scale according to ISO 105-A02.

The profile shall also be free from stains, bubbles, streaks and cracks and anything that significant damages its appearance.

##### 3.1.1.2 Colorimetric 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.

#### 3.1.2 Weathering resistance

##### Charpy impact strength

The test of the Charpy impact strength was carried out according to DIN EN ISO 179, sample 1fC, but with a residual width of (3 ± 0.1) mm and with the dimensions (50 x 6 x wall thickness) mm.





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Subsequent to artificial weathering the test was carried out at reference samples, which have been stored in darkness, as well as on weathered samples. During testing the weathered surface was subjected to tensile stress.

Requirement:

The mean value of the Charpy impact strength of specimens as supplied shall be at least 40 kJ/m<sup>2</sup> and no single value shall be below 20 kJ/m<sup>2</sup>.

After a radiation dose of 12 GJ/m<sup>2</sup> by artificial weathering the mean value shall not be below 28 kJ/m<sup>2</sup>.

#### 4. Test results

##### 4.1 Weathering fastness and weathering resistance

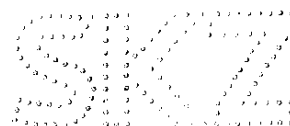
##### 4.1.1 Weathering fastness

##### 4.1.1.1 Visual assessment

The sample reached the fastness grade 4 to 5 of the grey scale. Neither stains, blisters nor crack formations or other significant damages were observed on the surface.

##### 4.1.1.2 Colorimetric assessment

Colour coordinates	Sample as supplied	Sample after weathering	Colour distance
L*	93.0	93.7	0.7
a*	-1.4	-1.2	0.2
b*	-1.4	-0.8	0.6
Colour distance $\Delta E^*$			0.9





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#### 4.1.2 Weathering resistance

Charpy impact strength in kJ/m<sup>2</sup>

Reference sample (non-weathered)		Weathered sample		Change %
$\bar{x}$	s	$\bar{x}$	s	
57.8	1.6	33.2	---	-42.6
10 x partial break (P)		6 x partial break (P) 1 x hinge break (H) 3 x complete break (C)		

$\bar{x}$  = mean value    s = standard deviation

The smallest single value of the reference samples is 55.2 kJ/m<sup>2</sup>

#### 5. Assessment of the test results

The requirements of the item 2.12.1 (weathering fastness after artificial weathering) and item 2.12.2 (weathering resistance after artificial weathering) are met according to RAL-GZ 716/1, section I, part 1, draft February 2006.

