

LiSEC's Dynamic Load Balancing solutions

LiSEC's successful VSL-A horizontal cutting system for laminated glass processing was introduced to the market at the end of 2018. Since then, many customers have lauded its output qualities, its patented SIR film heater, the significant extent to which it reduces glass waste and the reduced operator intervention accompanying its enhanced automation.



The laminated glass cutting machine can be connected to a downstream sorting system. An additional automatic rotating device ensures entirely automatic cutting of laminated glass.



VSL-A tandem

laminated glass cutting solution
with Dynamic Load Balancing

To better meet individual customer needs, LiSEC's solutions have included development of a modular laminated glass cutting system solution that can be adapted and expanded step-by-step, as required. At the final stage of expansion, two VSL-A stations can be consecutively combined to cut glass down to size on the second VSL-A Tandem. Also, an hourly output approximating up to 140 units of fully-cut sheets can be

achieved jointly with intelligent Dynamic Load Balancing. Here, the past two years has seen extensive development of VSL-A's production control logic and engineering - all in keeping with the coveted dictum of P. Rosenthal: "If you stop getting better, you stop being good."

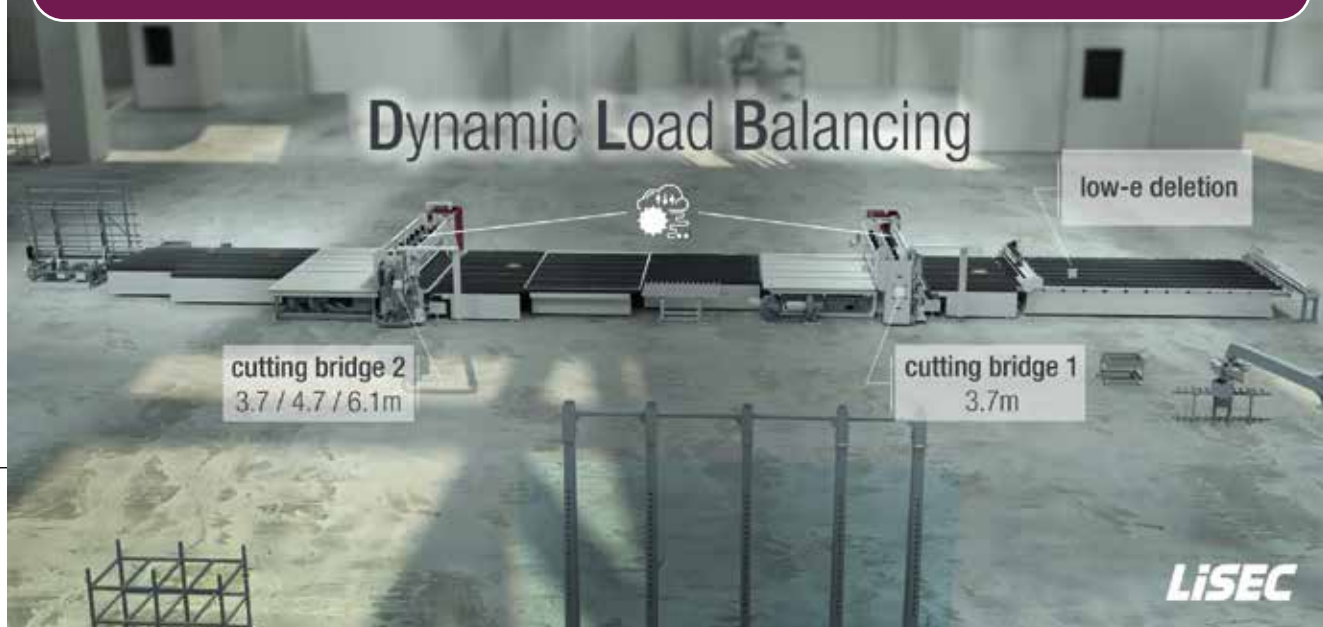
FULLY AUTOMATED GLASS-CUTTING

In the company's glass cutting department, product manager Daniel Schör-

ghuber introduces future laminated glass-cutting solutions that are almost fully-automatic and which exhibit both high output and optimum cut quality. Commenting upon the focus of current developments in LiSEC's VSL-A cutting technology, he says: "We've taken into account the growing portion of laminated glass, especially at companies that process insulating glass. This allows for higher output in less time with reduced

waste. Not only. Over the past two years and following much project planning, we've jointly assessed with our customers their production data while analysing existing situations in the production facilities - all of which has led us to conclude that a glass storehouse will usually supply two to three cutting lines at most. Generally, there's no space for any width-wise expansion that makes no allowance for structural adaptations to the produc-

Laminated glass cutting with dynamic load balancing: The VSL-A system solution for especially fast laminated glass cutting by LiSEC (Type A customer system). Intelligent Dynamic Load Balancing ideally supplies both cutting bridges, which maximizes output with low space requirements.



tion hall. That's why with the necessary increase in automation coupled with a high quality that remains sustained regardless of the raw glass quality, LiSEC's new system solution meets market demand at a time when labour is especially tight. Here, with the laminated glass cutting capacity increased by a modular concept based on VSL-A technology, the VSL-A system solutions mark an important step toward fully automatic systems."

