

T e c h n i c a l

I n f o r m a t i o n

Assessment of the

visual quality of
digital print with
DesignJet



**FLACHGLAS
WERNBERG**

TI WER 012 E

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<p>Technical Information</p> <p>Assessment of the visual quality of digital print with DesignJet</p>
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Scope of validity

This guideline shall apply for the assessment of the visual quality control of completely or partially digitally printed glass panes which manufactured as heat strengthened glass or toughened safety glass by application and burning-in of ceramic colours.

This guideline relates shall apply for all products, which are manufactured in the digitally printing facilities of FLACHGLAS Wernberg GmbH.

The tolerances defined in this guideline shall be particularly valid in those cases, in which no specific agreements (drawings, technical delivery specifications etc.) regarding the products to be manufactured have been made between the customer and FLACHGLAS Wernberg GmbH.

The individual panes of the double glazed unit have to be evaluated separately with regard to the specified characteristics.

Digital printing process

During the digital printing process the design is made with the support of a graphics program. The colour is directly applied to the glass surface by a print head through a plotter (Bubble Jet procedure), whereas the quantity of the colour application can vary slightly. The colour application is opaque or translucent, depending on the colour chosen, and similar to the screen-printed colour application, however, definitely thinner than with the rolling or casting process.

The print resolution is 360 dpi.

Please note that any medium (sealant, panel adhesive, insulation, etc.) which is directly applied to the colour side, will shine through light colours.

If digitally printed panes are intended for a use in look-through areas, this must be discussed in advance with FLACHGLAS Wernberg GmbH, followed by a sample approval.

Typical for the production process are slight streaks, especially on the colour surface in the printing direction, which may be visible in transmitted light when using light colours.

The print edges in the printing direction are absolutely straight, whereas diagonally to the printing direction they are slightly scalloped. Print designs made of dots, holes or texts show a scalloped print edge which, however, can only be recognized from the nearest distance.

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Test specification

The printed glass is to be judged from the unprinted side – colour on position 2 (both, for the judgement of flaws and faults, as well as of the colour). If special installation instructions exist, these must be included in the order.

Checking is conducted under diffuse daylight conditions from a distance of approx. 3 m with reflection, without direct insolation or counter-light.

Panes ordered to be used as elements for looking through are checked from both sides under the testing conditions as described above. (This application case has to be clarified with FLACHGLAS Wernberg GmbH beforehand, and it has to be indicated in the order).

Product features

Edge processing

According to the customary standard examining criteria of DIN 1249, part 11.

Surface and glass characteristics

Glass for building purposes: according to the guidelines for the assessment of the visual qualities of heat strengthened or toughened safety glass or the visual qualities of enamelled and of screen printed glasses. Available form:

Bundesverband Flachglas Großhandel, Isolierglasherstellung, Veredelung e.V.

Mülheimer Straße 1

53840 Troisdorf

www.bf-flachglasverband.de

Printing

The printing must be carried out so that a visually fault-free general impression is ensured. Water stains, bright spots, colour smudging, spattering of colour and cloud formation are inadmissible in the view field of the pane.

There are slightest colour splatters right next to the print design which are caused by the printing process (Bubble Jet) and only visible with a magnifying glass placed right in front of it.

Colours

The final colour control and release has to be done with a glass sample, not via colour charts or electronic media.

Colour appearance:

The digital print is usually carried out on float glass, according to the standard specification. The colour decision should absolutely be made by a colour sample, as the printed glass pane may, due to its inherent colour (depending on the glass thickness) and its reflection on the glass surface, give a divergent colour impression.

Subtle shifting in design or colour on structural and coloured glass are possible, due to the production process. If printing is done on the satinated side of the glass pane, slight print blushing may appear at the print edges due to colour running.

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Storage

Digitally printed glass panes are particularly sensitive to corrosion when stored in stacks with intermediate layers under longer exposure to humidity. The panes are therefore to be absolutely protected from moisture/humidity during transportations and storage.

Weathering resistance

The printing is as far as possible scratch resistant and acid resistant; the light-fastness and adhesive strength correspond to the permanency of ceramic enamelled colours. Weather resistance (outdoor installation) of the digitally printed glass is greatly influenced by environmental conditions. Glass- and glass-enamel surfaces may already become unsightly after few month (loss of brilliance of the colour surface), depending on the rain intensity and the air pollution by aggressive substances, such as SO₂, NO_x and airborne dust. The assessment of the weather-proof characteristics of ceramic glass colours is a complex subject which cannot be answered flatly. The reason for this is the fact, that every ceramic glass system, just as uncoated float glass also, can be more or less vigorously impacted by environmental influences.

The DELODUR® Design Email-digital print must only be applied to position 2 or within the laminated unit composition. All the tested colours used by FLACHGLAS Wernberg GmbH in the digital print process are resistant according to the manufacturer's instructions.

By using very translucent colours, slight scratches, traces of water drips or contamination on the print may, even printed on position 2, become visible respectively leave traces of corrosion!

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Permitted characteristics:

Point blemish characteristics	<p>$\varnothing < 0.5$ mm are not assessed</p> <p>$\varnothing 0.5 - 1.0$ mm max. 3 ea. per m² with spacing of ≥ 100 mm</p> <p>$\varnothing > 1.0 - 2.0$ mm max. 1 ea. per pane.</p>
Burnt-in foreign bodies (fluff, hairs etc.)	Permissible up to a length of 10 mm (widths max. 0.5 mm)
Digital print characteristics	Colour splatters resp. scallops on the print edges are allowed.
Tolerance of the print position Print size: ≤ 200 cm	
Edges, seamed	± 2.0 mm
other edge finishing	± 1.0 mm
Print size: > 200 cm	
Edges, seamed	± 3.0 mm
other edge finishing	± 2.0 mm
Seamed edges:	all-round 3 mm, all misprints allowed.
Other edge finishing:	The edge area must be visually clean on fully and partially printed panes. The edge spacing of the link coating to the glass edge must not exceed 2 mm \pm 1 mm. Ink projections are not permissible.
Drilling holes:	In the case of holes, a clearance of 2 mm from the printed edge to the hole edge is permissible.
Printing, general:	The contours of the printing have to end cleanly. Prominent saw teeth are not permissible. Prominent starring effect, heavy blade traces, wipes etc. are not permissible.
Multiple printing:	In the case of multiple printing, sampling is essential (± 1 mm offset tolerance).

This technical information

superseeds all previous editions

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