Machinery for Flat Glass Processing
Reliable processes, good quality, solid profit: LiSEC solutions provide flat glass processors around the world with security and drive in a challenging environment.

For the last 50 years, we have been working hard to enable you to sustainably boost the efficiency, the system availability and the quality output of your flat glass production process. Thanks to forward-looking thinking, continuously striving to find the best solution and a great deal of personal commitment from our employees, we have grown from a one-man company to a technology leader.

Our advanced solutions generate a great cost-to-benefit ratio throughout the entire lifecycle of your machines and systems.

Customers around the world can benefit from this: be they experienced manufacturers or newcomers to the industry, from family businesses to industrial glass processors. Three main factors are essential for long-term success:

1. Turn Key Solutions
   Everything from a single source including software. Customers benefit from the only company in the flat glass machine industry that can comprehensively plan and develop large projects - also thanks to the widest product range in the industry.

2. Excellent Service
   Investment security and the highest availability and productivity enable the large, global LiSEC service network. A contact person familiar with the local language and customs is available close to you.

3. Performance through software integration
   Integration of the production management software and the machinery control (digitalization/Industry 4.0) allows top operation and optimization of all integrated machines or whole glass factories.

The benefits:
- Over 50 years of partnership, pioneering spirit and stability
- Investment security due to the size of our company
- Leading technology with a high resale value
- Great cost-to-benefit ratio throughout the entire system lifecycle

Facts and figures:
- 1961 founding year
- 1 strong brand
- 1,300 employees
- 25 sites
- 230 million Euros turnover (2017)
- 95 % export rate
- 7 % of turnover for R&D
- more than 330 patents
# Machinery for Flat Glass Processing

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<td>Vertical Edge Processing Center with Integrated Single-Sided Drilling and Milling Function</td>
<td><strong>topCLEAR Special</strong>&lt;br&gt;Washing machine for professional cleaning of glass up to 12 mm thickness</td>
</tr>
<tr>
<td><strong>Washing</strong>&lt;br&gt;P. 40</td>
<td><strong>topCLEAR Super</strong>&lt;br&gt;Professional series for thick-glass processing up to 20 mm</td>
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<tr>
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<td><strong>VHW-E</strong>&lt;br&gt;Automatic washing and drying plant for flat glass</td>
</tr>
<tr>
<td>Precision scanner for processed flat glass</td>
<td></td>
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Machinery for Flat Glass Processing

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- Services
  We offer you worldwide service and the fastest possible supply of spare parts.
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Competence Center

- LISEC Glass Forum
  Competence Center for research, production and training in the field of flat glass processing
  p. 66
We match the LiSEC lines individually to suit your production requirements. You can combine innovative systems from the areas of glass processing, glass cutting, tempering and logistics to form a complete line system. Our employees are always pleased to advise you, and to work with you to configure line solutions designed to suit your precise needs. In order to use the full efficiency of your production, cross-line software solutions are available.
SplitFin
The new vertical processing concept: Modular and fully integrated at the same time

SplitFin aims to optimise your entire production operation, using the specific advantages and highlights of the various standalone machines. In contrast to all-in-one centres, and to stand-alone solutions, you can use this LiSEC processing line for high output levels on the entire line at once, and if requested, simply operate and use the standalone machines. Of course, you could simply start with one machine, then extend your line at a later date to include other systems.

LiSEC SplitFin components:
The core components of the SplitFin line are the following standalone machines:
- EPS vertical fully automatic edge grinding machine, optionally with one or two grinding heads and, upon request, with automatic tool changing.
- Integrated component but located in a second machining turret: the MRX-B drilling and milling centre with integrated tool-changer and patented LiSEC water jetting technology.
- These processing devices are complemented by a TCL or a VHW glass washing machine. On request, they can be retrofitted with a selection of vertical semi-automatic or fully-automatic shuttle and sorting systems.
- And don’t forget the integration, consistency, and compatibility of the software. Naturally, the system may be integrated with external ERP systems or supplied with drawing data. You can expect current visualisation and evaluation systems with all of the modern operating systems.

### Technical Data

<table>
<thead>
<tr>
<th>Technical Aspect</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness</td>
<td>4 - 20 mm</td>
</tr>
<tr>
<td>Maximum glass height</td>
<td>1,600 mm / 2,000 mm / 2,700 mm</td>
</tr>
<tr>
<td>Maximum glass length</td>
<td>2,500 mm / 3,300 mm / 4,000 mm</td>
</tr>
<tr>
<td>Minimum size</td>
<td>600 x 160 mm</td>
</tr>
<tr>
<td>VLO (second vertical transport lane)</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Water jet</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Washing machine</td>
<td>TCL / VHW</td>
</tr>
</tbody>
</table>
LiSEC supports you with tailor-made solutions to achieve a high output and reduce the number of operating personnel. The performance of the individual machines has just as much impact as the possibility to combine those processing machines with semi or fully automatic shuttle and sorting systems. Customized logistics solutions reduce the effort for glass manipulation and manual sorting, and consequently the number of necessary operating personnel. It is of course possible to implement these solutions gradually, depending on the customer’s requirements.

**SplitFin**
*SplitFin in combination with individual logistics solutions*

**Highlights**
- Individually configurable and usable according to customer requirements
- Individual machines and transport sections can be extended or added at any time
- Fast cycle times through splitting the necessary processing steps
- Easy production planning and continuous material flow on the line
STAND-ALONE MACHINES

With LiSEC standalone machines, you can achieve seamless production. We not only support you in the insulation glass production business with our LiSEC insulation glass machines. We can also equip you with machines for glass cutting or glass processing as well as with logistics systems and tempering furnaces.
Overview of the processing options

The processing of edges is an important issue for every glass manufacturer. The many and varied requirements on edge quality and the manufacture of internal, edge and border cutaways necessitate the use of a diverse range of processes and production machines.

<table>
<thead>
<tr>
<th>LiSEC Maschinen</th>
<th>Schraut topDRILL Maschinen</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSR/KSV</td>
<td>KBU</td>
</tr>
</tbody>
</table>

**Edge processing**

- **Sanded edge (KGS)**
- **Rough edge (KMG)**
- **Bevelled edge (KGN)**
- **Polished edge (KPO)**

**Internal processing**

- **Bores**
- **Deep-countersinking**
- **Milling**
- **Grinding**
- **Polishing**
- **Water jet**

**Machine construction**

- **Special shapes**
- **Fully automatic**
- **Automatic tool changing**
- **2nd Spindle**
- **Water cushion**
- **Water cushion interfaces suitable**

- Standard, ○ Optional, - Not Available
KSR & KSV
Compact Vertical Glass Edge Seaming Machine for Rectangles and Shapes

Vertical compact grinding machine for the seaming of glass sheets on all four sides in a fully automatic cycle. The glass edges are ground by wet-diamond belts which simultaneously process the front and rear side of a glass edge. The grinding head moves on a vertical guide unit and can also rotate 360 degrees, allowing it to reach all four sides of a glass sheet. This grinding process achieves a perfect and gentle seaming of glass edges with the shortest cycle times and minimizes the quantity of required abrasive tools.

The grinding belts automatically adjust to the respective sheet size and thickness. The grinding width is adjustable from 0.5 mm to 2 mm. The compact dimension of the machine results from only one grinding head processing all sides of a rectangular or shaped glass sheet. Optional equipment for flat grinding (roughening) the glass edges as well as for grinding (shaping) the corners of the glass sheet are available.

