Лазерные технологии CLT
Описание

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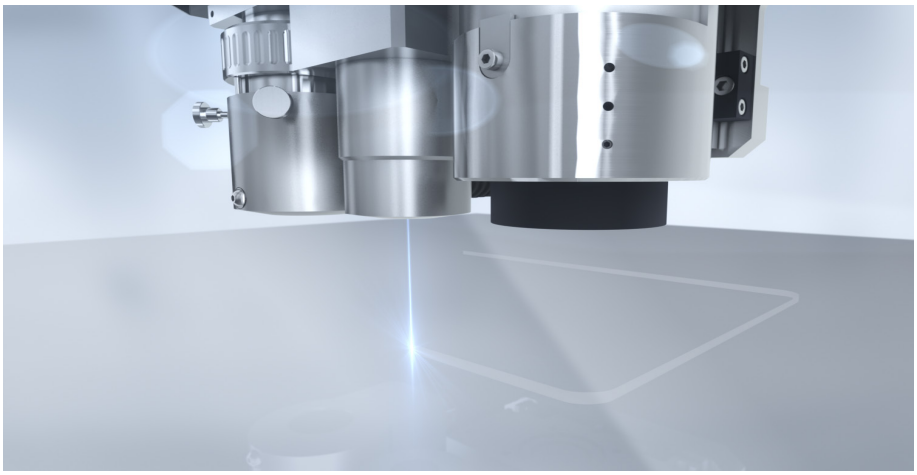


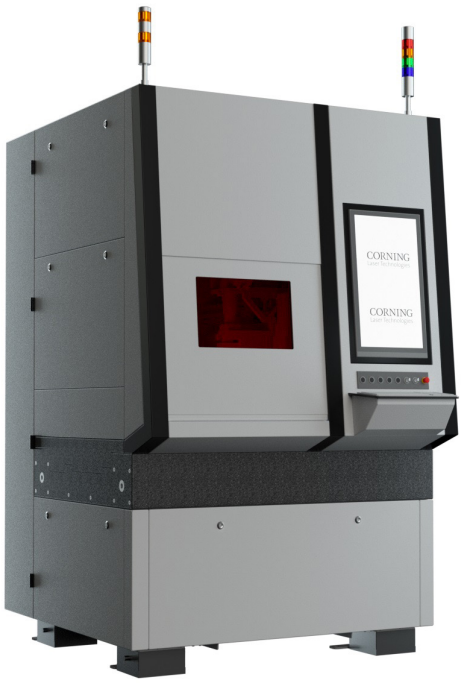
CLT 400S - WD

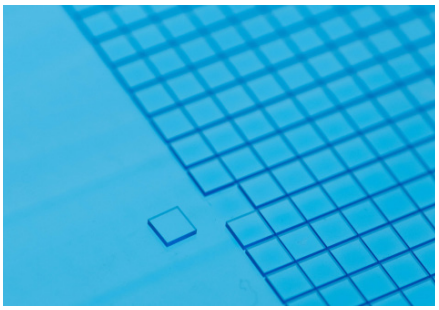
A Glass Wafer Laser Dicing Tool

The CLT 400S-WD is a glass wafer dicing tool that can be used for small die/narrow street applications where mechanical breaking is required. Based on our vast experience with the patented nanoPerforation process, Corning Laser Technologies (CLT) has developed a new laser modification method and combined it with a outstanding breaking technology to yield superior results and allow for industry-leading aspect ratios and highest quality standards.

Applications

- Micro-fluidics
- Micro-optics
- Meta-surfaces
- Glass wafer-based semiconductor applications
- Dicing of other brittle, transparent materials (e.g. sapphire)
- Coated and structured dies





Key Benefits

- Industry-leading dicing solution
- Capable of handling up to 300 mm wafers
- High quality and high-speed dicing process
- High yield due to lower breakage
- High utilization on die per wafer
- Clean and dry process
- Improved accuracy

The CLT's laser dicing process is a two-step approach of modification and separation: the modification of glass - wafers is done by CLT's well-established laser process while the separation can be realized by automated breaking on stretch tape. The results are increased processing speed, improved accuracy and minimal particle generation as well as increased utilization of wafers with small dies by more than 20%.

Unique Dicing Solution

Glass is becoming more prevalent in the Micro-fabrication segment. The CLT 400S - WD is pairing our CLT laser dicing technology with mechanical breakers. It offers a fully optimized solution as well as a one-stop-shop for glass wafer dicing applications. The design base level tool is modular and customizable and can be supplemented with add-ons, such as automation.

