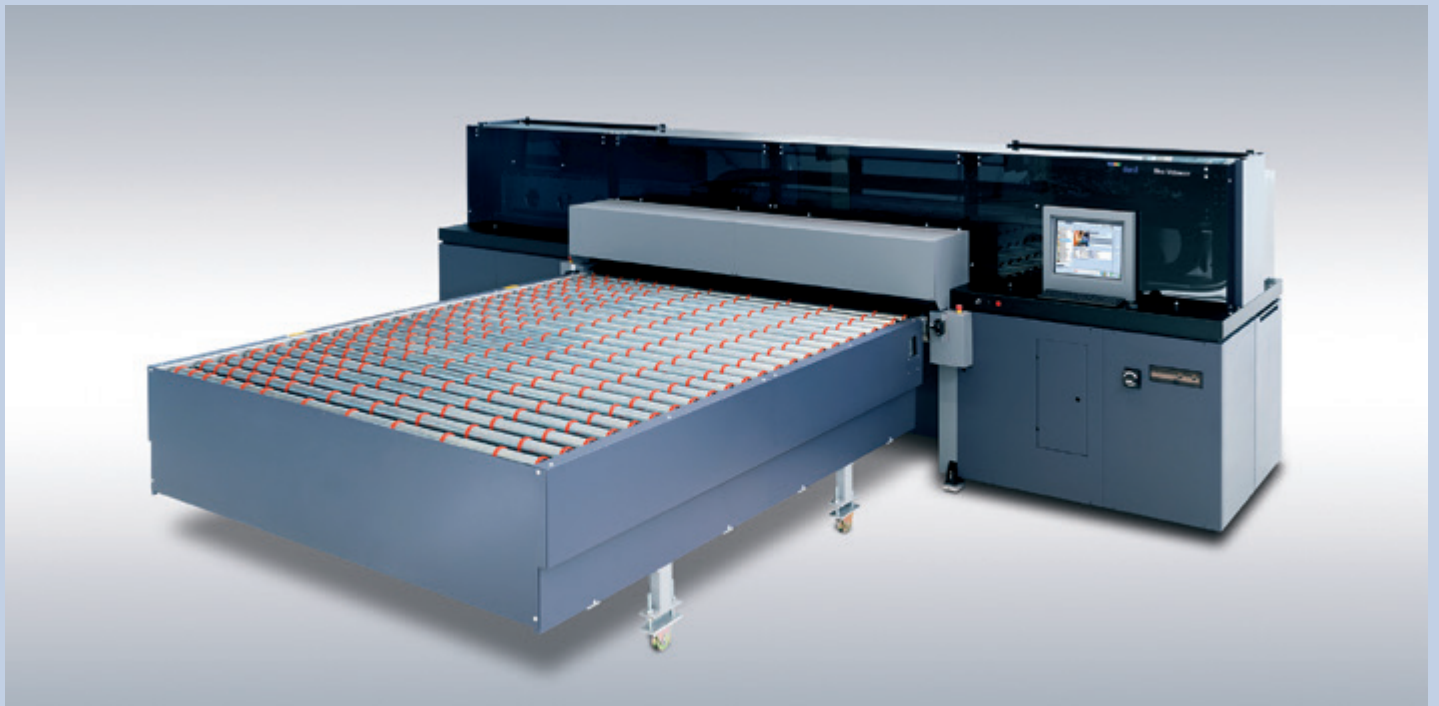


Rho Vetrocer 250

Digital inkjet print system for the glass and facades decoration



Durst, the industrial glass decoration specialist

From the combination of perfected software, innovative technology of inks with inorganic pigments, status of art printheads and inkjet print, which Durst has been studying for over 15 years and which has been used in its industrial print systems, an innovative print system for the glass decoration is born.

Beyond being compliant to regulations governing the usage of glass in house buildings, such system offers the possibility to designers, interior designers, architects and glass manufacturing companies to create new creative shapes.