Combining the KSR with the compact grinding machine KSV to seam the horizontal bottom edge of the glass sheet can reduce the cycle time by up to 35%. The combined KSR & KSV is perfectly suited for applications in the insulating glass industry.

### Technical Data

<table>
<thead>
<tr>
<th></th>
<th>KSR-21</th>
<th>KSR-25</th>
<th>KSR-27</th>
<th>KSR-30</th>
<th>KSR-33</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Glass height</strong></td>
<td>2.1 m</td>
<td>2.5 m</td>
<td>2.7 m</td>
<td>3 m</td>
<td>3.3 m</td>
</tr>
<tr>
<td><strong>Glass thickness</strong></td>
<td>2.3 - 19 mm (pass-through transport up to 30 mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimal size</strong></td>
<td>350 x 180 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximal size</strong></td>
<td>up to 6,000 mm, longer versions available upon request</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport height</strong></td>
<td>520 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Seaming speed max.</strong></td>
<td>30 m/min at 2.3 - 9.2 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speed flat arrising max.</strong></td>
<td>30 m/min at 2.3 - 3.7 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speed flat arrising max.</strong></td>
<td>20 m/min at 3.7 - 5.6 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Load</strong></td>
<td>150 kg/lm, 250 kg/lm at pass-through transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Highlights

- Compact dimension - only one grinding head
- Perfect seaming in extremely short cycle times
- 35% shorter cycle times with combined KSR and KSV
- Complete machine body made of stainless steel
- Can easily be connected to vertical washing machines and production lines
- Best choice for high quality tempered glass

### Options

- Shapes according to LiSEC shape catalogue
- Corner seaming and front-sided flat arrising of rectangles and shapes
- Combination of KSR with KSV

### Power Consumption

<table>
<thead>
<tr>
<th>Model</th>
<th>L (mm)</th>
<th>B (mm)</th>
<th>H (mm)</th>
<th>Power consumption (kW)</th>
<th>Operating air pressure (bar)</th>
<th>Air consumption (l/min)</th>
<th>Operating water pressure (bar)</th>
<th>Water consumption (l/min) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSR-21</td>
<td>7,350</td>
<td>4,640</td>
<td>3,810</td>
<td>19.3</td>
<td>6</td>
<td>600</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>KSR-25</td>
<td>7,350</td>
<td>4,640</td>
<td>4,206</td>
<td>19.3</td>
<td>6</td>
<td>600</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>KSR-27</td>
<td>7,350</td>
<td>4,640</td>
<td>4,405</td>
<td>19.3</td>
<td>6</td>
<td>600</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>KSR-30</td>
<td>7,350</td>
<td>4,640</td>
<td>4,701</td>
<td>19.3</td>
<td>6</td>
<td>600</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>KSR-33</td>
<td>7,350</td>
<td>4,640</td>
<td>5,005</td>
<td>19.3</td>
<td>6</td>
<td>600</td>
<td>3</td>
<td>0.6</td>
</tr>
</tbody>
</table>

* Water consumption if used with a water treatment system
EPS
Vertical fully automatic grinding and polishing machine with fast double heads

We developed the LiSEC EPS specifically for the flexible and rapid manufacture of ground and polished edges. This processing machine delivers convincingly fast cycle times. These are achieved by consistent optimisation of operating sequences. To satisfy particularly fast cycle time requirements, there is the option of installing a second grinding spindle. Through the use of circumferential discs, a great variety of shapes - including rectangles - can be processed as standard. It is possible to manufacture a polished edge without any tool changes, since all the tools required are located on a single tool holder. Integrating an automatic tool changer is an easy way to achieve flexible production operations.

EPS is easy to link up to internal processing machines, or to washing machines. This well thought-out design makes the system readily accessible for maintenance and servicing work. Tool management is state-of-the-art and includes re-profiling and alignment checks of the machine as well as automatic correction of polishing wheel wear. We place particular emphasis on this machine being easy and modern to operate.

### Technical Data

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum glass length</td>
<td>2,500 mm</td>
<td>2,500 mm</td>
<td>3,100 mm</td>
<td>3,100 mm</td>
<td>4,000 mm</td>
<td>4,000 mm</td>
</tr>
<tr>
<td>Maximum glass height</td>
<td>1,600 mm</td>
<td>2,000 mm</td>
<td>2,000 mm</td>
<td>2,700 mm</td>
<td>2,000 mm</td>
<td>2,700 mm</td>
</tr>
<tr>
<td>Minimum glass dimensions</td>
<td>500 x 150 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass thickness</td>
<td>3 – 20 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of grinding spindles</td>
<td>One spindle, with option of a second spindle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Optional tool changer</td>
<td>12-slot, linear</td>
<td>15-slot, linear</td>
<td>15-slot, linear</td>
<td>20-slot, linear</td>
<td>15-slot, linear</td>
<td>20-slot, linear</td>
</tr>
<tr>
<td>Transport height</td>
<td>720 mm / optional 520 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilt angle for glass transport</td>
<td>6°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tools</td>
<td>Diameter: 100 mm / holder: HSK-50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Highlights
- Short cycle times
- Special shapes and radii are possible as standard
- Simple interlinking
- Optimised maintenance and servicing

### Options & Software
- Second grinding spindle for shorter cycle times
- Automatic tool changer
- Special and slot processing

### Technical Data

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>EPS-A25/16</td>
<td>7,000</td>
<td>4,000</td>
<td>4,500</td>
<td>3,800</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>EPS-A25/20</td>
<td>7,000</td>
<td>4,000</td>
<td>4,500</td>
<td>4,200</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>EPS-A33/20</td>
<td>8,400</td>
<td>4,000</td>
<td>4,500</td>
<td>4,200</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>EPS-A33/27</td>
<td>8,600</td>
<td>4,000</td>
<td>4,500</td>
<td>4,900</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>EPS-A40/20</td>
<td>10,000</td>
<td>4,000</td>
<td>4,500</td>
<td>4,200</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>EPS-A40/27</td>
<td>10,000</td>
<td>4,000</td>
<td>4,500</td>
<td>4,900</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>
KBU

Vertical Edge Processing Center for the Outer Edges of Glass Sheets

LiSEC’s fully automatic edge processing center KBU has been developed to convert CNC grinding of glass into one continuous process, making the arduous production process previously applied for many CNC products a thing of the past. The KBU achieves an outstanding grinding and polishing quality which is virtually independent of the glass size, type or thickness processed. Whether it is used in the construction field or interior design, for functional glass or solar glass, the vertical edge processing center is a highly versatile system which meets all modern demands.

Superior quality

The KBU is equipped with a patented spindle guide, guaranteeing a consistent polishing quality and perfectly parallel seams, even on glass sheets with a length exceeding 10 meters. Furthermore, thanks to the new technology used, the KBU is perfectly suited for processing coated glass sheets, since the face of the glass is never touched throughout the entire grinding process.

Over 50 percent increase in processing speed

The system’s vertical design and the automatic tool changer render tool set-up and positioning times nearly irrelevant. In addition, the vertical construction involves significant advantages in glass handling. Thanks to the continuous process, the KBU can achieve shortest cycle times.