CLT 400S-WD Technical Specifications

Mechanics	Machine base and vertical structure are made from solid granite blocks X-Y-split axis design Z-axis motorized Machine optimized for high precision processing at high speed Class 1 laser safety chamber	
Axes	X-axis range 400 mm Y-axis range 400 mm Z-axis range 75/110 mm Max. traverse speed x/y-axis Positioning accuracy x (calibrated worktable) Positioning accuracy y (calibrated worktable) Axis repeatability	Drive: linear motor Drive: linear motor Drive: rotation motor Up to 1,000 mm/s @ 10 m/s² [2] +/- 2.5µm per 300 mm range [1] +/- 2.5µm per 300 mm range [1] < 2 µm [1]
CNC-Control	TwinCat 3 CNC control for all machine functions (G-code)	
Operator Interface	Based on Microsoft Windows 10 with CLT HMI	
Vision System	Integrated in standard configuration for fiducial recognition	
Loading	Manual loading of substrates	
Power Sensor	Integrated in standard configuration for process calibration	
Options	Height Sensing Modul Line Focus Camera Enhanced nanoPerforation External Beam Attenuator Monitoring Box	Motorized Mirrors 1D/2D Code Reader External Exhaust System External Chiller
Electrical Supply	Rating: Power consumption: (peak/ average)	400 Volts ±10%, 3Ph+N+PE, 50/60 Hz 4.0 - 18.0 kVA / 3.6 - 14.5 kVA
Cooling	Rating (peak/ average): Consumption:	3.3 - 5.0 kW/ 3.0 kW [2] min. 13 l/min; max. 26 l/min [2]
Compressed Air	Supply pressure: Consumption:	min. 6 bar / max. 8 bar [2] typ. 500 Nl/min
Exhaust Air from Machine Enclosure	Volume: Connector size / type at machine:	min. 50 m³/h exhaust air [2] 1x connector at 90 mm nominal diameter (OD)
Exhaust Air from Process Head	No requirement at customer site. Will be provided by an additional exhaust system	
Machine Size and Weight	Size: Width x Depth x Height: Weight:	1,400 x 1,400 x 2,650 mm (incl. signal lights) [2] 1,600 kg [2]
Temperature	Environment-controlled	

[1] In order to achieve the above-mentioned accuracy, the machine must be operated in an environment-controlled room.

[2] These values may vary, depending on the tool configuration, e.g. type of laser source.

Specifications are subject to change without notice.

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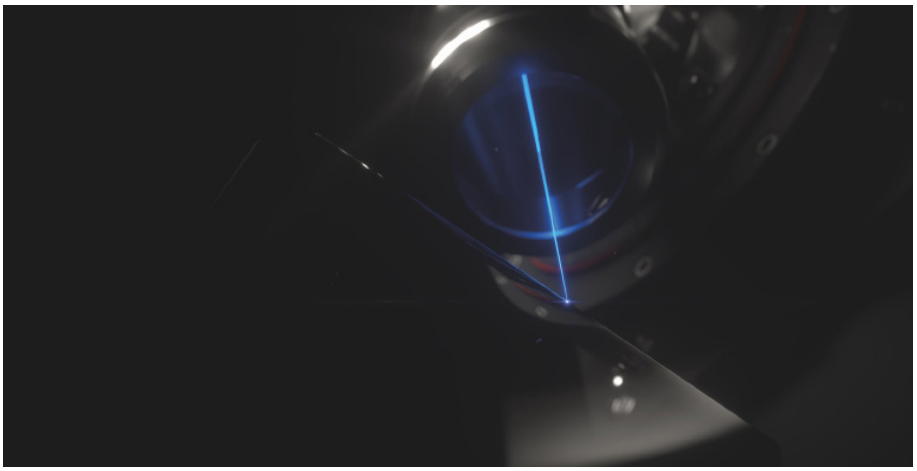
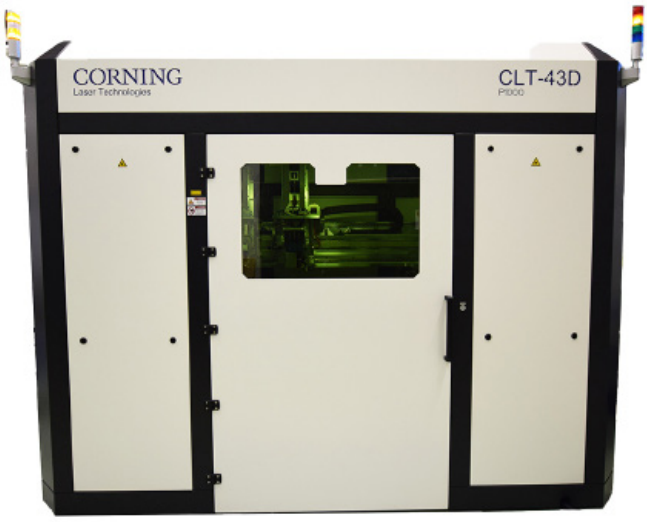