Concerning the structure of the modular design, Schörghuber explains that it all starts with automatic glass storage, operating simultaneously with a system for edge deletion or removal of the LSG film overhang where the first VSL-A is cut with conveyor belts. "Then," says Schörghuber, "depending upon production quantity and variety, users can choose between two different variants. Customer Type A, who has much product mix variation in (X-Y-Z cuts) can already reach an hourly output of approximately 75 sheets with an additional VSL-A station without Tandem, downstream from the first VSL-A station in line - and all that is completely automatic. Here optimal dynamic use of the two VSL-A system solutions plays a major role. Moreover, new operating modes have been developed, such that sport mode can be switched to comfort

mode at any time. With comfort mode, the system will continuously produce fully-cut glass sheets on the conveyor belt with almost no human intervention, while sport mode will provide additional production capacity. Here the operator assists the station, especially in separating scraps, which again makes for higher output - a special advantage during production peaks. Customer Type B, who often produces identical products (X-Y cuts), can expect an hourly count of approximately 140 sheets with a VSL-A station in Tandem design. In Tandem mode, two sheets can be simultaneously cut on the second VSL-A - automatically."

DYNAMIC LOAD BALANCING (DLB)

As to how the dynamic load planning works, Schörghuber describes two consecutive VSL-A laminated glass cutting bridges during development, for which he underscores the importance of loading them intelligently and as well as possible in order to both maximize output and reduce waste. Schörghuber says: "We achieved this through mutual dynamic production control, which - depending upon the specific optimization - dynamically distributes the processes on three individual laminated glass cutting bridges. This Dynamic Load Balancing (DLB) loads the

STANDARD FUNCTIONS

- Approximately 45 units of trimmed sheets per hour with one VSL-A cutting bridge (X-Y-Z cuts) - fully automatic;
- Approximately 75 units of trimmed sheets per hour with two consecutive VSL-A cutting bridges (X-Y-Z cuts) - fully automatic;
- Approximately 140 units of trimmed sheets per hour with two consecutive VSL-A cutting bridges (X-Y cuts), plus tandem function on second station - fully automatic;
- Version with Dynamic Load Balancing (DLB) of two cutting bridges for maximum output and minimum waste;
- Version with one, or a maximum of two, laminated glass cutting bridges with 3.7 metres, 4.7 metres or 6.1 metres - special space-saving design;
- Cutting of laminated glass from 22.1 (4.38 millimetres) to 1212.12 (28.56 millimetres) glass thickness, at cutting speed precision of circa 0.4 millimetres and up to 140 metres/minute;
- Approximately 10 per cent higher edge-strength through reduced heat transfer into the glass - thanks to a patented SIR heater, cutting wheel design and pressure regulation;
- Up to at least 20 millimetres fully-automatic cutting, breaking and separating of laminated glass;
- Automatic sub-plate rotation to the maximum dimensions and maximum glass thickness;
- Electronic cutting pressure control and cutting wheel consumption analysis;
- Very low maintenance and high system availability;
- Simple operation thanks to a graphic touchscreen interface.



The VSL-A system solution provides consistent cut edge quality with fluctuating quality of laminated glass mostly without operator intervention, ensures ± 0.4 mm tolerance, and verifiably reduces false breaks.

bridges very well, reducing throughput time for each optimization while increasing the hourly output of completed units.”

Schörghuber speaks of the advantages offered by two consecutively arranged VSL-A laminated glass cutting bridges, describing ‘the high mechanical stability of the VSL-A cutting bridges, which form the basis for consistent, precise cutting results.’ He continues: “The first VSL-A station optionally has the front edge cutting to at least 20 millimetres before automatically disposing of it within a container. The X sub-plate cut follows, which is precisely rotated to 90 degrees without operator intervention by the VSL-A’s integrated rotation function. Then, at the trailing edge of the sub-plate, the Y scrap is automatically removed

OPTIONAL FUNCTIONS

- Cutting of custom shapes and W sub-plates;
- Automatic processing of float glass and two-sided film coated float glass possible - cutting, film separation and breaking;
- Rotating device for finished cut glass sheets for automatic connection to a sorting system;
- Version with automatic laminated glass scrap disposal (GSA-A) — laminated glass scraps are crushed quietly, and dust-free, before being disposed of in handy containers;
- Expansion option from one cutting bridge (VSL-A) to a system solution with two VSL-As and a tandem option.

and disposed of. The sub-plates prepared on the first VSL-A station are now further processed at the VSL-A bridge. Depending on the dynamic load plan, the first station can also make Y cuts. The next

step sees both the Y and Z cuts done, with the scraps removed without operator intervention. Automatic outfeed then follows, together with removal of the finished products either by an operator or by auto-

matic transfer to a downstream sorting system.”

