



Laser - Glass processing with a future from small formats to XXL

Following the trend of modern architecture to increasingly larger glass elements glass machines must be able, accordingly, to process units with increasingly larger glass areas. Cerion GmbH from Minden has done its homework in this area and developed the world's largest laser glass finishing machine.

Whether finishing bathroom mirrors, glass doors or large façade elements, Cerion GmbH offers the ideal machine concept for any format and all glass processing companies. When selecting machinery, the size of units that can be processed has become an important purchasing criterion for glass processing and finishing companies. More and more often architects all over the world plan buildings with large glass surfaces, both in the private and public sector. Companies wanting to do business with them must be technically capable of processing also large formats in a large variety of shapes. Meanwhile, dimensions are possible with functional glass that seemed inconceivable only a few years ago. As an example, a composite glass pane with a length of 14 metres and a height of 3.20 metres was presented in January this year at the international trade fair BAU in Munich.

The trend towards large sizes does not stop either with the individual surface finishing of flat glass. Cerion GmbH from Minden has recognised this development early on and expanded its inclined bed laser system c-vertica to a hitherto unique size level. Glass panes with a size of 10 m x 4 m can be custom-finished with the machine. This world's largest laser system has been in operation at Isophon Glas GmbH in Hann. Münden since the autumn of 2012. "The company has opted for the futuristic laser technology because it offers many advantages over conventional finishing methods such as sandblasting, screen printing and etching, provides

significant rationalisation potential and, in addition, opens up entirely new possibilities with the design of glass surfaces", explains Andreas Wienkamp, managing director of Cerion GmbH. Without the time and labour-intensive use of masks, screens or chemicals the high-performance c-vertica enables the very efficient design of decorative glass in various forms and shapes, façade elements, doors and insulating glass according to customer preference – regardless whether mass-produced or individually manufactured – states the Dipl. Physician. Cerion also offers compact and thus more cost-efficient machines for laser finishing of smaller formats such as mirrors or glass doors.

Technology ready for the industry

For more than ten years Cerion has been actively involved in the ongoing development of laser technology and has brought it up to a level ready for the industrial flat glass finishing market. Depending on customer demands, the high-performance system c-vertica can be designed exclusively for the surface processing of glass or as with Isophon, as dual system both for surface finishing and for subsurface engraving.

In surface processing the powerful CO₂ laser with high processing speeds allows generating high resolution designs, graphics and images as well as large-area frosting exact to the millimetre. Depending on the decor, up to three square metres of glass with a resolution of 250 dpi (dots per inch) can be finished per hour with consistently high quality. Different grey scales are possible here by changing the laser intensity. The tests performed by the LaserZentrum Hannover on laser-processed glasses have confirmed that in regard to bending and pulse resistance they meet the requirements of a static glass building component in the construction sector. The c-vertica can also be used to remove glass coating, for example, the back sides of mirrors as well as painted and powder-coated glasses. The possibilities with the production of walk-on glass are quite interesting as well. Here, the patented Lasergrip[®] slip resistance from Cerion, certified according to R9 and R10, offers a nearly transparent and non-abrasive alternative to conventional methods. Another benefit of the innovative finishing technology: Laser finishing does not require any preparatory or follow-up handling of the glass making, automated production runs are possible. The achievable rationalisation potential is thus significant.

A diode pumped solid-state laser is used for the subsurface engraving of flat glass. With this laser type, which can also be used to cut glasses and produce three-dimensional structures on the surface, a pulsed laser beam creates the desired structures inside the glass without touching the glass surfaces. Three-dimensional motifs and structures, e.g. light-deflecting lamella, can be introduced into the glass with great precision.

Fully-automatic operation

Both, surface and subsurface engraving, can be done fully automatically with the c-vertica from Cerion as an option. The desired motifs are first generated on the PC and then positioned exactly on or inside the glass panels, controlled by the system's computer. The fully automatic version of the c-vertical can be equipped with a slot trolley. With this design version the laser system retrieves the glass units automatically and returns them to the slot trolley after processing. Thus, the system can be run very economically around the clock almost without the presence of an operator. The powerful inclined bed machine is designed for glass

thicknesses up to 40 mm. In automatic mode, glass thicknesses of up to 12 mm can be processed. Because the c-vertica from Cerion is manufactured in different sizes, the innovative laser system is not only of interest for the glass industry but also for small and medium-sized enterprises. Entering the field of laser finishing is meanwhile possible from 69,000 Euro plus service contract bringing it within reach also for small businesses.

The following glasses can be processed with the c-vertica: Float glass, Optiwhite®, mirror (front, inside or back), TSG, HSG, VSG, coated glasses, acrylic glass (XT and GS), matted glass, (Satinato, sandblasted glass). The minimum glass thickness is around one millimetre. From a material thickness of four millimetres, the customary stability of TSG is maintained. Subsurface engraving, however, cannot be used with heat treated glass, as there is a risk of breakage during laser processing or over a period of time through spontaneous breakage in pre-stressed glass. Subsurface engraving prior to the pre-stressing process does not solve this problem either.

c-vertica application options

- Enhancing glass surfaces with individual designs
- Glass matting in different grey scales
- New possibilities to strip coatings from glass for decorative and technical applications
- Transparent and permanent anti-slip surfaces with the patented Lasergrip® process
- Structuring (and cutting) of technical glass with a quality unknown up to now
- Engraving of two and three-dimensional designs and structures inside the glass
- Patented subsurface engraved micro-lamella as unobtrusively integrated solar protection or light deflection

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