CLT 43D
Laser cutting of 3D shaped glass

There is a world wide trend towards cover glasses and glass dashboards with curved surfaces. These new designs have high requirements for freeform and 3D cutting, which are difficult to meet with traditional mechanical scribe and break (MS&B) processes.



nanoPerforation Cutting

To meet these demands, Corning Laser Technologies (CLT) has further improved its unique nanoPerforation glass cutting technology. Using ultrashort pulsed lasers, it cuts glass through localized perforation rather than material ablation. This results in smooth, very high quality cuts at high processing speeds.
CLT has further developed the nanoPerforation to also allow the cutting of 3D shaped glass. Thanks to the high edge quality of the nanoPerforation process, there is little or no post processing required. As laser cutting is contact-free, it does not need process fluids and there is no tool wear. All this reduces the total cost of ownership and makes CLT nanoPerforation not only more flexible, but also more cost effective than traditional MS&B processes.

Creative 3D Designs

When cutting 3D forms, the laser beam always has to be perpendicular to the glass surface. This is achieved through a specially developed, fast and highly precise CLT 5-axis beam delivery system.
Allowing freeform, near netshape cutting, the CLT solution gives you the freedom to realize innovative 3D designs for mobile devices, automotive dashboards, displays, consumer electronics and more.

Key Benefits

- Cuts straight, perpendicular and free-form lines
- Cuts extremely fast to maximize throughput
- Superior edge quality
- Precise cutting of 3D shaped glass
- Minimal particle generation

Your Solution

Our application lab will work with you to provide a complete solution tailored to your specific requirements. The CLT experts have many years of experience in laser technology and use state of the art metrology equipment for application development.

Technical Specifications

Axes	5-axis system 3D-processing volume Length x Width x Height Accuracy	 1,200 x 700 x 300 mm[1)] < +/- 100 µm for parts cut out of a substrate [2)]
CNC-Control	TwinCat 3 CNC control for all machine functions	
Operator Interface	Based on Microsoft Windows 10 with CLT HMI	
Machine Vision	CLT vision system integrated in standard configuration	
Laser Source	Integration of up to two (2) different laser sources Setups for different wavelengths available	
Process Head	Swivel Head Flying optics Combination of both	
Loading/Unloading	Manual loading of substrates / unloading of parts	
Electrical Supply	Rating: Power consumption (peak/ average)	400 Volts, 3Ph+N+PE, 50/60Hz (transformer available) 10.0 kW
Cooling	Rating (peak/ average): Consumption: :	7.0 kW/ 4.0 kW [3)] min. 20 l/min, max. 25 l/min [3)]
Compressed Air	Supply pressure: Consumption:	min. 6 bar / max. 8 bar [3)] typ. 560 Nl/min
Exhaust Air from Machine Enclosure	Volume:	min. 450 m^3/h exhaust air [3)]
Machine Vacuum	No requirement at customer site. Will be provided by a side channel blower inside the equipment.	
Machine Size and Weight	Size: Width x Depth x Height [3)] Weight	3,100 x 2,566 x 2,850 mm approx. 6,400 kg
Temperature	20 °C, Deviation +/- 2 °C , non condensing	

[1)] Nominal travel range. Effective travel range may be reduced by use of multiple process heads and/or cameras.

[2)] Environmental controlled room required.

[3)] These values may vary, depending on the tool configuration, e.g. type of laser source.

Specifications are subject to change without notice.

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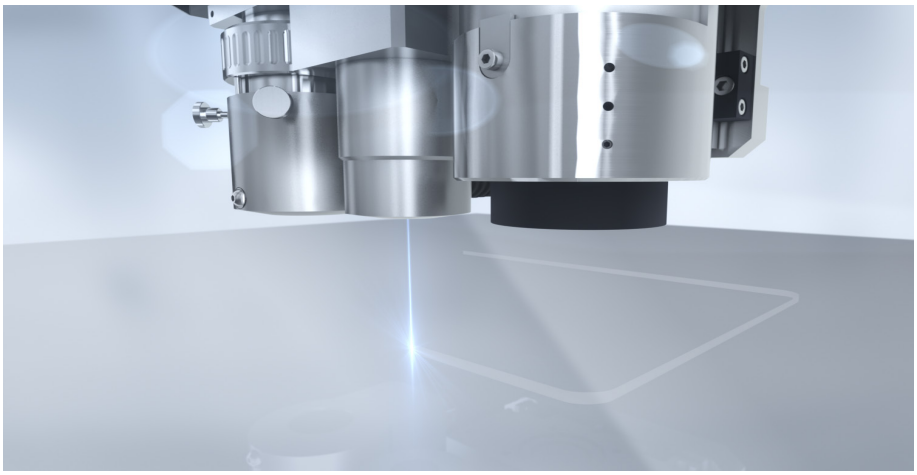