Technical Data

<table>
<thead>
<tr>
<th>KBU-35/27</th>
<th>KBU-50/27</th>
<th>KBU-60/33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass height</td>
<td>2.7 m</td>
<td>2.7 m</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>2-23 mm</td>
<td>2-23 mm</td>
</tr>
<tr>
<td>Minimum size</td>
<td>570 x 180 mm</td>
<td>570 x 180 mm</td>
</tr>
<tr>
<td>Maximum size</td>
<td>3,500 x 2,700 mm</td>
<td>5,000 x 2,700 mm</td>
</tr>
<tr>
<td>Transport height</td>
<td>520 mm</td>
<td>520 mm</td>
</tr>
<tr>
<td>Inclination for glass transport</td>
<td>6°</td>
<td>6°</td>
</tr>
<tr>
<td>Automatic tool changer</td>
<td>20-fold</td>
<td>20-fold</td>
</tr>
<tr>
<td>Tool diameter</td>
<td>150 mm</td>
<td>150 mm</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>0 - 14,000 U/min</td>
<td>0 - 14,000 U/min</td>
</tr>
<tr>
<td>Maximum load</td>
<td>200 kg/m</td>
<td>200 kg/m</td>
</tr>
</tbody>
</table>

Highlights

- Spindle guide system with water cushion
- Flawless processing of coated glass
- Superior polish quality among vertical processing machines
- Flexible product change
- Shape processing supported
- Completely automated

Options & Software

- Special and slot processing
KBF
Vertical Edge Processing Center with Integrated Single-Sided Drilling and Milling Function

LiSEC’s fully automatic KBF edge processing center has been designed to convert CNC processing of flat glass into a continuous process. This puts an end to a tiresome production process for many CNC products. Almost regardless of the glass size, type and thickness, the system ensures outstanding grinding and polishing quality. Furthermore, the integrated drilling and milling function enables processing of milled cut-outs and drilled and countersunk holes in just a single working cycle. A highly precise CNC unit achieves precision tolerances and a maximum level of quality, and the 40-fold tool changer enables very short set-up times. Whether used in the structural glazing or interior design fields, for functional or solar glass, the vertical edge processing center is extremely versatile and meets the highest quality standards.

Versatile system

The edge processing center is capable of grinding and polishing nearly all glass types and shapes with a thickness from 2 to 23 mm. The processing of large-sized and very heavy glass sheets in one cycle is a standard function of the KBF. It can process glass edges of premium quality and is also suitable for FA- and PE-grinding. Graphical menu navigation via the touch screen guarantees intuitive and speedy operation.

### Technical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>L (mm)</th>
<th>B1 (mm)</th>
<th>B2 (mm)</th>
<th>H (mm)</th>
<th>Power consumption (kW)</th>
<th>Operating air pressure (bar)</th>
<th>Air consumption (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KBF-35/27</td>
<td>12,510</td>
<td>4,760</td>
<td>3,160</td>
<td>4,695</td>
<td>43</td>
<td>6</td>
<td>800</td>
</tr>
<tr>
<td>KBF-50/27</td>
<td>14,910</td>
<td>4,760</td>
<td>3,160</td>
<td>4,695</td>
<td>43</td>
<td>8</td>
<td>800</td>
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<tr>
<td>KBF-60/33</td>
<td>16,911</td>
<td>4,760</td>
<td>3,160</td>
<td>5,390</td>
<td>43</td>
<td>8</td>
<td>800</td>
</tr>
</tbody>
</table>

### Highlights

- Spindle guide system with water cushion
- Inner and outer processing in one go guarantees highest precision
- Milling and drilling of shapes
- Production of large cut-outs using break-out laces

Options & Software

- Special and slot processing
- Drillings from 2 mm glass thickness
**MRX-B**

**Vertical CNC milling and drilling centre with water jet technology**

The MRX fully automatic milling and drilling machine delivers convincingly good performance and is easy to operate. Bore and counterbore holes are as efficient to manufacture as complex corners, edges and internal cutaways.

The MRX-B series convinces with its optional water jet cutter, which makes the manufacture of cutaways a great deal easier. The vacuum belt system for securing glass facilitates flexible and continuous production. The drilling and milling centre operates in a fully automatic manner and assists data links to external systems. Graphic input of the processing program and automatic selection of all parameters in the drilling and milling processes make operation simple and error-free.

**Machine configurations for every requirement**

The MRX-B can be configured to suit individual customer requirements. The Linear-8 tool changers make operation as easy as it possibly can be, while the Roto-10 changer increases the process speed. The highest level of process speed is achieved with a combination of the Roto-10 magazine and the water jet cutting head. Modular expansion of the machine length, the choice of two machine heights and a free choice of running direction provide great scope for individual customer configurations.

---

**Technical Data**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRX-B20</th>
<th>MRX-B27</th>
<th>MRX-B20WJ</th>
<th>MRX-B27WJ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Glass height</strong></td>
<td>2,000 mm</td>
<td>2,000 mm</td>
<td>2,000 mm</td>
<td>2,700 mm</td>
</tr>
<tr>
<td><strong>Max. processing height of tools</strong></td>
<td>2,000 mm</td>
<td>2,450 mm</td>
<td>2,000 mm</td>
<td>2,430 mm</td>
</tr>
<tr>
<td><strong>Integrated water jet</strong></td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Max. processing height of water jet</strong></td>
<td>-</td>
<td>-</td>
<td>1,600 mm</td>
<td>2,000 mm</td>
</tr>
<tr>
<td><strong>Tool magazine</strong></td>
<td>Linear-8 or Roto-10</td>
<td>Linear-8 or Roto-10</td>
<td>Roto-10</td>
<td>Roto-10</td>
</tr>
<tr>
<td><strong>Minimum size</strong></td>
<td>600 x 160 mm (drilling / cutting), 650 x 160 mm (milling / grinding)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Glass thickness</strong></td>
<td>4 - 20 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum glass length</strong></td>
<td>Depending on transport line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport height</strong></td>
<td>720 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Angle of inclination</strong></td>
<td>6°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum load</strong></td>
<td>100 kg /min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spindle power (rating)</strong></td>
<td>2 x 5.5 kW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spindle speed</strong></td>
<td>0 – 12,000 rpm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Highlights**

- Milling, drilling and cutting in a single operation
- Integrated water jet
- Extremely fast cycle times
- Two types of tool changers available
- Flexible change of products
- Simple operation without CAD knowledge

---

**Options**

- Linear-8 or Roto-10 magazine
- VLO operation (VLO = vertical lift over)
- Drawing program
- Milling centre with integrated water jet

---

**Vertical CNC milling and drilling centre with water jet technology**

**Technical Data**

<table>
<thead>
<tr>
<th>Machine</th>
<th>L (mm)</th>
<th>B (mm)</th>
<th>H (mm)</th>
<th>Power consumption (kW)</th>
<th>Operating air pressure (bar)</th>
<th>Operating water pressure (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRX-B20</td>
<td>6,200</td>
<td>2,980</td>
<td>3,600</td>
<td>32</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>MRX-B27</td>
<td>6,200</td>
<td>2,980</td>
<td>4,050</td>
<td>32</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>MRX-B20WJ</td>
<td>6,200</td>
<td>3,930</td>
<td>3,600</td>
<td>70</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>MRX-B27WJ</td>
<td>6,200</td>
<td>3,930</td>
<td>4,050</td>
<td>70</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

* Water consumption if used with a water treatment system
MRX-B

Cycle times and scope of processing

The MRX-B is the ideal solution for all drilling, counter-sinking, milling and cutting processes. All machine configurations facilitate flexible, fast and high-quality processing. The use of a water jet together with the Roto-10 magazine at both processing spindles optimises cycle times when different tools on a single glass sheet are used.

