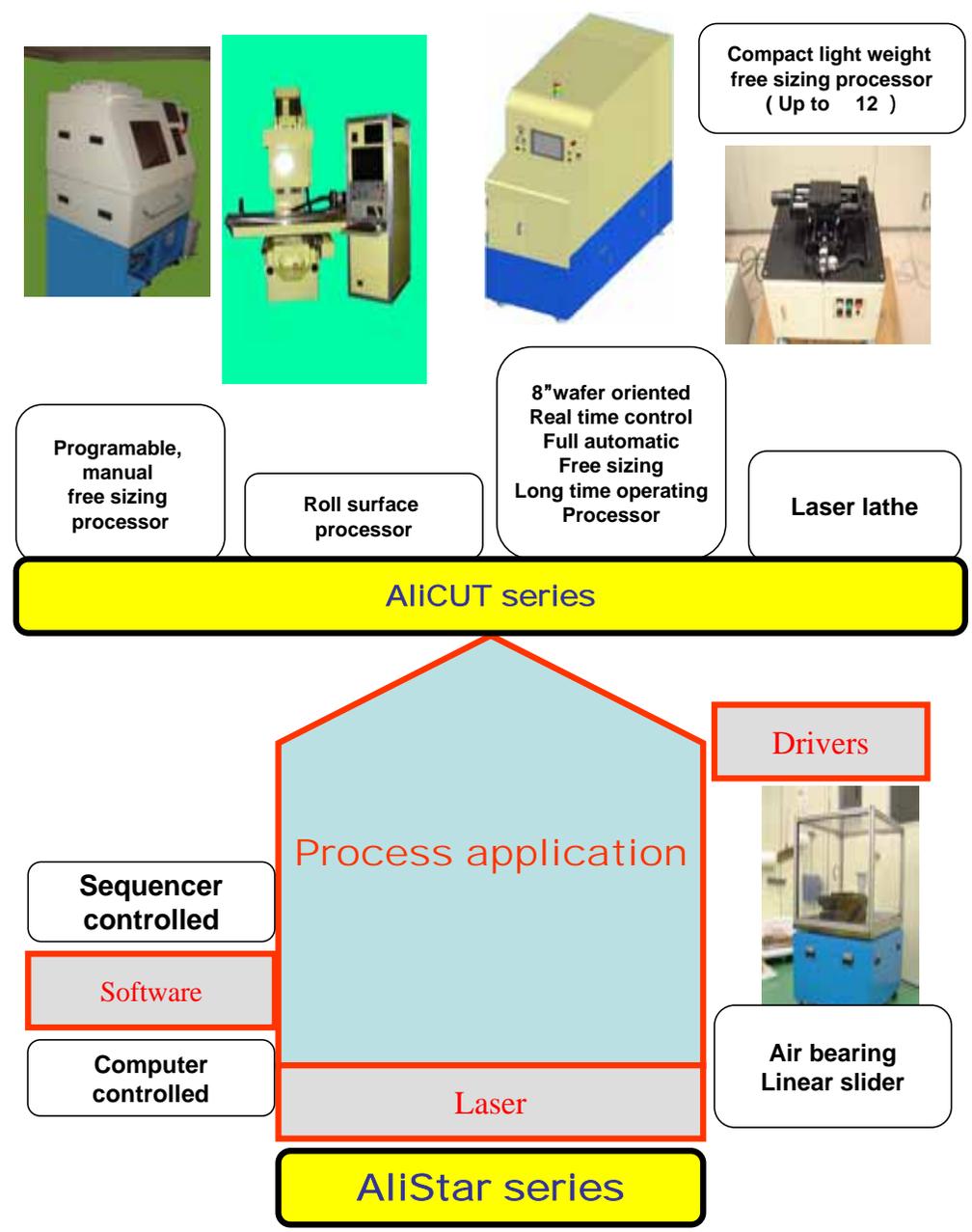
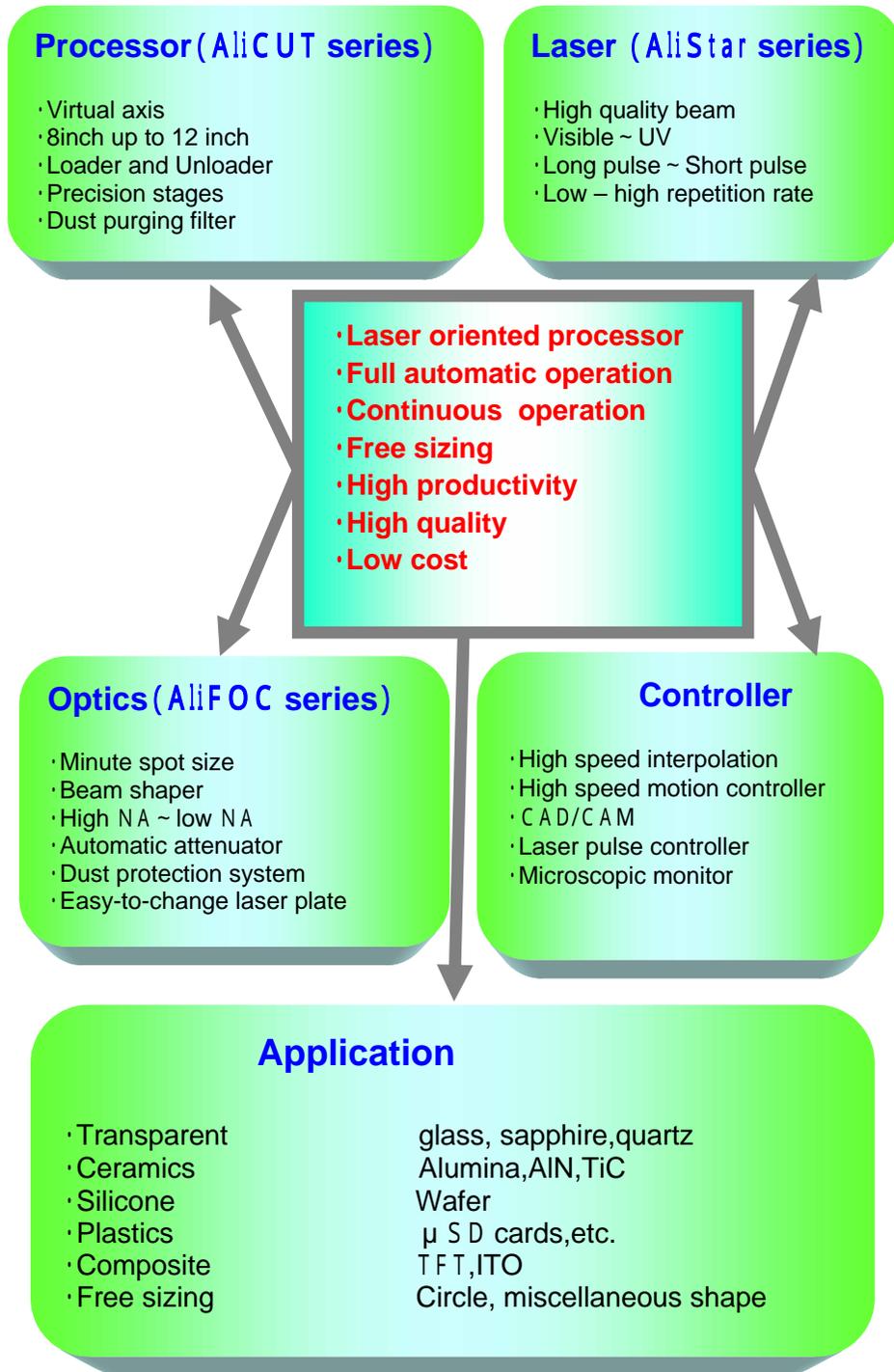