CLT 80G:

High-precision laser glass processing for up to Gen 8

The CLT 80G laser glass processing tool is designed for 24/7 manufacturing in an industrial environment, supporting a glass substrate size of up to 2,300 mm x 2,500 mm.
The Corning Laser Technologies systems are developed in close cooperation with the speciality glass experts at Corning. Their material science and optics knowledge adds unique advantages to this laser glass cutting process.

Applications

Advanced multi purpose and flexible laser machining system for:

Processing Glass Substrates

- Automotive windshields, roofs
- Automotive windshields, roofs, sidelites, backlites
- Automotive interior glass

Using ultra-short laser pulses, the CLT 80G cuts by material disassociation rather than ablation. The result is a very low surface roughness, increased as-cut edge strength and faster throughput. The Corning Laser Technologies process enables cutting fully strengthened glass, Corning® Gorilla® glass, un-strengthened glass, as well as other transparent glass and crystalline materials.

Key Benefits

- Free-form, net-shape or near net-shape cutting at up to 1m/s
- Cuts: curved, straight, perpendicular and angled lines as well as holes and slots
- Cuts glass from 0.4mm up to 6 mm in thickness
- Automatic/touch-free separation process
- Eliminates fluids and tooling required in traditional processing methods
- Consumer electronics
- Architectural glass
- Display technologies
- Coated substrates
- Thin glass
- Strengthened and non-strengthened glass
- Electronic components

This system is also extremely well suited for different kinds of Micro Material Processing, such as:

Other Materials

- Cutting of OLED, PI, wafer, plastic, and other brittle materials.

CLT 80G Technical Specifications

Mechanics	Machine base and vertical structure are made from solid granite blocks X-Y single or double gantry design available Z-axis motorized (CNC-axis) Machine optimized for high precision processing at high speed Class 1 laser safety chamber	
Axes	X-axis range 1,950 - 2,350 mm Y-axis range 2,500 - 2,950 mm Z-axis range 100 mm max. traverse speed x/y-axis max. acceleration Positioning accuracy Repeatability	Drive: linear motor [1)] Drive: linear motor [1)] Drive: rotation motor [1)] up to 1,000 mm/s (pattern dependent) up to 10 m/s^2 (pattern dependent) < 10 µm per 200 mm travel [2)] < 2 µm [2)]
CNC-Control	TwinCat 3 CNC control for all machine functions (G-code)	
Operator Interface	Based on Microsoft Windows 10 with CLT HMI	
Machine Vision	Integrated in standard configuration for fiducial recognition	
Loading / Unloading	Manual loading of substrates / unloading of parts	
Options	Automation available for loading and unloading (e.g. tilt table, parts picking unit) Glass waste management MES connection	
Electrical Supply	Rating: Power consumption : (peak/ average)	400 Volts, 3Ph+N+PE, 50/60 Hz (transformer available) 17.0 - 19.0 kVA / 15.3 - 17.1 kVA [3)]
Cooling	Rating (peak/ average): Consumption:	9.3 - 14.6 kW/ 6.0 - 10.4 kW [3)] min. 28 l/min, max. 36 l/min [3)]
Compressed Air	Supply pressure: Consumption:	min. 6 bar / max. 8 bar [3)] typ. 500 - 1,000 Nl/min
Exhaust Air from Machine Enclosure	Volume:	min. 3,000 m^3/h exhaust air[3)]
Exhaust Air from Vacuum Production	Volume:	up to 800 m^3/h exhaust air [3)]
Machine Vacuum	No requirement at customer site Will be provided by a side channel blower inside the equipment	
Machine Size and Weight	Size: Width x Depth x Height: Weight:	14,000 x 4,150 x 2,400 mm [3)] approx. 13,500 kg [3)]
Temperature	22 °C, Deviation +/- 2 °C , non condensing	

[1)] Nominal travel range. Effective travel range may be reduced by use of multiple process heads and/or cameras.

[2)] Environmental controlled room required.

[3)] These values may vary, depending on the tool configuration, e.g. type of laser source.

Specifications are subject to change without notice.