Shower Door
- Dimensions: 800 x 1,800 mm
- 2 Mickey Mouse edge cutouts
- 1 handle drilling
Cycle time for the entire processing:
- Water jet < 90 seconds KGNW
- Grinding < 150 seconds KGN

Swing Door
- Dimensions: 1,000 x 2,000 mm
- 2 pieces PT fittings
- 2 handle drilling
Cycle time for the entire processing:
- 90 seconds KGNW

Single-action Door
- Dimensions: 800 x 2,000 mm
- 6 drillings, all countersink drilling
Cycle time for the entire processing: 360 seconds

State-of-the-art machine technology

The new MRX-B meets all the requirements of modern machine technology to ensure a long machine life and highest precision. Due to the small distance between the drilling tool and the water jet nozzle, surface cutouts no longer require „puncturing“. The smallest available drill pierces the glass and the water jet cutter continues directly from the drill hole. The water jet - and the abrasive sand - is always caught by the jet destroyer. This significantly reduces the pollution within the machine. In addition, all relevant movements are of course servo drive controlled. Solid ball screws for the lifting and drilling axes allow very high precision and the fully automatic central lubrication of all essential machine components ensure the uninterrupted operation of the machine. A network connection and remote maintenance possibility via remote access is of course included in the standard at LiSEC.

Fast and flexible processing
- Ideal combination of water jet and diamond tools
- Roto-10 tool magazine mounted directly on the spindle for predictive tool changing
- Drilling, (deep) countersinking, milling and grinding finished in one single cycle
- Batch size 1 facilitates problem-free processing of right angles and shapes

Fast glass handling
- Dynamic vacuum system, without tooling time and also for special shapes
- Different glass sizes, shapes and thicknesses without changes
- Loading of next sheet during the processing operation
- Problem-free combination with upstream or downstream modules (e.g. washing machine)

Fast and simple operation
- Graphical input of all processing operations and automatic selection of all machining parameters
- Autonomous setting of all auxiliary holes and puncture operations
- Program generation at the machine via network or USB
topDRILL RX
Vertical double-sided Drilling Center with Automatic Tool Turret

The topDRILL RX is the first choice for fully automatic drilling and sinking processes. The ingenious tool changer of the smart-5 series can be used very quickly, set up fast, and is absolutely easy to use. The speed-10 tool turret doubles the maximum number of available tools. Countersink holes can be carried out at the front and back without restrictions, regardless of the drilling diameter. The first tool change is already carried out during the drilling process on the opposite side. The high-performance drilling spindles are water-cooled, extremely robust and durable. Maintenance costs are reduced to a minimum.

Flexible configuration, solid quality
The topDRILL RX can be configured depending on the customer’s requirements. In addition to the two types of tool changer, the modular extension of the machine length, the choice between two machine heights as well as the freely definable direction of movement give a range of customizing options. All drilling and countersinking operations are precisely produced in one clamping process. The torque control prevents glass breakage during countersink drilling. Standard includes processing of both float and laminated safety glass sheets.

Technical Data

<table>
<thead>
<tr>
<th>topDRILL RX 130</th>
<th>topDRILL RX 240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass height</td>
<td>Open at the top</td>
</tr>
<tr>
<td>Max. processing height</td>
<td>2,600 mm</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>1.300 mm</td>
</tr>
<tr>
<td>3 - 30 mm</td>
<td>2.400 mm</td>
</tr>
<tr>
<td>Minimum size</td>
<td>600 x 160 mm</td>
</tr>
<tr>
<td>Maximum size</td>
<td>ca. 3,200 mm, can be increased up to 8,000 mm with extension modules</td>
</tr>
<tr>
<td>Transport height</td>
<td>400 mm</td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7° (+/− 1°)</td>
</tr>
<tr>
<td>Max. bore diameter</td>
<td>80 mm</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>0 – 5,000 rpm</td>
</tr>
<tr>
<td>Spindle power (rating)</td>
<td>2 x 5.5 kW</td>
</tr>
<tr>
<td>Number of tools</td>
<td>5 + 5 in case of smart 5 / 10 + 10 bei speed 10</td>
</tr>
<tr>
<td>Maximum load</td>
<td>150 kg/lm</td>
</tr>
</tbody>
</table>

Highlights
- Compact, modular design
- Automatic tool change at front and back
- Automatic length measuring of the tools
- Continuous production without loading times
- Easy operation and programming

Options
- Automatic drill sharpening unit
- Y-axis ball screw for smart-5 (standard in case of roto-10)
- Software interface and drawing programs
- PC-link

Flexible configuration, solid quality
The topDRILL RX can be configured depending on the customer’s requirements. In addition to the two types of tool changer, the modular extension of the machine length, the choice between two machine heights as well as the freely definable direction of movement give a range of customizing options. All drilling and countersinking operations are precisely produced in one clamping process. The torque control prevents glass breakage during countersink drilling. Standard includes processing of both float and laminated safety glass sheets.

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</tr>
<tr>
<td>Glass thickness</td>
<td>1.300 mm</td>
</tr>
<tr>
<td>3 - 30 mm</td>
<td>2.400 mm</td>
</tr>
<tr>
<td>Minimum size</td>
<td>600 x 160 mm</td>
</tr>
<tr>
<td>Maximum size</td>
<td>ca. 3,200 mm, can be increased up to 8,000 mm with extension modules</td>
</tr>
<tr>
<td>Transport height</td>
<td>400 mm</td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7° (+/− 1°)</td>
</tr>
<tr>
<td>Max. bore diameter</td>
<td>80 mm</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>0 – 5,000 rpm</td>
</tr>
<tr>
<td>Spindle power (rating)</td>
<td>2 x 5.5 kW</td>
</tr>
<tr>
<td>Number of tools</td>
<td>5 + 5 in case of smart 5 / 10 + 10 bei speed 10</td>
</tr>
<tr>
<td>Maximum load</td>
<td>150 kg/lm</td>
</tr>
</tbody>
</table>

Highlights
- Compact, modular design
- Automatic tool change at front and back
- Automatic length measuring of the tools
- Continuous production without loading times
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Options
- Automatic drill sharpening unit
- Y-axis ball screw for smart-5 (standard in case of roto-10)
- Software interface and drawing programs
- PC-link

Flexible configuration, solid quality
The topDRILL RX can be configured depending on the customer’s requirements. In addition to the two types of tool changer, the modular extension of the machine length, the choice between two machine heights as well as the freely definable direction of movement give a range of customizing options. All drilling and countersinking operations are precisely produced in one clamping process. The torque control prevents glass breakage during countersink drilling. Standard includes processing of both float and laminated safety glass sheets.
topDRILL RX
Cycle times and scope of processing

The RX is the ideal solution for all drilling and countersinking processes. All machine configurations allow fast, flexible and high-quality processing.

