

## Screen printing and flood coating



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### GLASS PAINTING

Glass painting and printing is done using four basic technologies:

- flood coating using coaters
- screen printing
- spraying
- UV digital print

We use only tested and properly selected paint to ensure the best possible quality to our Clients: a satisfactory visual effect and durability of prints.

### UNLIMITED POSSIBILITIES

When it comes to glass printing and painting, the only thing that restricts us is our imagination. We use the comprehensive, publicly available catalogs of files and graphics (e.g. [Fotolia.pl](https://fotolia.pl)), private archives, works by external artists, but mostly we work with materials provided by our Clients. The countless combinations of patterns, colors, glass, foil, and various kinds of ceramic enamel paint (opaque and transparent) are a great opportunity for designers, architects, and amateur interior decorators to show off their skills.

### APPLICATIONS

Painted and printed glass can be used virtually anywhere: from minor decorative and furniture details to interior decor elements, partition walls and wall linings, to heavy safety glass used in balustrades, barriers, elevator panes, glass stairs, floors, and landings. It can also be – and increasingly is – used in avant-garde architecture for glassed-in facade elements (second skin, glass



lamellas), where it offers additional protection against the sun, as well as in skylights and glass canopy roofs.

### WHY PAINTED GLASS FROM DUBIEL VITRUM?

We have many years of experience in painting glass. We are always experimenting and trying out new solutions. We can match the production technology to the effect desired by the Client. We offer:

- an unlimited choice of screen print patterns
- a wide range of colors for water based and glaze enamel paint
- painting and printing on any shape
- high durability of print layers
- resistance to atmospheric factors
- high mechanical resistance to bending
- high resistance to thermal stress

### DUBIEL VITRUM PAINTED GLASS AND COMPLIANCE WITH POLISH AND EUROPEAN STANDARDS

To meet the needs of the market and our Clients, we have tested and certified the Dubiel Vitrum family of painted and printed glass, e.g. with UV prints inside the laminate, painted with glaze enamel paint on the inside of the laminate, and painted with glaze enamel paint on the outside. The tests were conducted by the Institute of Ceramics and Building Materials, and our glass passed them with flying colors. The above-mentioned printed glass produced by Dubiel Vitrum complies with the PN-EN ISO 12543, PN-EN 12600, and PN-EN 14449 in terms of the resistance to UV radiation, humidity, high temperature, and mechanical damage.

## PRODUCT TECHNOLOGY

Depending on the paint type, we distinguish two kinds of printed and painted glass products:

1. glass pieces painted with glaze enamel paint cured during the glass tempering process (emalites)
2. glass pieces painted with water based varnishes or chemically curable paint (solvent paint)

## PRODUCT CHARACTERISTICS

**depending on the type of paint used**

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**Glaze enamel paint**

- **glaze enamel paint is a specialized thermally curable ceramic paint (cured in glass tempering)**
- **painted pieces are tempered, which dries them and some of the paint fuses into the surface of glass, creating a hard layer that is difficult to remove mechanically or chemically**
- **glaze enamel paint is durable and environment-neutral**
- **glass painted with glaze enamel is a great decorative element**
- **glass retains all of the characteristics of tempered glass and meets the Polish construction standards**
- **the actual color of enamel can be determined by looking at a cured sample on glass. The surface of enamel should be seen through the glass. The shade of glass greatly impacts the final color of an enameled piece**
- **non-transparent panes should be visually assessed against a dark backdrop**
- **in black paint, due to its characteristics and chemical composition, there may appear spots that let light through (the so-called “starry sky” effect - this does not diminish the visual quality of enameled glass)**
- **all enamel faults invisible at 1m are considered permitted.**

**Water based varnishes and paints (solvent)**

- all-purpose paint with good adhesion and chemical resistance
- characterized by high mechanical resistance and great glass adhesion
- a wide choice of RAL colors
- varied decorative effects
- varnish dries at room temperature or in a furnace at 50-70°C (fast drying)
- can be further processed after paint is cured (cures in 5 to 7 days, depending on the conditions)
- chemically curable paint (solvent paint), after being cured with the other component, creates a surface resistant to high temperature and chemicals, which can be mat or shiny, depending on the curing agent used

## **Glass painting techniques:**

### **1. FLOOD COATED GLASS (COATER)**

Glass is flood-coated in a custom-made machine that ensures a high quality of painted surfaces. A glass piece is placed horizontally between pressure rolls – on one of them there is a precisely dosed amount of paint. By applying exact pressure of the rolls onto the material, the paint is transferred from the roll onto the glass, ensuring an even layer of paint on the entire painted element.

The coater makes it possible to paint only the entire surface of a glass piece.

## TECHNICAL TERMS OF REFERENCE FOR COATER PAINTING AT DUBIEL VITRUM

### paint types used

- glaze enamel paint
- water based varnishes

### glass thickness

4 - 100 mm

### minimum piece size

not shorter than 300 mm

### maximum piece size

3,200 x 1,560 mm

### movement speed

max. 6 m/min.

### minimum amount of paint needed to start up the machine

- 3 kg
- 2 kg for short pieces (up to 1 m)

### chamfered pieces

pieces can be only painted on the side of the chamfer (this rule does not apply if the piece is chamfered on two opposite sides)

### applying several layers of paint

- chemically curable water based paint - YES
- glaze enamel paint - only in special cases (needs to be consulted with Sales)

### anti-slip paint

YES - large batches (needs to be consulted with Sales)

### pattern painting

YES - needs to be consulted with Sales

Patterns can be painted. Non-painted places are covered with foil (as for sandblasting) which is torn away after the paint is dry. ATTENTION: the edges of such a pattern may be slightly serrated.