Digital inkjet print, thanks to which for the last decade Durst has revolutionized the tile printing market all over the world, enables to print quickly without overprinting, and at convenient prices, protection borders of various dimensions onto structural glass planes, glass doors, divider walls, surfaces behind cook planes, elevators or other machine coatings.

The Durst Flow technology keeps a constant circulation of ceramic inks inside the printheads thus avoiding nozzle clogging as new ink to be pumped right behind the nozzle: with ceramic inks having a high pigmentation degree and a part of frits this will form a critical sedimentation and the ink drying at the nozzle.

The extremely precise sled guide on electromagnetic movement fields, bionic supports made of special aluminium and silica alloy, the belt advancement, the fibreglass electronics, the workstation Linux software and the solid rack structure are already being used since decades in over 2500 machines on the market.

Durst machines are already proven in the industrial market: they are built and manufactured in a reliable way for a 24/7 operation. They can be embedded in existing glass production lines or used as independent and totally automated production lines.

Durst Rho Vetrocer – the opportunity to access a growing market in a remunerative way.



Durst. The industrial inkjet specialist



Durst Research Center in Lienz



Durst Industrial Inkjet Application GmbH Lienz

Since 1935 Durst is active in the visual communication field and in imaging technology: up to 1995, in analogue photography with silver halide for the camera manufacturing, enlargers, slide projectors; since 1995, as the leader manufacturer of a laser exposition device in digital printing.

Durst started in 1999 developing large format inkjet printers for the advertising field: in 2000, Durst was the first company to market a flatbed printer using UV inks, printer which at the moment has reached its 8th generation:

Innovations relate to resolution (now higher than 1700 dpi), drop size (now 7 pl), variation of the drop dimensions (greyscale technique), print speed, colour system (from UV inks to ceramic and water based inks), software and electronics. With print systems embedded into industrial applications for the tile production, the textile and label and packaging print fields, Durst possesses now a longstanding experience in a field where manufacturing conditions are extremely severe.

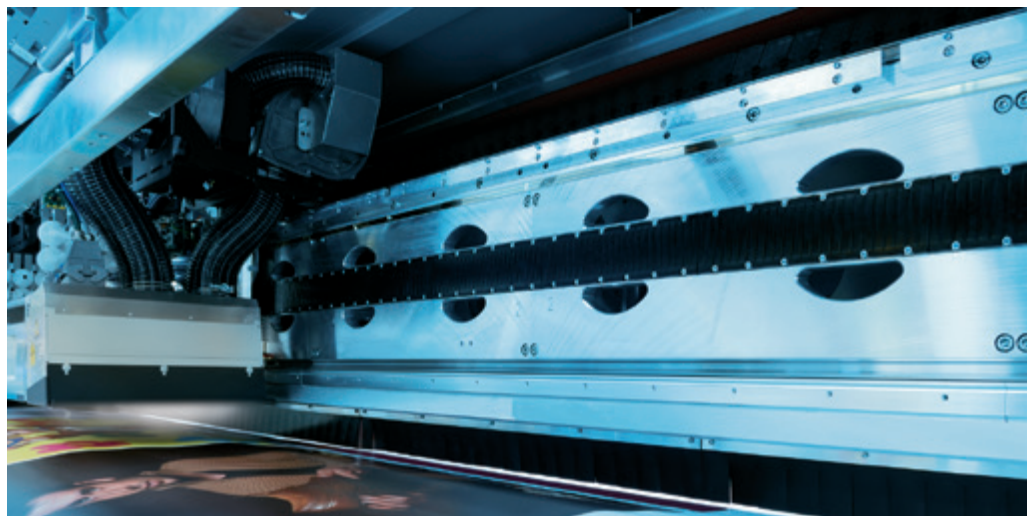
Among these skills there are construction robustness designed for 24/7 operation, remote control of functions, MIS integrated software for the economic surveillance of the ink and manufacture time usage, which are being used since years by Durst machines.