Glass sheet
- Dimensions: 1,000 x 1,000 mm
- 10 drillings standard

Cycle time for the entire processing: 160 seconds

Glass sheet
- Dimensions: 1,000 x 1,000 mm
- 4 drillings, countersunk double-sided

Cycle time for the entire processing: 160 seconds

Single-action door
- Dimensions: 800 x 2,000 mm
- 6 drillings, all countersink drilling

Cycle time for the entire processing: 320 seconds

Intelligent and fast cycle
- Simultaneous drilling from front and back (starting at 6mm) – for faster cycle times
- Simple tool changing during drilling or countersinking – cycle time reduction
- 5 resp. 10 drills or countersinks per side, individually programmable
- Automatic calculation of the drill depth using a stored formula

Easy operation
- Fully automated processing, no adjustments on the machine required
- Fully automatic recognition and adjustment of the drill length resp. drilling parameters
- Programming, data import or adjustments also during the operation
- User manual and spare parts list available online on the screen

Fast glass handling
- No set-up times for positioning the suction cups
- Different glass sizes, shapes and thicknesses without changeover
- Loading of the next glass sheet during the processing
- Trouble-free combination with previous or following module (e.g. washing machine)
The topDRILL nc is a fully automatic double-sided glass drilling machine with digital drilling heads and an automatic glass transport. All movements are controlled via the 15 inch display, manual adjustments are not required. The drills are automatically measured after every change, the operator only has to mount the glass sheet and start the program. Glass thicknesses of up to 40 mm and drilling diameters of up to 100 mm support a flexible production.

**Freely configurable**

The topDRILL nc can be configured according to the customer’s requirements. The modular extension of the machine length, the choice between two machine heights as well as the freely definable direction of movement give a range of customizing options. Versatile extensions – such as an automatic drill sharpening unit or a data connection to an ERP system – allow adapting the topDRILL nc to the specific requirements of the production.

**Technical Data**

<table>
<thead>
<tr>
<th></th>
<th>topDRILL 130 nc</th>
<th>topDRILL 240 nc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass height</td>
<td>Open at the top</td>
<td>2,600 mm</td>
</tr>
<tr>
<td>Max. processing height</td>
<td>1,300 mm</td>
<td>2,400 mm</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>3 - 40 mm</td>
<td></td>
</tr>
<tr>
<td>Minimum size</td>
<td>600 x 150 mm</td>
<td></td>
</tr>
<tr>
<td>Maximum size</td>
<td>ca. 3,200 mm, can be increased up to 8,000 mm with extension modules</td>
<td></td>
</tr>
<tr>
<td>Transport height</td>
<td>600 mm</td>
<td></td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7° (+/- 1°)</td>
<td></td>
</tr>
<tr>
<td>Max. bore diameter</td>
<td>100 mm</td>
<td></td>
</tr>
<tr>
<td>Spindle speed</td>
<td>0 - 5,000 rpm</td>
<td></td>
</tr>
<tr>
<td>Spindle power (rating)</td>
<td>2 x 5.5 kW</td>
<td></td>
</tr>
<tr>
<td>Maximum load</td>
<td>150 kg/lm</td>
<td></td>
</tr>
</tbody>
</table>

**Highlights**

- Very compact construction and modular design
- Automatic drill sharpening unit
- Automatic drilling length measuring
- All movement axes with serve motors
- Simple operation and programming
- PC-link

**Options**

- Automatic drill sharpening unit
- Quick-change system for CMX drills
- Software interface and drawing programs
- PC-link

---

* Water consumption if used with a water treatment system
** Extension modules
**topDRILL easy**

**Vertical Double-sided Drilling Machine**

The topDRILL easy is a double-sided glass drilling machine with digital display for motorized setting of the drilling height. The manual handwheel allows fine adjustments to 1/10 mm. Marking the drill holes or additional laser markings are no longer necessary. The length adjustment via a double row of foldable, serial limit stops allows rapid processing of glass sheets of the same size. The glass sheet is transported manually. The patented drilling depth adjustment and the operation via central hand lever at the front render any adjustment for the glass thickness unnecessary. The drilling speed can be adjusted continuously, a selector switch activates one-sided drilling.

**Configuration options**

Extension modules allow an easy extension of the maximum possible processing glass length of the topDRILL to the customer’s requirements. The optional DRITOP CMX quick-change system minimizes the set-up times of the machine. The topDRILL easy offers convincing arguments with its demonstrable, decades-long durability as well as its high precision with easy operation.

**Technical Data**

<table>
<thead>
<tr>
<th>topDRILL 130 Easy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Glass height</strong></td>
<td>Open at the top</td>
</tr>
<tr>
<td><strong>Max. processing height</strong></td>
<td>1,300 mm</td>
</tr>
<tr>
<td><strong>Glass thickness</strong></td>
<td>3 - 30 mm</td>
</tr>
<tr>
<td><strong>Minimum size</strong></td>
<td>200 x 100 mm</td>
</tr>
<tr>
<td><strong>Maximum size</strong></td>
<td>2,500 x 1,500 mm</td>
</tr>
<tr>
<td><strong>Transport height</strong></td>
<td>600 mm</td>
</tr>
<tr>
<td><strong>Angle of inclination</strong></td>
<td>7° (+/- 1°)</td>
</tr>
<tr>
<td><strong>Max. bore diameter</strong></td>
<td>100 mm</td>
</tr>
<tr>
<td><strong>Spindle speed</strong></td>
<td>0 – 5,000 rpm</td>
</tr>
<tr>
<td><strong>Spindle power (rating)</strong></td>
<td>2 x 5.5 kW</td>
</tr>
<tr>
<td><strong>Maximum load</strong></td>
<td>100 kg/m</td>
</tr>
</tbody>
</table>

**Highlights**

- Very compact, modular design
- Single lever operation of the entire drilling process
- Motorized setting of the drilling height with digital display
- Patented system for the adjustment of drilling depth and drill wear

**Options**

- CMX Drill Quick-Change System

---

*Water consumption if used with a water treatment system
**Extension modules*
The WRA-B1500 water treatment system, which supplies your equipment with perfectly clean and reusable water, is the water saving solution for all kinds of processing machines. Optionally the water treatment system can be equipped with a 1200-liter reservoir, which supplies CNC machines with water through pumps and piping systems.

The best possible way of separating dirt particles from water is to add flocculant and mix it with the dirty water, and to use a lamella package. The sludge that deposits is automatically drained to the big bag underneath. An integrated lift pump simultaneously pumps excess water back to the system. This sophisticated concept reduces the amount of waste water to a minimum. Full big bags can be easily removed and disposed using the integrated heavy-lift trolley.

The WRA’s modular design allows you to remain flexible. The system requires little space and has a low construction height. The corrosion-resistant, compact and solid stainless steel construction makes it a future-proof investment in the efficiency of your production.