# Laser Precision Processor

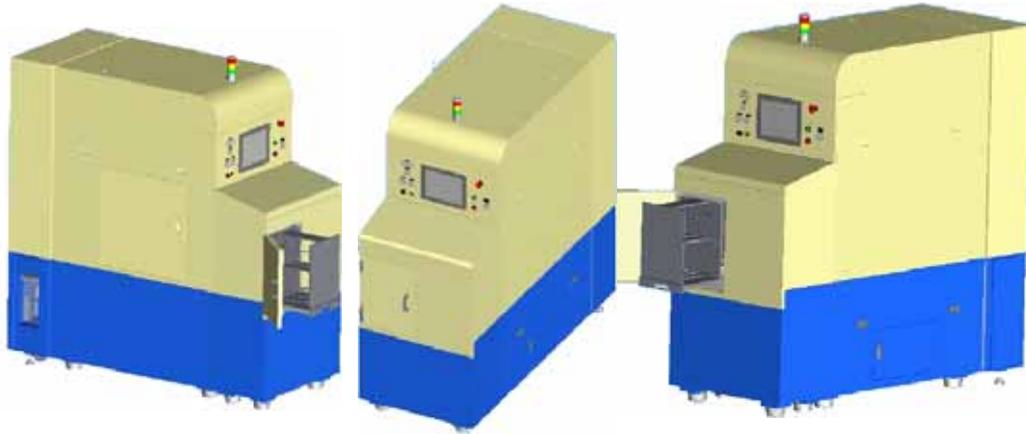
Other relating systems are also available



Allied Lasers, Inc. prepares for technologies from laser to laser related system as well as laser applications.