Durst was awarded the ISO-9001 and 14001 certification and is always devoted to sustainability: our products, beside being manufactured according to sustainable methodologies respecting all regulations related to the health and safety of environment, guarantee the user a high degree of long-lasting, reparability, updating to the most recent technology, low ink and power usage, and the total absence of substances harmful for environment during the printing process.

According to Durst, the inkjet print intended as a production technique of functional surfaces without contact is the technology of the future. That is why the Research Center, built in 2010, is dedicated to the newest printheads, inks, as well as fluids and filtering techniques.

By participating to various research projects within the 7th European program, as experts in inkjet technology, we guarantee to offer the most advanced and innovative technology ever.

Components of the Durst technology



Variodrop and Circular-Flow (CF) Printheads

Starting in 2003 Durst is active in the tile printing with inorganic pigments. Metallic pigments, which must have a specific dimension in order to produce solid colours after the baking process, tend to deposit sediment. Continuous circulation of the ink inside the system, without "bags" and accumulation toward edges and thanks to an intelligent filtering technique enables the inks system to be promptly ready to use, without problems and costly "capping".

This ten years experience, denominated Circular-Flow-System by Durst, has been applied to the Rho Vetrocer.

Printheads are positioned in such a way that the ink constantly circulates right behind the nozzle: by this design the ink will never condensate, evaporate or sediment as nozzles are always pumped with new ink, cleared from oxygen micro bubbles.

The other extraordinary printhead technology is called Variodrop: according to the raster image data, the piezoelectric electronics create smaller or bigger drops. As opposed to the grey scale technique, which produces drops of exactly identical dimensions which get together forming a bigger drop right before the impact, thus considerably reducing the print speed, in the Variodrop technique small, medium or big drops are produced directly into the printhead nozzle, thus minimally affecting the print speed.

Magnetic linear transmission – bionic supports – transport belt

The milled aluminium alloy sled, onto which printheads are mounted in a mirrored composition and then calibrated through a computerized adjustment system, moves with a magnetic linear transmission applying a constant speed to the sled along the entire print width. This, together with the electronics of the power-on and the data transmission impulses and the belt technique, it is responsible for the print results and it guarantees a tolerance of 2 micrometers.

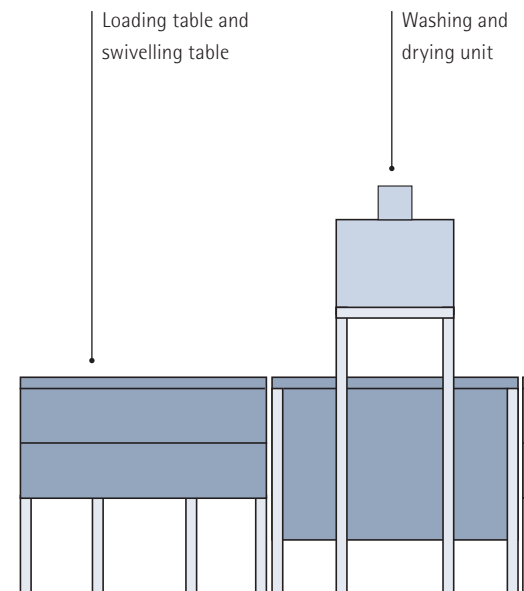
Glass decoration with inorganic ceramic inks

The entire process is automated, from loading onto the swivelling table to the washing, print and dry out procedure up to the transportation onto the swivelling table as a ready to deliver product. Transportation of the glass is controlled via special pneumatic lifting tables, while the positioning system guarantees the exact positioning of the glass sheet before it is sent to the Durst printer.

From computer to print

Beside a higher productivity, the possibility to be updated and a better print quality, the Rho Vetrocer 250 inkjet printer is easy to use and provides an optimal work flow. The Rho Vetrocer 250 is reliable and always ready to produce, either small and one offs or medium or large volumes. The system will enable to print with no down time various formats and volumes without the need to replace templates, as opposed to what happens in screen printing.

The digital original is sent from a computer to the RIP Station and then to the printer therefore avoiding any print proof, both screens and plates. No time lost to retool the printer for each colour, the print process is continuous: transmission, loading of the image and print are performed in parallel.