### Highlights
- **Saves water**
  The sophisticated system supplies the maximum amount of reusable water
- **Increases production, reduces maintenance**
  The time consuming cleaning of tanks and machines is kept to a minimum
- **Plug & play**
  No need for individual control of the WRA thanks to the control system of the connected CNC machine

### Technical Data

<table>
<thead>
<tr>
<th>WRA-B1500</th>
<th>L (mm)</th>
<th>B (mm)</th>
<th>H (mm)</th>
<th>Power consumption (kW)</th>
<th>Operating air pressure (bar)</th>
<th>Air consumption (m³/d)</th>
<th>Cleaning capacity max. (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRA-B1500</td>
<td>2,121</td>
<td>1,339</td>
<td>3,076</td>
<td>0.02</td>
<td>6</td>
<td>12</td>
<td>250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capacity</th>
<th>1.5 m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>610 kg</td>
</tr>
</tbody>
</table>
Overview washing machines

<table>
<thead>
<tr>
<th>Schraml topCLEAR Machines</th>
<th>ECO</th>
<th>SPECIAL</th>
<th>SUPER</th>
<th>TCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness 3-12 mm</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass thickness 3-20 mm</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Transport height</td>
<td>600 mm</td>
<td>600 mm</td>
<td>600 mm</td>
<td>520 mm / 720 mm</td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7°</td>
<td>7°</td>
<td>7°</td>
<td>6°</td>
</tr>
<tr>
<td>Distance between rollers only 120 mm</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>All transport rollers individually driven, ball bearing mounted</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Rollers with slip clutch on input and output module</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Basic frame, machine body and water tank in stainless steel</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Doors front- and rear side, guards in polycarbonate</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Spraying tubes for brushes and rinsing section plastic</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spraying tubes for brushes and rinsing section stainless steel</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glass support frame for drying section in stainless steel</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Water heating with adjustable thermostat</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sensor for water level and protection resistance</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Submersible pump with stainless rotor</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High-pressure centrifugal pump with filter</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Noise reduction box for ventilator, with air filter</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Additional driving motors with bottleneck function</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Light panels on outlet side</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>AutoStart System with inverter for soft-start of brushes</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pre-washing area with high pressure pump, separate tank</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Soft brushes frontside for soft coated glass</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ Standard, ○ Optional, - Not Available

We have been supplying and installing the glass washing machines of the topCLEAR series for about 20 years. With the gathered experience of over 600 installations, the washing machines have been constantly optimized and adapted to the changing customer requirements. topCLEAR washing machines are currently available in 3 different models. All of them can be expanded with a variety of useful equipment options. We are sure we can provide the right solution for your requirements.

Many advantages included in the standard:

- Stainless design of base frame and machine body as well as all built-in components in the washing zone
- Narrow roller spacing inside and outside the machine for safe, problem free processing of short glasses
- Sound absorption box for fan perfectly insulates against operational noise
- Clear, easy to use operating units
- Partially or fully automatic water circulation system saves energy and resources
- Extensive and clear documentation for operation and maintenance tasks

Extensions and additional modules

Depending on the customer’s requirements, the topCLEAR washing machines can be equipped with additional inlet and outlet modules. Those modules can of course be adapted to your needs in working height and equipment.

Combination with other devices

The topCLEAR series is ideal for combination with other devices. Both vertical grinding and drilling machines, as well as feeding systems, film applicators or tilting tables – even from non-LiSEC manufacturers – can be easily connected.
topCLEAR ECO
Washing machine

topCLEAR ECO is our basic machine for professional glass processing. All parts in contact with water are made from stainless materials. The standard version is already over-equipped with all practical features.

**Technical Data**

<table>
<thead>
<tr>
<th></th>
<th>topCLEAR 13 ECO 4/12</th>
<th>topCLEAR 13 ECO 4/20</th>
<th>topCLEAR 16 ECO 4/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. processing height</td>
<td>1,300 mm</td>
<td>1,300 mm</td>
<td>1,600 mm</td>
</tr>
<tr>
<td>Construction</td>
<td>Open at the top</td>
<td>Open at the top</td>
<td>Open at the top</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>4 - 12 mm</td>
<td>4 - 20 mm</td>
<td>4 - 12 mm</td>
</tr>
<tr>
<td>Minimum size</td>
<td>270 x 50 mm</td>
<td>300 x 50 mm</td>
<td>270 x 50 mm</td>
</tr>
<tr>
<td>Length of the inlet table</td>
<td>1,400 mm (optional 2,000 mm) - modularly expandable</td>
<td>2,000 mm (optional 2,800 mm) - modularly expandable</td>
<td></td>
</tr>
<tr>
<td>Length of the outlet table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7° (+/- 1°)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport height</td>
<td>600 mm (+/- 20 mm) / optional increase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of brushes</td>
<td>4 brushes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport speed</td>
<td>1 - 5 m/min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Options**

- Rollers with slip clutch
- Light panels on outlet side
- Soft brushes frontside for soft coated glass

**Highlights**

- All important machine components made from stainless steel
- Individual water pump for each pair of brushes
- Water heating system with thermostat
- Variable working speed with variator
- Noise reduction box for ventilator

- Optimized glass transport
  - Distance between rollers only 120 mm
  - Each roller individually driven
  - Suitable for small pieces

- Well thought-out design
  - Washing brushes with shaft in stainless steel
  - Extra strong clamping of glass
  - Compact installation

- Water management
  - Water tank with individual pump for each pair of brushes
  - Water heating with thermostat
  - Water filter
topCLEAR Special
Washing machine for professional cleaning of glass up to 12 mm thickness

topCLEAR Special is the perfect washing machine for industrial glass processing, as long as no extreme glass thicknesses are processed. A particular advantage is the extremely easy access to the machine for user-friendly maintenance. topCLEAR Special can be individually configured to meet the needs of solar production and multi-shift operation.

**Technical Data**

<table>
<thead>
<tr>
<th></th>
<th>topCLEAR 13 Special 4/12</th>
<th>topCLEAR 16 Special 4/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. processing height</td>
<td>1.3 m</td>
<td>1.6 m</td>
</tr>
<tr>
<td>Construction</td>
<td>Open at the top</td>
<td>Open at the top</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>4 - 12 mm / 4 - 20 mm</td>
<td></td>
</tr>
<tr>
<td>Minimum size</td>
<td>270 x 50 mm</td>
<td></td>
</tr>
<tr>
<td>Length of the inlet table</td>
<td>1,400 mm (optional 2,000 mm) - modularly expandable</td>
<td>2,000 mm (optional 2,800 mm) - modularly expandable</td>
</tr>
<tr>
<td>Length of the outlet table</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7° (+/- 1°)</td>
<td></td>
</tr>
<tr>
<td>Transport height</td>
<td>600 mm (+/- 20 mm) / optional increase</td>
<td></td>
</tr>
<tr>
<td>Number of brushes</td>
<td>4 brushes</td>
<td></td>
</tr>
<tr>
<td>Transport speed</td>
<td>1 - 5 m/min</td>
<td></td>
</tr>
</tbody>
</table>

**Highlights**

- All important machine components made from stainless steel
- Doors front- and rearside as maintenance entry
- Guards in polycarbonate behind the doors
- Individual water pump for each pair of brushes

**Options**

- Rollers with slip clutch
- AutoStart system for power saving
- Light panels on outlet side
- Pre-washing area with high pressure pump, separate tank
- Soft brushes frontside for soft coated glass

**Simple operation**

- Ingenious - AutoStart system activates brushes, pump and ventilator only when needed (optional).

**Optimal accessibility**

- Doors front- and rearside for easy maintenance
- Plexiglas guards for inspection
- Additional noise reduction
**TopCLEAR Super**

Professional series for thick-glass processing up to 20 mm

TopCLEAR Super is what we call our extremely robust series for thick glass processing, especially grinding. Any glass thickness up to 20 mm can be processed without further adjustment.