## 2. SCREEN PRINTING

In screen printing, glass is covered with special paint pressed through a dense screen, which is partly covered with light-sensitive emulsion in the shape of a specific pattern. This technique makes it possible to paint various types of light-exposed patterns, as well as entire surfaces.

A screen print pattern may cover just a small part of the pane or the entire surface. If more than 50%



of the pane is covered with screen print or coater-painted, the result is enameled glass. If only a part of the pane is covered with the pattern, we get decorative transparent glass.

### TECHNICAL TERMS OF REFERENCE FOR SCREEN PRINTING AT DUBIEL VITRUM

#### paint types used

- glaze enamel paint
- chemically curable paint (solvent)

**glass thickness** 4 - 19 mm

**minimum piece size** 100 x 100 mm

**maximum piece size** 3,000 x 1,700 mm (table size)

**maximum print area** 2,500 x 1,500 mm

**maximum screen size** 3,200 x 2,200 mm

**applying several layers of paint** in special cases (needs to be consulted with Sales)

**anti-slip paint** YES

**multi-colored patterns** YES

**satin paint (etching imitation)** YES

**multi-tonal patterns** YES (raster printing)

**smallest dot** pattern elements must not be smaller than 1 mm (this value is a generalization; depends on the paint and screen used – in favorable conditions, it may be lower than 0.5 mm); this rule applies also to raster dots

### 3. SPRAYING - AIRBRUSH PAINTING

In spraying, paint is transferred onto the material using an airbrush – the material is usually covered entirely, but in special cases it is possible to produce simple patterns (frame, rectangle, etc.) after consulting with Sales.

### TECHNICAL TERMS OF REFERENCE FOR AIRBRUSH PAINTING AT DUBIEL VITRUM

**paint types used**

- water based varnishes
- thermally curable glaze enamel paint
- polyurethane paint

**glass thickness**

no limits

**minimum piece size**

no limits

**maximum piece size**

2,000 x 1,000 mm

larger sizes possible – needs to be consulted with Sales

**applying several layers of paint**

- water based varnishes – YES
- glaze enamel paint – NO
- polyurethane paint – YES

**anti-slip paint**

not recommended

**satin paint (etching imitation)**

not recommended

**pattern painting**

Patterns can be painted. Non-painted places are covered with foil (as for sandblasting) which is torn away after the paint is dry. ATTENTION: the edges of such a pattern may be slightly serrated.

**other irregularities**

coat thickness may vary

**FLAWS AND HAZARDS**

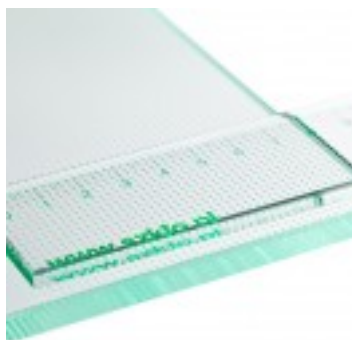
Glass painting and printing is subject to its own laws – as a chemical product, paint has its own peculiar properties that cannot be always overcome. On the other hand, every paint application technique has different characteristics, as a result of which the opinions about the coat of paint tend to vary greatly. Finally, let us note that glass has its depth and color, which makes the same paint color look different depending on the glass type and thickness, as well as on the viewing conditions (light, backdrop).

Taking the above into account, let us keep a few things in mind:

1. The assessment of painted glass is subjective and depends on tastes and circumstances related to the way glass is built in/application.

2. Color repeatability (invariance) cannot be guaranteed
3. Opinions on the quality of the coat of paint vary depending on application techniques and the number of layers.

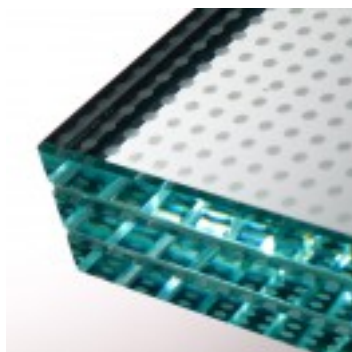
Taking into consideration the above flaws and hazards, the Client should consult the details with Sales before commissioning printed or painted glass (e.g. by giving information about whether the glass will be viewed against the light, whether it will be a transparent element or a non-transparent detail permanently glued to a flat surface, etc.).



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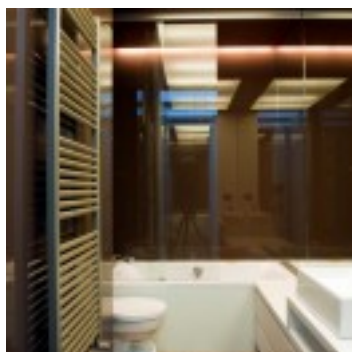
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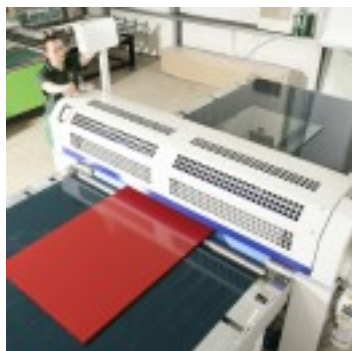
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<https://dubielvitrum.pl/en/offer/special-glass/products/screen-printing-and-flood-coating.html>

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