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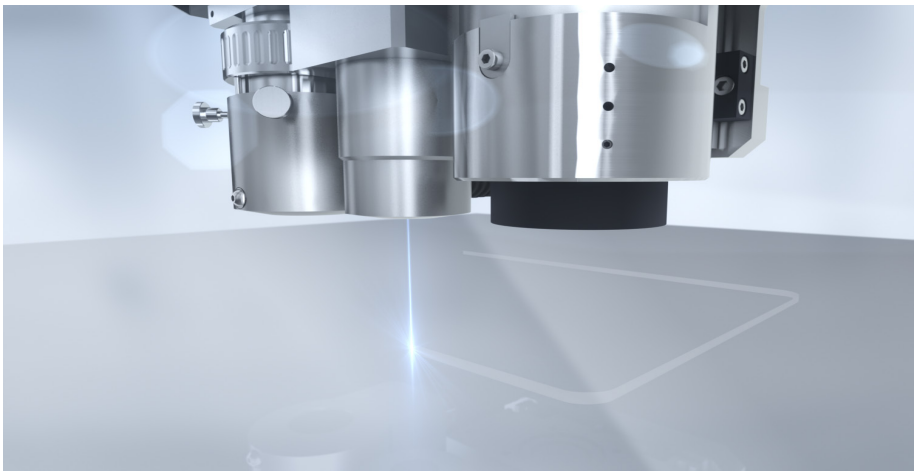
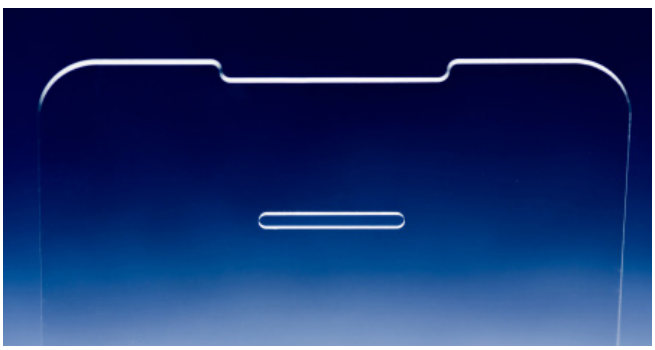


CLT 66G:

High-precision laser glass processing for up to Gen 6

The CLT 66G laser glass processing tool is designed for 24/7 manufacturing in an industrial environment, supporting a glass substrate size of up to GEN6 transfering into 1,500 mm x 1,850 mm.
The Corning Laser Technologies systems are developed in close cooperation with the speciality glass experts at Corning. Their material science and optics knowledge adds unique advantages to this laser glass cutting process.

Using ultra-short laser pulses, the CLT 66G cuts by material disassociation rather than ablation. The result is a very low surface roughness, increased as-cut edge strength and yield.
The Corning Laser Technologies process enables cutting fully strengthened glass, Corning® Gorilla® glass, un-strengthened glass, as well as other transparent glass and crystalline materials.



Key Benefits

- Free-form, net-shape or near net-shape cutting at up to 1m/s (depending on contur)
- Cuts: curved, straight, perpendicular and angled lines as well as holes and slots (depending on tool setup)
- Cuts glass from 0.4mm up to 6 mm in thickness
- Automatic/touch-free separation process (material de-pendend)
- Eliminates fluids and tooling required in traditional processing methods

Photo © Corning Incorporated

Applications:

Advanced multi purpose and flexible laser machining system for:

Processing Glass Substrates

- Automotive windshields, roofs, sidelites, backlites
- Automotive interior glass
- Consumer electronics
- Architectural glass
- Display technologies
- Coated substrates
- Thin glass
- Strengthened and non-strengthened glass
- Electronic components

This system is also extremely well suited for different kinds of Micro Material Processing, such as:

Other Materials

- Cutting of OLED, PI, wafer, ceramic, plastic, and other brittle materials.