### Technical Data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. processing height</td>
<td>1,300 mm</td>
<td>1,600 mm</td>
<td>2,000 mm</td>
<td>2,500 mm</td>
</tr>
<tr>
<td>Construction</td>
<td>Open at the top</td>
<td>Open at the top</td>
<td>Closed at the top</td>
<td>Closed at the top</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>4 - 20 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum size</td>
<td>320 x 50 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of the inlet table</td>
<td>2,000 mm (optional 2,800 mm) - modularly expandable</td>
<td>2,800 mm - modularly expandable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>7° (+/- 1°)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport height</td>
<td>600 mm (+/- 20 mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of brushes</td>
<td>4 brushes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport speed</td>
<td>1-5 m/min</td>
<td>1-5 m/min</td>
<td>1-5 m/min</td>
<td>1-6 m/min</td>
</tr>
</tbody>
</table>

### Professional series for thick-glass processing up to 20 mm

TopCLEAR Super is what we call our extremely robust series for thick glass processing, especially grinding. Any glass thickness up to 20 mm can be processed without further adjustment.

#### Highlights
- Stronger machine frame in stainless steel
- Doors front- and rear side, polycarbonate guards
- Individual water pump for each pair of brushes
- Sensor for water level and shutdown
- High pressure centrifugal pumps made of stainless steel

#### Options
- Rollers with slip clutch
- AutoStart system for power saving
- Light panels on outlet side
- Pre-washing area with high pressure pump, separate tank
- Soft brushes frontside for soft coated glass

#### Optimized water management
- Stainless steel centrifugal pump below washing area
- Water tank with heating
- Sensor for water level with indicator lamp

#### Well thought-out drive concept
- Overhead drive for brushes and glass transport
- Individual motor per brush or per pair of brushes (if closed construction)
Technical Data

**TCL**

<table>
<thead>
<tr>
<th></th>
<th>TCL-A16</th>
<th>TCL-A20</th>
<th>TCL-A27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. processing height</td>
<td>1,600 mm</td>
<td>2,000 mm</td>
<td>2,700 mm</td>
</tr>
<tr>
<td>Construction</td>
<td>Open at the top</td>
<td>Open at the top</td>
<td>Closed at the top</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>4 - 20 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum size</td>
<td>320 x 50 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of inclination</td>
<td>6°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport height</td>
<td>520 mm (+/- 20 mm) / 720 mm (+/- 20 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport speed</td>
<td>1-5 m/min</td>
<td>1-6 m/min</td>
<td></td>
</tr>
<tr>
<td>Number of brushes</td>
<td>4 brushes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**VHW-E**

<table>
<thead>
<tr>
<th></th>
<th>VHW-E20</th>
<th>VHW-E25</th>
<th>VHW-E27</th>
<th>VHW-E33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass height</td>
<td>2 m</td>
<td>2.5 m</td>
<td>2.7 m</td>
<td>3.3 m</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>2 - 60 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum size</td>
<td>350 x 180 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating unit for the washer</td>
<td>Integrated hot water generation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of brushes</td>
<td>4 brushes (VHW-D/4), 6 brushes (VHW-D/V6), 8 brushes (VHW-D/V8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport speed</td>
<td>8 m/min (4 brushes), 12 m/min (6 brushes), 15 m/min (8 brushes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum load</td>
<td>250 kg/3m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Highlights**

- TCL: Optimised for integration in LiSEC lines
- TCL is the perfect choice if you wish to incorporate a washing machine from the topCLEAR range in a LiSEC processing line. TCL is ideally suited for use on LiSEC lines, in terms of transport height and angle of inclination as well as of machine design. TCL impresses with its extremely robust design and its very good washing result, especially in the grinding area. The standard version can wash glass thicknesses of up to 20 mm.
- VHW-E: Automatic washing and drying plant for flat glass
- Our newly developed washing and drying plant offers our customers the possibility to start with a washing machine for basic requirements and to gradually (even over years) adjust and upgrade this machine to meet their growing needs. But not only its flexible upgradability, also the extreme revision of the functional and technical facilities of this plant offer significant benefits.

**Options**

- TCL: Shapes according to the LiSEC shape catalog
- VHW-E: AutoStart system for power saving
- Pre-wash zone with high-pressure pump and filter
- Soft brushes at front for Low-E glass sheets
- Shapes according to the LiSEC shape catalog
- Speed control for rolling brushes front/rear
- Automatic coating detection
- 1000l tank and sand filter
- Brushes with denser bristles
- Additional pair of brushes for the main washing zone
- Additional heating element for the integrated heating tank
- Water temperature and conductance monitoring

**Technical Data**

- **Max. processing height**: TCL-A16 1,600 mm, TCL-A20 2,000 mm, TCL-A27 2,700 mm
- **Construction**: Open at the top (TCL-A16, TCL-A20), Closed at the top (TCL-A27)
- **Glass thickness**: 4 - 20 mm
- **Minimum size**: 320 x 50 mm
- **Angle of inclination**: 6°
- **Transport height**: 520 mm (+/- 20 mm) / 720 mm (+/- 20 mm)
- **Transport speed**: 1-5 m/min (TCL-A16, TCL-A20), 1-6 m/min (TCL-A27)
- **Number of brushes**: 4 brushes

- **Glass height**: VHW-E20 2 m, VHW-E25 2.5 m, VHW-E27 2.7 m, VHW-E33 3.3 m
- **Glass thickness**: 2 - 60 mm
- **Minimum size**: 350 x 180 mm
- **Heating unit for the washer**: Integrated hot water generation
- **Number of brushes**: 4 brushes (VHW-D/4), 6 brushes (VHW-D/V6), 8 brushes (VHW-D/V8)
- **Transport speed**: 8 m/min (4 brushes), 12 m/min (6 brushes), 15 m/min (8 brushes)
- **Maximum load**: 250 kg/3m
The processing of flat glass constitutes a challenge for the operator, the system and also for ongoing quality control. It is not only the external dimensions that must fit perfectly. Above all, the position and quality of cutaways and bores must comply perfectly with specifications.

PerfectScan detects automatically whether it is dealing with single glass or laminated glass, and on the basis of these or other freely selectable criteria, it can check the quality automatically.

With the PerfectScan inspection, you can guarantee products of a better quality, and can substantially reduce complaint levels.

**Technical Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass height</td>
<td>200 - 3,400 mm</td>
</tr>
<tr>
<td>Maximum length</td>
<td>6,000 mm</td>
</tr>
<tr>
<td>Glass thickness</td>
<td>2 - 100 mm</td>
</tr>
<tr>
<td>Transport speed</td>
<td>48 m/min at 200 dpi (no interpolation)</td>
</tr>
<tr>
<td>Scan technology</td>
<td>16 bit Scannodule (LIS – Lightning Imaging Sensor)</td>
</tr>
<tr>
<td>Light transmission</td>
<td>15 – 99 %</td>
</tr>
</tbody>
</table>
SOFTWARE

With our broad product portfolio we offer our customers a modular set-up, from single-user to complex group solutions with central administration and decentralized sales and production branches.

Our whole team supports the development and service of our products, with the goal of generating the greatest benefit for our customers.
**cadcam**

**CAD solution for flat glass processing**

Its full integration into the order processing and production planning solutions makes cadcam the best construction program for the glass processing sector. Specifically developed functions support the construction of all imaginable product variants. cadcam can also be integrated as a stand-alone construction program within your existing software landscape.