Washing and drying unit

The washing and drying unit is made of stainless steel and is formed by four tabs with pumps and dryers.

The equipment is totally automatic, it transports the glass through a prewash section with two high pressure nozzles, then through a wash section having two, three or even four couples of cylindrical brushes to then enter the dryer section formed by two couple of nozzles emitting air powered by a high pressure fan. The machine, which is easily maintainable, has a motor driven opening function and special solutions designed for specific needs o highly sensible coatings. It guarantees a washing stage suitable for any glass thickness and it is able to wash out any dust, grease (finger prints), zinc and packaging leftover.



Transport belts

Transport belts have embedded lifting tables and adjustable rollers for the manual rotation of the glass and/or suction cups to keep the glass in position.



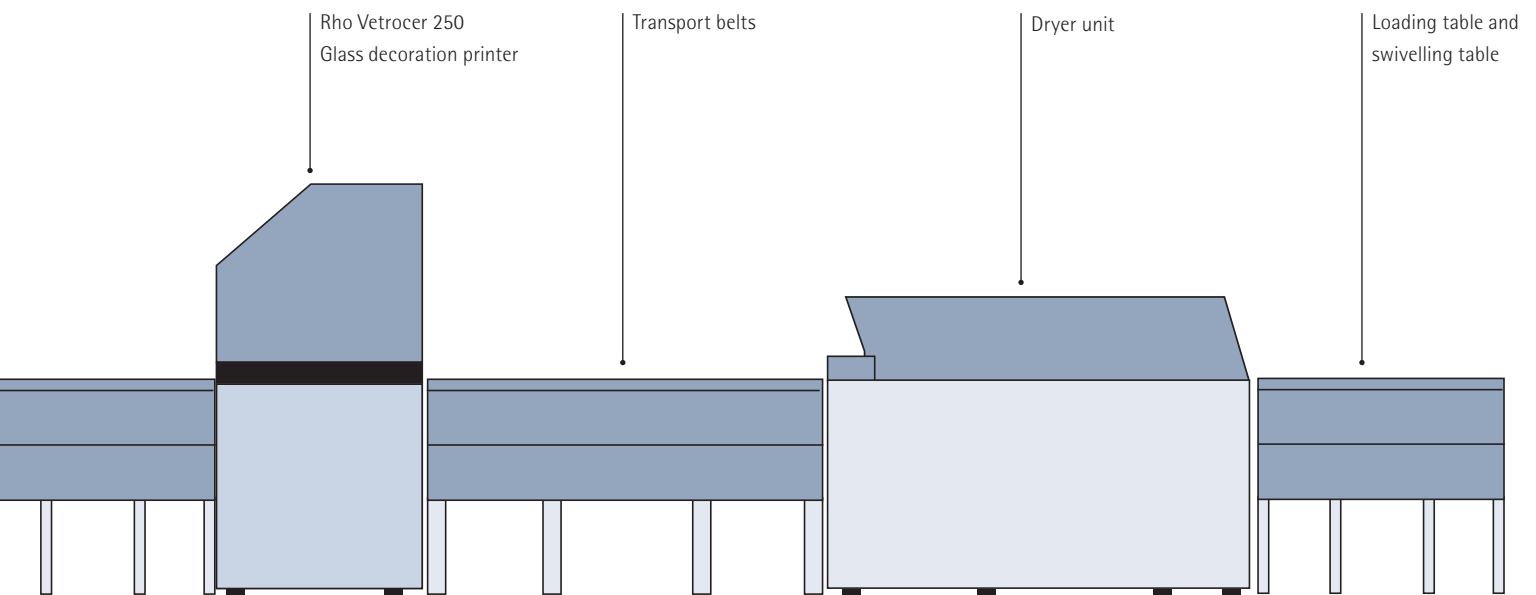
Positioning and centering

The perfect positioning of the glass is obtained through transversal lifting belts and an extremely precise mechanical and electronic system.