CLT 66G Technical Specificationen

Mechanics	Machine base and vertical structure are made from solid granite blocks X-Y single or double gantry design available Z-axis motorized (CNC-axis) Machine optimized for high precision processing at high speed Class 1 laser safety chamber	
Axes	X-axis travel 1,300 - 1,550 mm Y-axis travel 2,000 - 2,400 mm Z-axis travel 100 mm max. traverse speed x/y-axis max. acceleration Positioning accuracy Repeatability	Drive: linear motor [1)] Drive: linear motor [1)] Drive: rotation motor [1)] up to 1,000 mm/s (pattern dependent) up to 10 m/s2 (pattern dependent) < 10 µm per 200 mm travel [2)] < 2 µm [2)]
CNC-Control	TwinCat 3 CNC control for all machine functions (G-code)	
Operating Interface	Based on Microsoft Windows 10 with CLT HMI	
Machine Vision	Integrated in standard configuration for fiducial recognition	
Loading / Unloading	Manual loading of substrates / unloading of parts	
Options	Automation available for loading and unloading (e.g. tilt table, parts picking unit) Glass waste management MES connection	
Electrical Supply	Rating: Power consumption (peak/ average):	400 Volt, 3Ph+N+PE, 50/60 Hz (transformator available) 15.0 - 22.0 kVA / 13.5 - 19.8 kVA [3)]
Cooling	Rating (peak/ average): Consumption:	9.3 - 14.6 kW/ 6.0 - 10.4 kW [3)] min. 28 l/min; max. 36 l/min [3)]
Compressed Air	Supply pressure: Consumption:	min. 6 bar / max. 8 bar [3)] typ. 500 - 1,000 Nl/min
Exhaust Air from Machine Enclosure	Volume:	min. 3,000 m^3/h exhaust air [3)]
Exhaust Air from Vacuum Production	Volume:	up to 800 m^3/h exhaust air [3)]
Machine Vacuum	No requirement at customer site Will be provided by a side channel blower inside the equipment	
Machine Size and Weight	Size: Width x Depth x Height: Weight:	11,460 x 3,400 x 2,400 mm [3)] approx. 10,500 kg [3)]
Temperature	22 °C, Deviation +/- 2 °C , non condensing	

1) Nominal travel range. Effective travel range may be reduced by use of multiple process heads and/or cameras.

2) Environmental controlled room required.

3) These values may vary, depending on the tool configuration, e.g. type of laser source.

Specifications are subject to change without notice.

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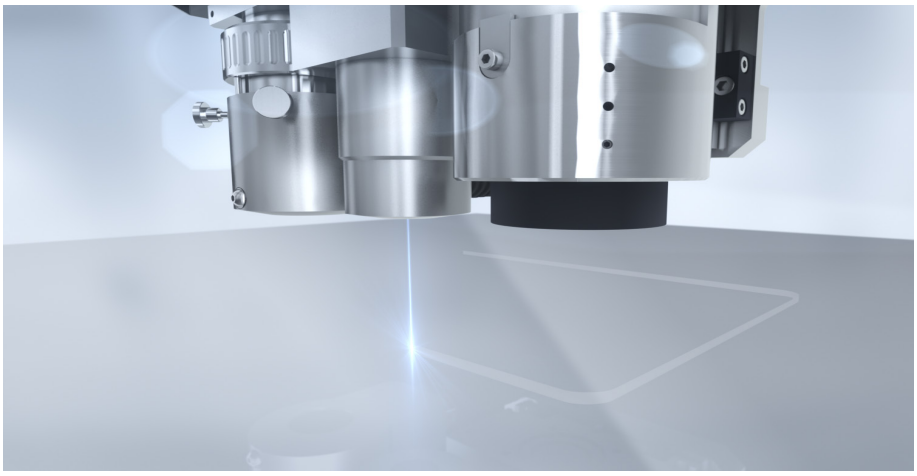

CLT 45G NX:

A multipurpose high-precision laser processing tool

The CLT 45G NX laser tool is designed for 24/7 production in an industrial environment. It´s versatility also makes it an ideal R&D tool.
The Corning Laser Technologies systems are developed in close cooperation with the specialists at Corning, the world's leading innovators in specialty glass.

Superior Technology

Corning's material science and optic capabilities add unique advantages to the laser glass cutting process. The CLT 45G NX offers not only distinct advantages over conventional cutting processes, but also over other laser cutting systems.
Using ultra-short laser pulses, the material is cut by material disassociation rather than ablation. The result is a very low surface roughness, increased as-cut bend strength and faster throughput.
The Corning laser process enables cutting fully strengthened glass, un-strengthened glass, as well as other transparent glass and crystalline materials.

Key Benefits

- Cuts holes, radius form factors, complex geometries, vias, blind holes, slots and more
- Cuts functional multi-layer stacks
- Cuts glass from 0.4mm up to 6mm thickness
- Eliminates fluids and tooling required in traditional processing methods

Applications

Advanced multi purpose laser machining systems:
Processing Glass Substrates
- Display technologies
- Coated substrates
- Sandwich applications
- Cutting "thin" substrates
- Strengthened Glass
- Cover glasses of mobile devices
- Cover glasses of tablet PC's
- Camera protection glasses
- Drilling of Through Holes in Glass Substrates
- Mobile Devices (camera aperture, home button, loudspeaker, etc.)
- Electronic components
- Tablet PC's and computers

Micro Materials Processing
- Cutting and drilling of OLED, PI, Wafer, Ceramic, Plastic, etc.