# High precision compact full automatic dicer

Semiconductor, LEDs, glasses, ceramics, composites, plastics, etc. are processed with high precision without external force under dry condition.



Size: 980mmW x 1500mmB x 2000mmH

Weight: 820kg

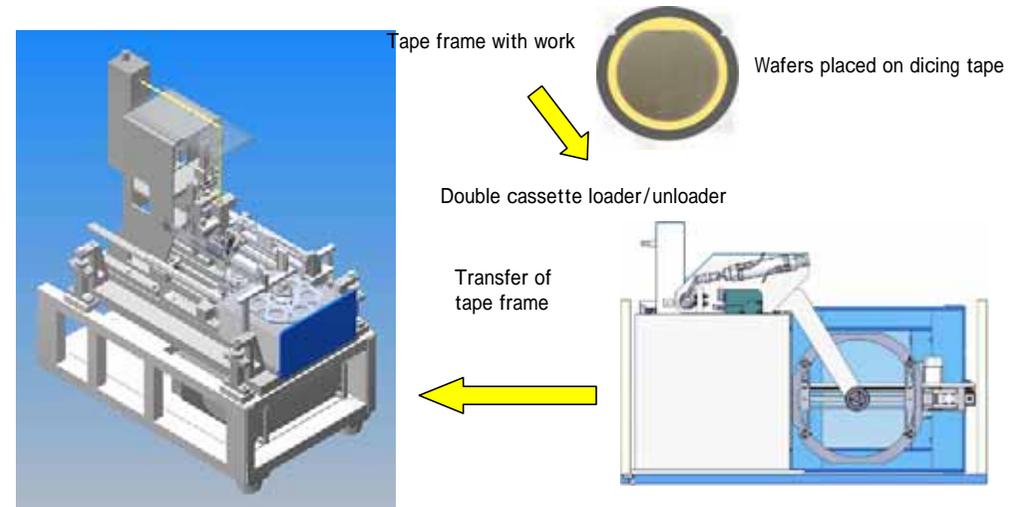
Precise laser processing system is provided by Allied Lasers, Inc. who is developing lasers through application system for many years. This processing system is a full automatic ALiCUT-D series product succeeded by manual/semiautomatic ALiCUT-M series, which is now being used for ALiNC Jobshop. An 8" system is normally used for LED singulation of wafer with the size from 2" to 5" wafer, which is also used for cutting ceramic chips, composite glass plate placed on the dicing tape set in a 5" or 8" wafer carrier cassette.

What you have to do is just loading carrier cassette with tape frames in, and put on Start button. You will see finished wafer works in the carrier cassette. Double cassette carrier can be mounted in the loader and unloader.

Various kind of wafer, even broken wafer are available with appropriate recognition software. Transparent works can be processed from front surface as well as rear surface by our pattern recognition scheme.

- Features
- Available for 8" wafer
  - No rotating stage with pattern recognition alignment system
  - Free sizing
  - Fully automatic system
  - Processing transparent works from front and rear surfaces
  - No chiller
  - Double 25 carrier with ring frames
  - Long time laser power stability
  - Long time dust protecting system
  - Precision chip singulation under 100 μm
  - Filter for toxic gases released during processing
- (Option)
- CAD-CAM available
  - Synchronization with laser pulses

# Cassette loader/unloader available Double cassette with 25 pieces 8" wafers is loaded.

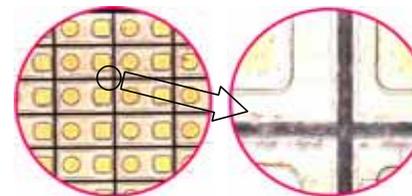


After placing two cassettes carrying wafers under 8" are installed into the loader/unloader, fully automatic operation starts by pushing start button. Processes consists of tape frame transfer, shape recognition, pattern recognition, alignment, laser machining, transfer of tape frame to cassette. Each process is carried out based on the pre-decided procedures. Tape frame with no wafer on it is skipped automatically by wafer monitoring system. Broken wafers can also be processed by automatic pattern recognition method. Specially designed thin layer coated plate is used between the dicing tape and work table for avoiding direct damage by laser irradiation. Repeatedly arranged patterns are recognized by special window system, and before and after processing a wafer, a scribe line can be monitored and judged by human eyes, when needed. Thanks to the virtual rotating axis which needs no real -axis surely leads to the secured alignment all the time.

