Glass printing champions

# Two physicists and a glass specialist join forces to develop a unique floor for an indoor sports arena.

GlasDruckManufaktur GmbH, Langenselbold, Germany.
Two physicists and a glass specialist have developed a unique automation solution for direct printing on large-format glass surfaces for a substantial order. Now they are back to tackling their originally envisaged core activity: lighting systems for trade, industry, shop fitting and interior design.



It goes like this: a glass expert and two physicists specialised in automation and bespoke mechanical engineering join forces with the idea of developing lighting solutions based around personalised glass and plastic panels. Digital direct printing is their technology of choice. Together, they found the company GlasDruckManufaktur and purchase a Nyala 2 large format printer. Such was their original plan, with process automation as a future option.

## Automation for a large order

But when a prospective customer came knocking with a lucrative large order, the team decided that their planned business idea could take a back seat for a while. Instead, they put everything into supplying elements for a novel type of glass flooring in sports halls: a sprung floor with different sports pitch markings delineated on its underside and able to light up or go dark at the press of a button to match the current game. This also came down to printing on glass and a lighting solution – not so remote from the original business idea after all. Yet considering that the elements were plate glass panels weighing 160 kg (352 lb) each, it was soon evident that personnel would need strong support with material handling. It was time to bring on an industrial robot and automation.

A specially developed tilting table swivels glass panels from vertical to horizontal.

## Complex integration

The Nyala 2 arrived on the premises in August 2016. The customer asked for the initial test elements to be delivered in December. GlasDruckManufaktur lost no time evaluating a Kuka robot that was installed shortly thereafter in September 2016, and a glass washing machine was added to complete the end-to-end process. In addition, Nagl & Vetter GmbH custom-developed a tilting table that would take vertically-oriented glass panels off the washer and turn them through 90 degrees, whereupon the robot could grab the now horizontal panel and lay it down on the printer flatbed. Nagl and Vetter personally took care of integration and communication between the individual items of equipment and machines. “swissQprint’s cooperative willingness was crucial at this phase because we needed interfaces,” Dr Nagl is keen to point out. Summing up, he says: “I doubt whether we could have done it with another printer manufacturer.”

## Cleanroom conditions

A hall kept under cleanroom-like conditions houses the tilting table, the robot and the printer. It is air-conditioned with constantly controlled humidity and the ventilation system is equipped with dust filters. “A single speck of dust ruins the impact of a backlit glass image,” says Uwe Zeiler, the glass specialist in the trio. The washer is situated outside the printing room, which has a slit in the wall for feeding through cleaned glass panels. The control centre is also in an adjoining room: the operators can run and monitor the entire setup from there – yet another step taken to minimise dust issues.

## Business gains traction

With the large order now fulfilled, further flooring projects have been negotiated or are in planning and execution. Meanwhile, GlasDruckManufaktur has launched its glass printing services through other channels, in particular glass wholesalers who order personalised elements for interior decoration and shop fitting. Print bed sized (3.2×2 m/126×79 in) plate glass is not uncommon, or even oversized formats of up to four metres (157.5"). The robot continues to have its grippers full, handling an order from a private customer who wanted a wood-effect glass floor for his squash court, for example.

Dr Nagl integrated the automation himself.

No more confusing jungle of lines in sports halls: printed glass flooring with backlit pitch markings. (Image by ASB)

## Definitely the right choice

GlasDruckManufaktur has learned a lot from its first big project. As Dr Nagl explains in review: “Choosing a Nyala 2 was all about quality and that has been borne out in practice. We didn’t appreciate the significance of its productivity until later.” The Nyala 2 delivers 206 square metres (2217 square feet) per hour in its fastest print mode. The UV printer is equipped with special ink for direct printing on glass, in CMYK and light colours to achieve the most natural-looking colour reproduction possible. In addition, four print heads carry white to speed up the application of top and intermediate layers. Uwe Zeiler adds: “Going for a flatbed has also proved its worth.” From the outset, process reliability and efficiency considerations meant that GlasDruckManufaktur could rule out printing onto film for subsequent application to the glass. “And apart from this, film has dimensional limits. With direct printing, that is not an issue,” says Zeiler.

## Back to the original idea

Meanwhile, the resourceful minds have returned to their original ideas around illustrated ceiling illumination, nearly borderless glass murals with incident or transmissive lighting, and backlit kitchen splashbacks. Developments are under way: “On the printing side, we are experimenting with translucency and colour profiles,” explains Dr Nagl, “and we are doing parallel work on a proprietary frame system.” GlasDruckManufaktur wants to deliver a total solution, to be offered as far as possible through direct sales or via craftsmen. The organisation has already been set up accordingly. “Considering our high efficiency, we are confident our chance of success in this niche is high,” concludes Uwe Zeiler.

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| Company | GlasDruckManufaktur, Langenselbold, Deutschland |
| Website | www.glasdruckmanufaktur.de |
| Segment | Digital glass printing |
| Established | 2016 |
| Employees | 6 |
| Printer | Nyala 2 |
| References | ASB Glass Floor: backlit sports hall flooring<br>Glass wholesale and craftsmen: signboards and pictures (incident and transmitted light) for interior design and shop fitting<br>Private customers: kitchen splashbacks and lighting solutions |