Your Solution

Our application lab will work with you to provide a complete solution tailored to your specific requirements. An extensive base of state of the art tools includes a wide variety of laser sources and extensive optical, electrical, and mechanical metrology equipment for application development.

CLT 45G NX Technical Specifications

Mechanics	Machine base and vertical structure are made from solid granite blocks X-Y-split axis design (CNC-axis) Z-axis motorized (CNC-axis) Machine optimized for high precision processing at high speed Class 1 laser safety chamber	
Axes	X-axis range 920 - 1,200 mm Y-axis range 730 - 880 mm Z-axis range 50 mm max. traverse speed x/y-axis max. acceleration Positioning accuracy Repeatability	Drive: linear motor [1)] Drive: linear motor [1)] Drive: rotation motor [1)] up to 1,000 mm/s (pattern dependent) up to 10m/s [2] (pattern dependent) < 10 µm per 200 mm range [2)] < 2 µm [2)]
CNC-Control	TwinCat 3 CNC control for all machine functions (G-code)	
Operator Interface	Based on Microsoft Windows 10 with CLT HMI and touch screen	
Machine Vision	CLT vision system integrated in standard configuration	
Laser Source	Integration of up to three (3) different laser sources Setups for different wavelengths available	
Process Head	Fixed optics Galvanometer scanner Combination of both	
Options	Handling units for semi-automated or fully automated loading and unloading (optional)	
Electrical Supply	Rating: Power consumption : (peak/ average)	400 Volts, 3Ph+N+PE, 50/60 Hz (transformer available) 7.0 - 12.0 kVA / 6.3 - 10.8 kVA [3)]
Cooling	Rating (peak/ average): Consumption: :	9.3 - 14.6 kW/ 6.0 - 10.4 kW [3)] min. 16 l/min; max. 28 l/min [3)]
Compressed Air	Supply pressure: Consumption:	min. 6 bar / max. 8 bar [3)] typ. 500 Nl/min
Exhaust Air from Machine Enclosure	Volume: Connector size / type at machine:	min. 100 m^3/h exhaust air [3)] 1x connector at 90 mm nominal diameter (OD)
Exhaust Air from Vacuum Production	Volume: Connector size / type at machine:	up to 250 m^3/h exhaust air [3)] 1x connector at 90 mm nominal diameter (OD)
Machine Vacuum	No requirement at customer site. Will be provided by a side channel blower inside the equipment.	
Machine Size and Weight	Size: Width x Depth x Height: Weight:	1,750 x 2,450 x 2,400 mm [3)] 4,500 kg [3)]
Temperature	22 °C, Deviation +/- 2 °C , non condensing	

[1] Nominal travel range. Effective travel range may be reduced by use of multiple process heads and/or cameras.

[2] Environmental controlled room required.

[3] These values may vary, depending on the tool configuration, e.g. type of laser source.

Specifications are subject to change without notice.

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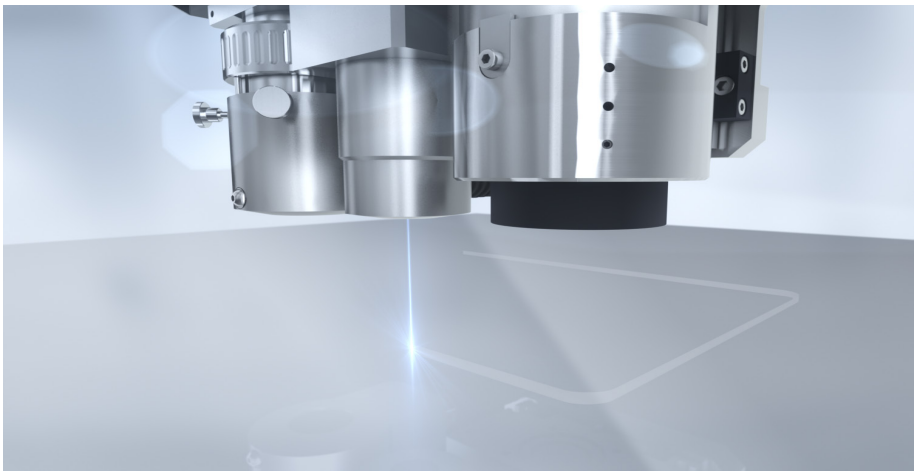


CLT 500X:

Versatile and flexible laser glass processing system

The CLT 500X is a versatile laser processing system for fully strengthened glass, Corning® Gorilla® glass, un-strengthened glass, as well as other transparent glass and crystalline materials. It is specifically designed for use in an industrial environment and is often used in R&D and small scale production.

