Test evidence for Pilkington OptiShower™

1. Introduction

Pilkington **OptiShower™** is a durable, on-line coated float glass designed to prevent surface corrosion when exposed to water, moisture and humid environments.

It has been extensively tested for durability and performance internally and by independent third parties. This note summarises the tests undertaken along with a summary of the results, conclusions and, where applicable, classification.

2. Independent test evidence

a. Coating durability

Pilkington **OptiShower™** has been independently tested to EN 1096-2 by an EU Notified Body and successfully achieved Class A [1].

EN 1096-2: *Glass in building - Coated glass Part 2: Requirements and test methods for class A, B and S coatings* specifies requirements and test methods related to artificial weathering and abrasion of coatings on glass for use in buildings. These tests are aimed at evaluating the resistance of the coating to attack by simulated natural weathering conditions as well as to abrasion. This attack can be considered as representative of that which could be found on the external and/or internal face of the glazing.

In accordance with this standard, Pilkington **OptiShower™** was subjected to four tests: condensation resistance, acid resistance, neutral salt spray and abrasion resistance. These tests are evaluated by their effect on the visual quality of the product and its spectrophotometric properties. The results are summarised in table 1 below.

Table 1. Results of independent testing to EN 1096-2

Test	Duration	Result
Condensation resistance	21 days	PASS
Acid resistance	5 cycles	PASS
Neutral salt spray	21 days	PASS
Abrasion resistance	500 strokes	PASS
EN 1096 classification		**Class A**

[1] Report reference: Test report No. 171360 Stazione Sperimentale del Vetro S.c.p.A. (Notified Body No. 1694).

b. Corrosion resistance

Pilkington **OptiShower™** has been independently tested for its durability as an anti-corrosion coated glass by IFT Rosenheim [2].

Samples of Pilkington **OptiShower™** were subjected to high humidity and temperature load as part of a long-term test lasting 76 days.

Initial light transmittance and light scattering transmission measurements were performed both before and after climate testing using a spectrophotometer with an integrating sphere. The evaluation showed that the values of light transmittance (0.90) and scattered transmittance (0.01) remained unchanged within the measurement accuracy.

In addition to the scattering measurements, the samples were visually assessed using a light microscope on a weekly basis and at the end of the full test duration. There were no signs of corrosion of the coating, even after 76 days.

[2] Report reference: Test report 16-003308-PR01 (PB-01-H03-07-de-02) dated 20.08.2019, IFT Rosenheim GmbH.

c. Resistance to chemicals and stains

Pilkington **OptiShower™** has been independently tested for resistance to chemicals and stains in accordance with the European Standard for shower enclosures.

EN 14428: *Shower enclosures – Functional requirements and test methods* specifies requirements for shower enclosures for domestic purposes. Pilkington **OptiShower™** was tested for its resistance to chemicals and stains in accordance with EN 14428, which requires exposure to cleaning agents from five families: acids, alkalis, alcohols, bleaches and staining agents. After the test, there were no visible differences between the areas subjected to chemical attack and the unexposed areas. No stain or deterioration of Pilkington **OptiShower™** was reported.

3. Internal test evidence

Pilkington **OptiShower™** has been subjected to internal laboratory tests at the NSG Group Technology Centre in the UK.

Laminated samples of Pilkington **OptiShower™** and Pilkington **Optifloat™** Clear (as reference) were exposed to an accelerated weathering test at an elevated temperature and high Relative Humidity for a period of 1900 hours. Haze measurements were undertaken in accordance with ASTM D 1003 [3] before and after testing, including after 23 days of exposure. The results are summarised in Table 2.

Table 2. Average increase in haze measured after 23 days of exposure

Product	Increase in haze
Pilkington **OptiShower™**	0.02
Pilkington **Optifloat™** Clear (reference)	10.91

The results show that, whilst there was a substantial increase in haze measured on the Pilkington **Optifloat™** Clear reference samples even after only 23 days, there was very little difference in haze before and after testing for Pilkington **OptiShower™**. This demonstrates the improved clarity and reduced haze achieved with Pilkington **OptiShower™** compared with ordinary clear glass in a shower environment. This can be seen in the photographs taken after testing (see Annex A).

[3] ASTM D 1003: Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics. Haze is defined in this standard as: *'In transmission, the scattering of light by a specimen responsible for the reduction in contrast of objects viewed through it. The percent of transmitted light that is scattered so that its direction deviates more than a specified angle from the direction of the incident beam.'* In general, the higher the level of the haze, the more difficult it is to see through the glass.

Annex A. Photographs of Pilkington **OptiShower™** and Pilkington **Optifloat™** Clear samples after humidity testing