Sliding base

The base has transversal lifting belts placed toward various directions (XYZ), combined with transport belts or swivelling tables.



Rho Vetrocer 250

Rho Vetrocer 250 was specifically developed for the glass decoration.

It combines all advantages from the Durst Rho series: continuous print without interruptions, high productivity and optimum print quality for glass plates of any length and having a width up to 2,5 meters. It provides a special transport mechanism which gently guides the glass plates through the print process.

Equipped with the most up-to-date Durst Variodrop- CF printhead technology, the printer offers a resolution of 800 dpi and it guarantees maximum print speed and quality.

Rho Vetrocer 250 offers a reliability without compromises and it is designed for a continuous 24/7 operation.

Dryer unit

The infrared dryer unit heats up the glass to a temperature of 200°C pre-drying the glass ceramic ink.

The air flow and the speed of transport belts can be adjusted to the ongoing process.

An integrated system

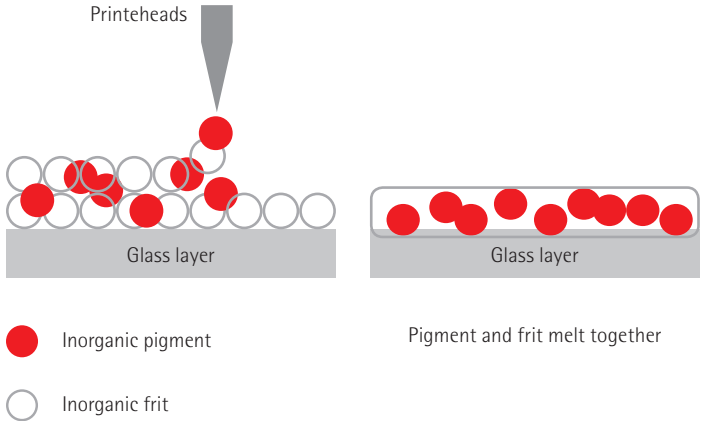
For customers who desire an integrated system, Durst will undertake the duty to perform the entire project, which includes also the adjustment process and the integration of third party solutions.

Performances relate to all aspects: course of the contract, supply, installation, factory acceptance and customer care.

The Durst inorganic ink system for the digital print

The Rho Vetrocer ink, manufactured with inorganic pigments and frits with related fluid vector and dispersing agent, was specifically developed for printing on glass supports. The ink is applied directly onto the glass, without any primer, and it binds to the glass permanently through a baking process inside the oven (external), at a temperature between 680°C and 700°C. The ink becomes thus "part of the glass". Durst inorganic ceramic ink uses selected metallic nontoxic pigments and frits without lead: it is available in black, white, red, blue, green, yellow and satinato. It offers a perfect protection against UV rays and, once the colour is applied at layers >60 gr/m², it also becomes opaque.

Glass-ceramic inks may be used for printing onto flat glass. Through the bake process, ceramic inks are fused together to the glass surface, thus obtaining both glass (ESG) and in further processing safety coupled glass (VSG).



Certificates of consistency – Vetrocer ceramic inks

Staatliche Materialprüfungsanstalt Darmstadt Fachgebiet und Institut für Werkstoffkunde	Fraunhofer Institut für Bauphysik (IBP), Stuttgart	Fraunhofer Institut für Bauphysik (IBP), Stuttgart
Test date: 03rd/04th September 2014	Test date: October 2014	Test date: October 2014
Pummel test result	temperature storage 336 h at 50° C <ul style="list-style-type: none"> scratch hardness test according to DIN EN ISO 1518-1: 2011-01 yellow: 20 N, red: 12 N, green: 18 N blue, white, black >20 N gloss level measurement: (after exposure) DIN 67530 yellow: 76, red: 82, green: 94, blue: 78, white: 46, black: 90 	UV resistance test: spectrophotometric measurement according to DIN EN 410/à 1000 h emissivity according to DIN EN 16012
Classification according to Kuraray requirements: non printed: 8 printed: green, red, blue: 8-9 printed: black, white, yellow: 8	Summary: Based on the results the coatings by storage at a temperature of 50° C almost show no reduction of the investigated characteristics compared to the original status.	Summary: Visually no changes are observed. Measurement using spectral reflectance, transmission measurement and emission meter type TIR 100-2 the coatings only show slight changes. Almost all values after testing show the values of the reference samples.
Summary: The pummeled printed samples and non-printed samples are comparable.		