**Functions**

- Full range of functions of a CAD/CAM system
- LiSEC shape catalogue
- Variable graphics
- Supporting digitizing tables
- Automatic calculation of grinding additions
- Automatic calculation of decoating contour for edges and cutouts
- Administration of cutouts/fittings
- Supported formats: .DXF & LiSEC formats (.ZEI & .GPS)

**Highlights**

- Simple placement of complex cutouts/fittings from the catalogue
- Optimisation and smoothing of contours are crucial for continuous cutting
- Low training efforts due to intuitive and user-friendly graphical interface
- Integration depth up to the processing machine (CNC code converter)
- Extension of your shape catalogue with own drawings

**scancam**

**Digitalisation of templates**

LiSEC offers an easy to use system for creating a contour from a digital photo of the template. The contour can then be processed further with a CAD software. scancam automatically corrects photos taken with a digital camera for perspective distortions and generates a DXF file which can be imported by cutting and processing machines. scancam can also be integrated as a stand-alone version within your existing software landscape, as the generated DXF format is compatible with all common CAD programs.

**Functions**

- Automatic detection of reference points
- Correction of perspective distortions
- Continuous zoom for accurate contour detection
- Numerous software tools like „Close Corner“ to process the contour further

**Highlights**

- Portable – Contours can be created at the construction site
- Easy to use – Intuitive graphical user interface
- Compatible – Data output in DXF format
- Automatic contour detection on a black background

Sample view of data display, offline test, and declaration of performance
The LiSEC software solutions cockpit and lineserver provide the interface between the production planning and the processing line. The combined system at the line automatically receives the data from production planning in the predefined sequence and generates the required production data for each machine.

**cockpit/lineserver**

**Control and Monitoring of Processing Line**

**Functions**
- Import of production batches
- Input editor for manual entry of single productions
- Supplying CNC-data for the single plant parts
- Feedback of ready messages and remakes

**Highlights**
- Facilitates automatic production of free shapes (DXF)
- Informing all affected stations if a glass sheet breaks
- Production control and monitoring supported by line overview
- Quality assurance through integration of LiSEC quality scanner

![Image](image.png)

**ident**

**Information and Ready Messaging Terminal at the Production**

The main function of ident is to inform the user within the production about relevant details resp. to register remakes and ready messages and transfer the information to the ERP system. The program also supplies work step specific information (e.g. shape position) and generates control codes for machines from third-party suppliers.

**Functions**
- Display of production drawings
- Entry of rack number and stock location
- Entry of remakes
- Online connection to processing machines
- Synchronising to other ident
- Material management
- Label printout (switching production / customer label)
- Status display

![Image](image.png)
assetcheck is an indispensable component of the LiSEC product range. Machine status data are collected in real time directly by the machine’s control system and stored in a central place for displaying and analysing. If required, this information can be provided to the production manager, the quality manager, the board or everyone else, who needs them, everytime and everywhere on mobile devices (e.g. smartphones).

Through continuous determination of your performance data and the outcome awareness, you can promptly influence your production and therefore raise your machine availability and output.

**Highlights**

- Proactive planning of maintenance for reducing downtimes
- Point out and analyse downtimes
- Individually configurable
- Machine data available everywhere and real-time as alarms, cycle time, status, recipes, tool information, consumption data, production figures

**Functions**

- Display of actual machine status
- Generate your own views
- Display of past machine status
- View and analyse of alarm data, exit messages, downtime data, maintenance data
- Generate your own reports
- Pre-defined hit lists
- Reporting / charts / graphics
- Pre-defined reports as cycle time calculation per machine

**Individually configurable**

It is very simple to define different views with varying degrees of detail to meet the requirements of different users. It is possible to zoom in from a global overview down to detailed process parameters.

**Analysis function**

The collected data and messages can be analyzed using pre-defined hit lists as well as freely configurable reports. The creation of reports is supported by the integrated reporter module.

**Current machine status display**

The main indicator necessary for a quick overview of all machines is the machine status. At a glance, it is possible to see whether the machine is in automatic mode or if an error has been reported.

Transparent Production: Data flow from machines to the server

**Machine Status Monitoring Software**

assetcheck is an indispensable component of the LiSEC product range. Machine status data are collected in real time directly by the machine’s control system and stored in a central place for displaying and analysing. If required, this information can be provided to the production manager, the quality manager, the board or everyone else, who needs them, everytime and everywhere on mobile devices (e.g. smartphones).

Through continuous determination of your performance data and the outcome awareness, you can promptly influence your production and therefore raise your machine availability and output.

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- Individually configurable
- Machine data available everywhere and real-time as alarms, cycle time, status, recipes, tool information, consumption data, production figures

**Functions**

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- Generate your own views
- Display of past machine status
- View and analyse of alarm data, exit messages, downtime data, maintenance data
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- Pre-defined hit lists
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The collected data and messages can be analyzed using pre-defined hit lists as well as freely configurable reports. The creation of reports is supported by the integrated reporter module.

**Current machine status display**

The main indicator necessary for a quick overview of all machines is the machine status. At a glance, it is possible to see whether the machine is in automatic mode or if an error has been reported.

Transparent Production: Data flow from machines to the server
Live production data available on your smartphone.
Machines and systems for flat glass processing are in use for many years, sometimes even for decades. Ongoing maintenance and optimisation are essential to keep performance, efficiency and availability at a consistently high level and to ensure high-quality glass products.
Services

We offer you worldwide service and the fastest possible supply of spare parts.

From machine installations to modernization of existing systems, we offer a wide range of services, and stay on your side as a competent and reliable partner throughout the entire life cycle of your systems. Whether you need a customized training program, detailed machine inspections, online support, spare parts or upgrades – the LiSEC service team will take care of it for you.

Facts & figures:
- 160 service engineers worldwide
- 28 branch offices/representatives
- Service for around 390 different machine types
- Approx. 4,700 customer locations in over 100 countries worldwide
- The largest global service network in the glass industry
- One-of-a-kind in the industry: Competence through operators’ know-how

Service Products
- Online Support
- Hotline
- Service / Maintenance
- Training
- Long Life
- Spare parts
- Installation
- Repairs

Hotline

LiSEC attributes great importance to customer efficiency from the very beginning.

The company is now taking it to a new level of quality.

Monday - Thursday  07:00 a.m. - 04:30 p.m. (CET)
Friday  07:00 a.m. - 12:00 a.m. (CET)

Phone: +43-7477 405-5701
E-Mail: aftersales@lisec.com

Online Support

Preventive check-ups and maintenance ensure high plant availability, keep production output at the desired level and prevent unexpected plant downtimes.

Sunday 10:00 p.m. - Friday 09:00 p.m. (CET)

Phone: +43-7477 405-5701
E-Mail: aftersales@lisec.com

Emergency contact for urgent issues outside our working hours:

Saturday  6:00 a.m. - 10:00 p.m. (CET)
Sunday  6:00 a.m. - 10:00 p.m. (CET)

Phone: +43-7477 405-5701
LiSEC Glass Forum

Competence Center for research, production and training in the field of flat glass processing

The new LiSEC Competence Center for research, production and training in the field of flat glass processing was opened in Hausmenning at the end of 2015. It aligns completely with the LiSEC claim „Best in Glass Processing“. The Competence Center „Glass Forum“ makes LiSEC the only machine manufacturer on the market who profitably processes flat glass. This operator know-how allows LiSEC to share and therefore fully understand their customers’ problems and challenges. The „Glass Forum“, a LiSEC investment of approximately seven million Euros, accommodates the latest LiSEC technologies for each step of glass processing – from cutting and edge processing to a sophisticated sheet logistics system to the production of insulating glass units and laminated safety glass including tempering. In the Glass Forum, flat glass is processed under real life production conditions. The state-of-the-art plants and software applications are also used for research, testing and training.