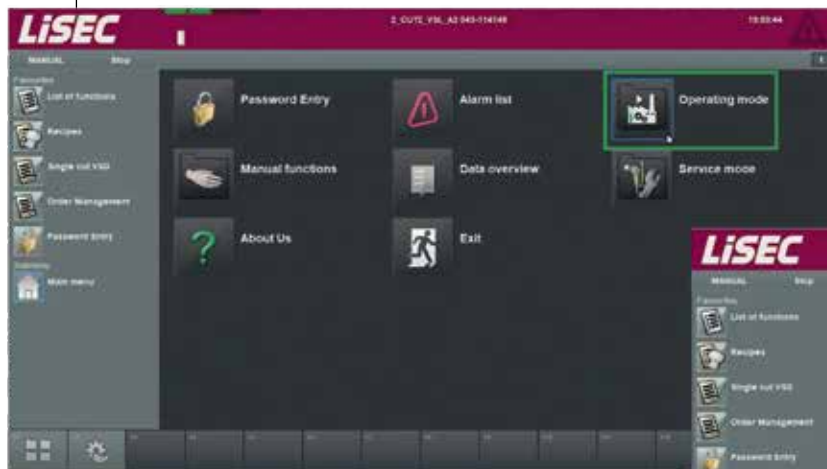
PERFORMANCE FEATURES

Laminated glass cutting with dynamic load balancing: The VSL-A system solution for especially fast laminated glass cutting by LiSEC (Type A customer system). Intelligent Dynamic Load Balancing ideally supplies both cutting bridges, which maximizes output with low space requirements.

The laminated glass cutting machine can be connected to a downstream sorting system. An additional automatic rotating device ensures entirely automatic cutting of laminated glass.



The patented SIR (selective infrared) heating modules are 900 mm long and reduce heating time to about 4 seconds at 44.2 (8.76 mm) of laminated glass and thereby the heat load to the glass, which improves edge strength by at least approx. 10%.



Always have an overview, thanks to intuitive operation and display. Various operating modes, such as comfort mode and sport mode, ensure maximum flexibility and performance, based on current requirements.



Consistently high edge quality and strength with VSL-A technology from LiSEC. Elimination of grind additions and significant reduction of spontaneous breakage, thanks to especially high edge quality of cut laminated glass on the VSL-A from LiSEC.

The patented SIR (selective infrared) heating modules are 900 millimetres long and reduce heating time to about 4 seconds at 44.2 (8.76 millimetres) of laminated glass, thus reducing heat load to the glass as well, which also improves edge strength by at least approximately 10%.

The VSL-A system solution provides consistent cut edge quality with fluctuating quality of laminated glass, mostly without operator intervention, so

ensuring ± 0.4 millimetre tolerance, while verifiably reducing false breaks.

An overview is rendered always possible thanks to intuitive operation and display. Various operating modes, such as comfort mode and sport mode, ensure maximum flexibility and performance, based upon current requirements.

HIGHLIGHTS

Fast, flexible LSG cutting

Use of a VSL-A system solution with two cutting bridges extended with dynamic load balancing (DLB) affords the VSL-A Tandem the ability to provide continuous high output and process safety under any conditions. Depending upon the version (with or without the Tandem option) and optimization (cutting plan), this

allows up to approximately 140 completed sheets per hour.

Fully automatic production

Laminated glass is cut, broken and separated entirely automatically. Rotation and further feed requires no operator intervention. Laminated glass, fully cut, is consistently delivered 'just in time' as a result of independent, operator-free cutting of reduced environmental impact.

Consistently high-quality cutting results

A specially-developed SIR film heater for current and future laminated glass cutting requirements, which reduces heat stress to the cut edges while ensuring an edge strength that is (at least) approximately 10% greater.

Double precision-guided cutting heads with direct drive and dynamic cutting pressure control which includes cutting wheel consumption monitoring and will reduce oblique breaks and sliver formation - all of which forms the basis for successful, scratch-free LSG cutting while significantly reducing added grind.

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