# Single μm curf /full cut processing available

Single micron m width is realized in GaN LED singulation process with curf width < 6 μm, depth > 30 μm and full cutting of GaAs, Si is also available. Be sure that the optimum processing conditions are previously provided by us, although every user can try arbitrary conditions.

# Dicing of sapphire based GaN LED



Scribing depth ~ 30 μm Curf width < 6 μm

Transparent works such as sapphire LED wafer can be processed from both front and rear surface by the pattern recognition which can be carried out from the other side of the patterned surface through transparent body.

Process without releasing dust is also possible.

	<p>レーザー光 ビームも散乱光も危険です。 見たり触れたりしないこと クラスII レーザー製品</p>	<ul style="list-style-type: none"> <li>· Safety action is applied to this product based on JIS-C6802. Users should follow the safety regulations.</li> <li>· Specification is subject to change for improvement.</li> </ul>
<p>Allied Lasers, Inc. Keihanna Laboratory 3F, 1-7, Hikari-dai, Seika-cho, Soraku-gun, Kyoto, 619-0237 Japan Tel./Fax. 0774-98-33004</p>		<p>ALiCUT series processors are products activated by ALiStar series laser.</p>

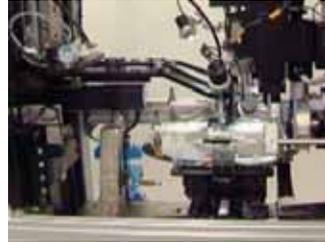
# Processor in operation

Processor is composed of laser, beam transport unit, beam focusing unit, precision stage, and automatic processing software.

Laser



Wafer transfer



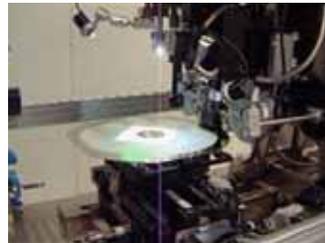
Front panel and main frame with loader/unloader  
(Panels are removed to look into.)



Pattern recognition step



Control panel



Laser : AliStar-G for standard installation. AliStar-DU (266nm) is available.

Beam transport unit: AliTRANS-G for standard installation.

Focusing unit : AliFOC-G for standard installation.

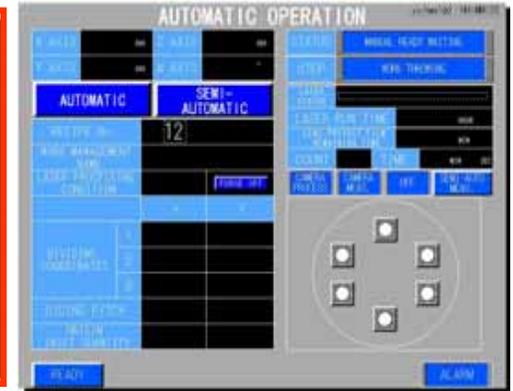
Touch panel: Japanese and English version available.

# Full automatic controller

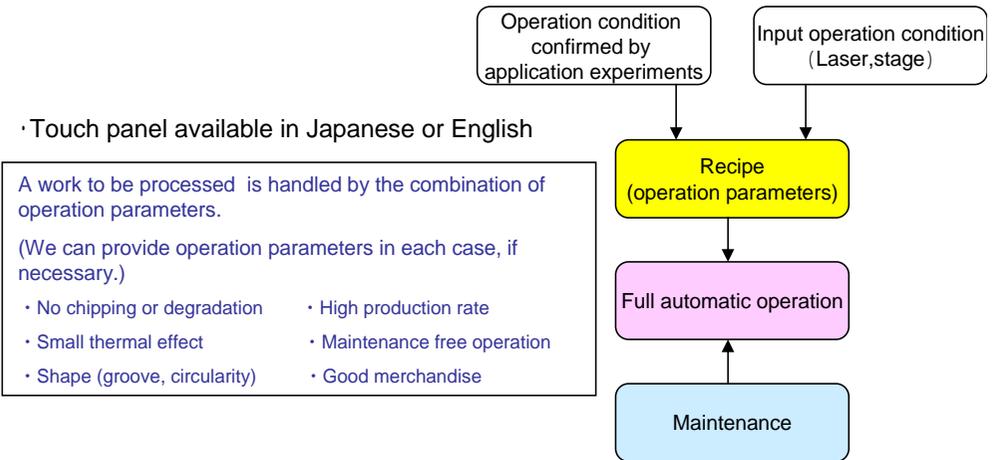
What you have to do is just to push start button.