The opportunity to access the high remunerative glass decoration field

Application fields for the inorganic ceramic ink print systems

The glass decoration performed with the Rho Vetrocer 250 printer and the ceramic inks offers today extremely interesting commercial opportunities which in the past were rarely remunerative or even impossible. Between one colour and another the time needed for the screens production, the machine preparation and dry time are just been zeroed. Beside these economic advantages, the shorter response and supply time will offer customers a real added value.

Now you can quickly and easily print one offs or a small or medium number of units with various colours, making the decoration on glass really innovative. Personalization, variable data and edge-to-edge print offer architects and interior designers new and extraordinary opportunities to integrate the glass decoration into their interior design projects.

Durst inkjet technology offers the following advantages:

- No need to produce screens, so no need for storage
- No need for solvents and water for cleaning
- Digital technology allows printing of variable data (text and numbers)
- Flexibility – each glass support may have a different shape; as digital printing uses no screens, adaption to different sizes and shape is done by the computer in the moment.
- May be embedded in the glass production line
- Maximum flexibility, print of standard or specific formats
- Standardized DXF interface for the connection of software studied for the glass manufacturing
- Continuous production of different formats with no need to modify the original format
- When printing, using the 6 base colours, composite colours can be obtained

Fields of application:

Indoor applications

- Shop furniture
- Bar decorations
- Fairs
- Glass for furniture
- Divider walls
- Videogames
- Shiny coatings, such as for coffee machines, elevators

Outdoor applications

- Buildings facades
- Temporary stores
- Seasonal outdoor signs
- Solar panels



Technical Data

General specification

Dimensions:

Width: 5850 mm

Length without table: 1794 mm

Height: 1960 mm

Weight:

App. 3850 kg (8487 lb)

Electric supply data:

max. 30 KVA/400 V (EU regulation)

max. 30 KVA/190-240 V (USA regulation)

Safety compliance:

Rho Vetrocer is compliant with the existing safety regulations for printers

Print specification

Print system:

Durst patented flatbed system with Variodrop-CF technology of the printheads for the maximum print quality and ready to use in any moment.

Resolution:

800 dpi

Colours:

Standard: RBGYK

Optional: white and glazed (satinato)

Inks:

Durst Vetrocer Inorganic ceramic inks

Productivity:

(depending upon the weight of support to print):

- Vetrocer 250 Basic:
2 pass mode up to 25 m²/h
4 pass mode up to 12 m²/h
- Vetrocer 250 Presto:
2 pass mode up to 55 m²/h
4 pass mode up to 27 m²/h
- Vetrocer 250 HS:
2 pass mode up to 100 m²/h
4 pass mode up to 55 m²/h

Print over large areas with opaque ink print >60 gr/m²:

- Vetrocer 250 Basic: 14 m²/h
- Vetrocer 250 Presto: 28 m²/h
- Vetrocer 250 HS: 55 m²/h

Software/RIP:

Durst Linux Software for the Rho printer;
Caldera external RIP server

(GrandRIP+ software)

Optional: Colour Calibration Software by spectrophotometer

Media specification

Media:

Flat glass, can be baked to produce a safety glass (ESG) and a coupled safety glass (VSG with PVB or EVA).

Max print width:

250 cm (98 in.)

Max print length:

Up to 8 m (26 ft), restricted only by the glass weight and by the supply table.

Max weight on the transport belt:

220 Kg (485 lb)

Material thickness:

3-19 mm (0,11-0,74 in.)

Max height for installation:

2.400 m above sea level

Temperature range:

+18 °C to +25 °C

Relative humidity:

25-80%, non condensing



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