Application:
Removing and penetrating coatings on glass substrates according to the trials, done by MDI on provided test substrates.
Important components:
Laser 12ps UV(355nm) Laser from EDGEWAVE model SXp50-3-GF
o diode pumped and frequency trippled ps-InnoSlab
o wavelength: 355nm
o pulse repetition rate: from single shot to 2MHz, external
o triggerable
o timing jitter: < 20ns
o pulse energy from single shot to 100kHz: 120µJ
o pulse length: 12ps
o average power at 100kHz: 12W
o beam quality: M2 <= 1.3
o beam diameter: 3mm
o pulse energy stability: 3%rms
Water-air-chiller SMC Typ HRS012-AF-20
Scanner Scanlab hurrySCAN III-14
Spindle-positioning system X/Y/Z: Rexroth Bosch, GETOtech

o X-axis +/-50µm
o Y-axis +/-50µm
o Z-axis <+/-50µm

Remark: X and Y axis will be equipped with external linear scales from HEIDENHAIN to increase the
accuracy. The single components will be much more accurate. But in combination with camera alignment, scanner and laser the accuracy will be +/-50µm.

o Z-level-Sensor with laser triangulation, resolution <10µm
o Automated Camera Alignment system with full license to create new applications
o Vacuum table to fix and flatten the substrates (vacuum will be delivered by Beneq)
o Robot cell (Kuka) for automated loading/unloading for 7 cassettes
o Hose to extract ablation particles (for suction Beneq´s inhouse system will be used)

Robot KUKA KR6 R900 sixx
Control Siemens
Pneumatic SMC
Functions:

o Dxf-Converter to convert dxf-files into machine code (only lines and arcs are accepted)
o Shapes can be anyone, as long as they exist of lines and arcs.
o Tiling-function: If a shape exceeds the scanfield size (approx. 50x50mm), the shape will be divided into smaller tiles. Transitions might be visible.
o Variations in glass thickness will be adapted by the Z-level Sensor.
o The orientation of the substrate (angle and position) will be corrected by the alignment camera system according to the alignment crosses/fiducials
o The size of the camera window for alignment is approx. 7x5mm. The alignment crosses must be inside of this window after positioning by the robot.
o The machine can also be used without robot. Loading/unloading manually through the front door.
o The laser cell will be equipped with one laser protection window to observe the process.
o The robot cell will be equipped with additional windows for better visibility and observation.
o Between laser and robot cell is an automatic door to ensure laser safety.

More information:

o Machine is compatible to cleanroom ISO 6
o Size of machine LxWxH 2.800 x 1.800 x 2.000 mm3