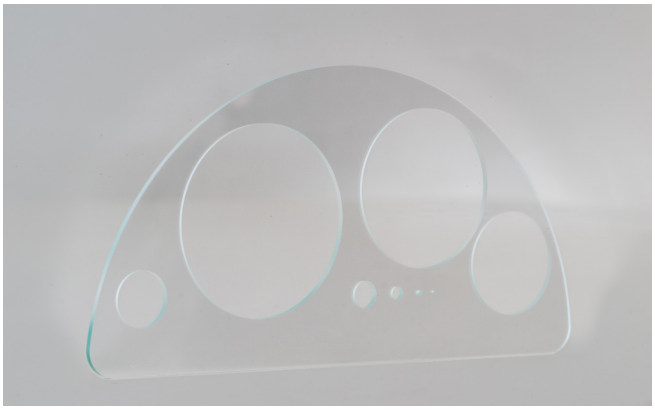
Using the Corning Laser Technologies process of ultra-short laser pulses, the CLT 500X cuts by material disassociation rather than ablation. This results in a very low surface roughness, and an increased as-cut edge strength of the glass, compared to ablative laser processes or conventional score and break methods.

For processing different types of material, the system can be equipped with multiple laser sources. This expands the scope of the system and makes it future-proof for coming applications.

The CLT 500X features a high-precision X/Y-table with dynamic linear moter drives. The table and the laser source are mounted on a machine base and vertical structure made from solid granite blocks. This ensures maximum stability even under high acceleration/deceleration. The result is a very high positioning accuracy of less than 5 µm (per 200 mm travel) and a repeatability of less than 2 µm.

Key Benefits

- nanoPerforation process to perforate the substrate
- Separation process to separate the substrate
- Free-form, net-shape or near net-shape cutting at up to 1m/s
- Cuts: curved, straight, perpendicular and angled lines as well as holes and slots
- Cuts glass from 0.4mm up to 6 mm in thickness



Applications

Versatile multi purpose and flexible laser machining system for:

Processing Glass Substrates

- Automotive interior glass
- Consumer electronics
- Architectural glass
- Display technologies
- Coated substrates
- Thin glass
- Strengthened and non-strengthened glass
- Drilling of through holes and vias
- Electronic components

This system is also extremely well suited for different kinds of Micro Materials Processing, such as:

Other Materials

- Cutting and drilling of OLED, PI, wafer, ceramic, plastic, and other brittle materials.

CLT 500X Technical Specifications

Mechanics	X/Y-table machine system with highly dynamic linear motor drives Machine base and vertical structure are made from solid granite blocks Class 1 laser safety chamber Pneumatically operated access door	
Axes	X-axis travel 250 - 500 mm Y-axis travel 300 - 700 mm Z-axis travel 150 mm Max. traverse speed x/y-axis Max. acceleration Positioning accuracy Repeatability	Drive: linear motor [1] Drive: linear motor [1] Drive: rotation motor [1] up to 1,000 mm/sec (contour-dependent) up to 10 m/sec [2] (contour-dependent) < 10 µm per 200 mm travel [2] < 2 µm [2]
CNC-Control	TwinCat 3 CNC control for all machine functions (G-code)	
Operator Surface	Based on Microsoft Windows 10 with CLT HMI	
Loading	Manual loading of substrates onto worktable	
Machine Vision	Integrated in standard configuration for fiducially recognition	
Options	Drop out laser process for circular inner contours Ablative drilling process Fully automated carrier return Full automation by use of transfer carrier	
Electrical Supply	Rating: Power consumption: (peak/ average)	400 Volts, 3Ph+N+PE, 50/60 Hz (transformer available) 4.0 - 12.0 kVA / 3.6 - 10.8 kVA [3]
Cooling	Rating (peak/ average): Consumption:	3.3 - 14.6 kW / 3.0 - 10.4 kW [3] min. 11 l/min; max. 26 l/min [3]
Compressed Air	Supply pressure: Consumption:	min. 6 bar / max. 8 bar [3] typ. 500 Nl/min
Exhaust Air from Machine Enclosure	Volume:	min. 50 m^3/h exhaust air [3]
Exhaust Air from Vacuum Production	Volume:	up to 250 m^3/h exhaust air [3]
Machine Vacuum	No requirement at customer site. Will be provided by a side channel blower inside the equipment.	
Machine Size and Weight	Size: Width x Depth x Height: Weight:	1,650 x 2,200 x 2,300 mm [3] approx. 3,800 kg [3]
Temperature	22 °C, Deviation +/- 2 °C , non condensing	

[1] Nominal travel range. Effective travel range may be reduced by use of multiple process heads and/or cameras.

[2] Environmental controlled room required.

[3] These values may vary, depending on the tool configuration, e.g. type of laser source.

Specifications are subject to change without notice.

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