Manual operation



Automatic operation



Field	Operation parameter		
Laser	Average power	Polarization	Pulse shape
	Pulse width	Pulse repetition rate	Wavelength
Optics	Focusing spot radius	Masking	Beam shaping
	Polarization change	Pulse timing control	
Stage	Scanning speed	Position accuracy	Focusing depth
	Interpolation	Surface roughness	
Environment	Air	Vacuum	Purging
	Special gas	Liquid	Plasma control

## Specification

Item	Performance	Remarks
Laser	AliStar - G	AliStar-DU(266nm) available
Beam transport system	AliTRANS-G	AliTRANS-DU available
Focusing system	AliFOC-G	AliFOC-DU available
Compressed air	> 3 atm	
Current	20A	
Voltage	200V	100V available

Consumables	Performance	Remarks
Lens protector	Protection of lenses	>1000hrs
Dust filter	Water filter	>50hrs
Laser diode	Optical pumping	>1year
Optical crystal	Wavelength converter	>1year
Laser optics	Mirrors, etc.	>1year (maintenance)

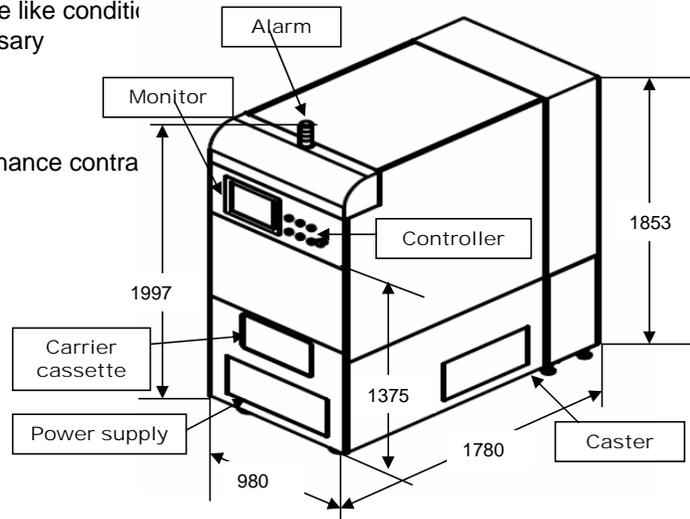
## Installation

### Installation

- Floor load : 0.5ton/m<sup>2</sup>
- Circumstance : office like conditi
- License : Not necessary

### Maintenance

- Guarantee : 1year
- Whole year maintenance contra



## Application to bio-chips, etc.

Most appropriate for precision processing of  $\mu$ -TAS

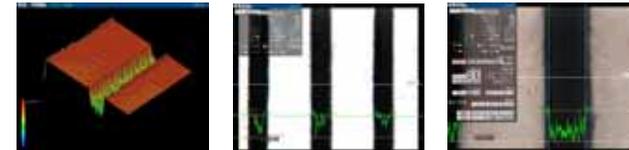
### Materials

- LED scribing & full cutting
- Transparent plates (glass, etc.)
- Crystals
- Ceramics (electronic devices)
- Free sizing ( $\mu$  SD card, etc)

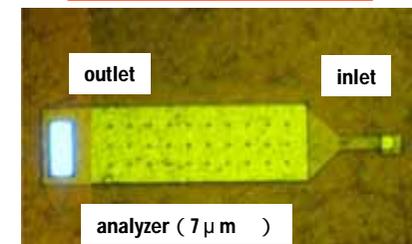
### Applications

- Bio-reactor chips
- $\mu$ -TAS
- PCR chips
- Filter chips
- Cell culture chips

### Bio-reactor chips



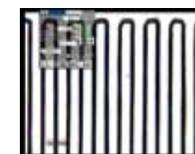
### $\mu$ -TAS chips



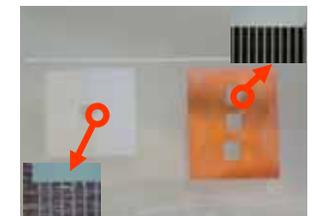
### Filter chip



### Analyzer chip



### Cell culture chip



- CAD-CAM system and laser pulse synchronization method are applied to free sizing process.
- Process-wise parameters are required which are provide by us, or user can find them after some experiment processing tests.