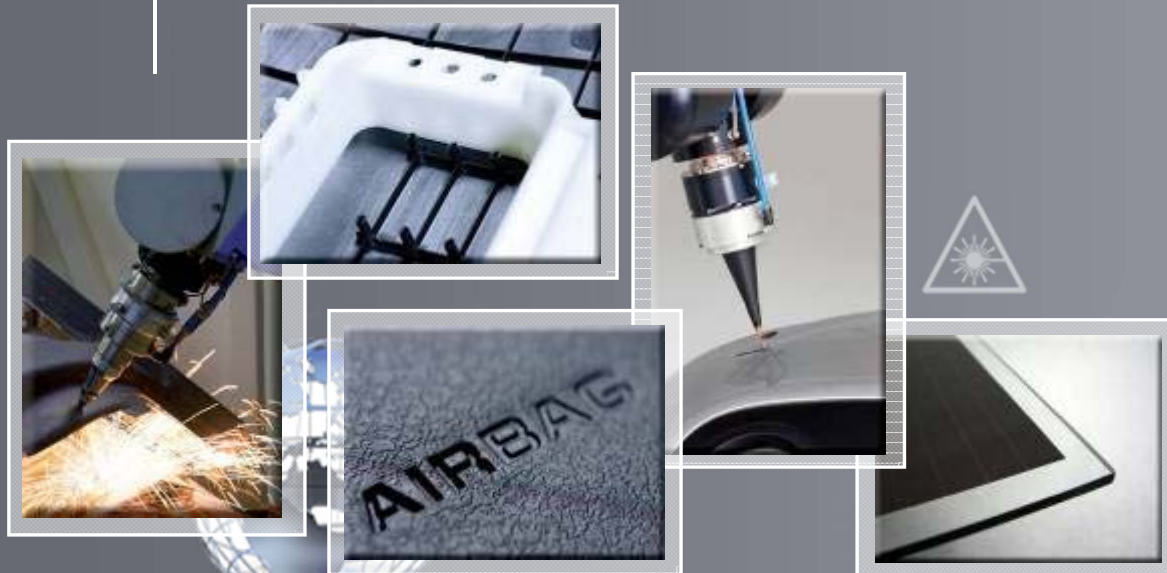
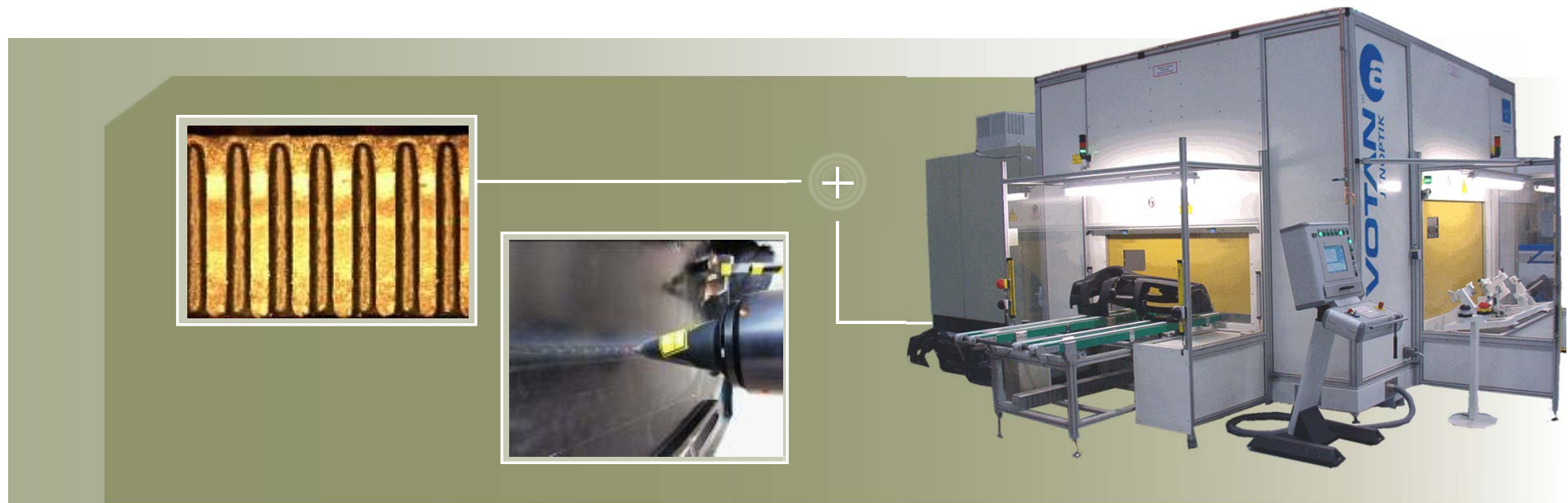


Sharing Excellence in Laser Processing Systems





JENOPTIK-VOTAN[®] A - Laser processing systems



Speaker

1. Operating principle of VOTAN® A
 - Machine overview
 - Materials
 - Workflow
 - Operating principle
 - Processing results
 - Control process
2. Customer benefits
3. Machine family VOTAN® A
 - VOTAN® A Compact PP
 - VOTAN® A Compact
 - VOTAN® A Classic
 - Options
4. References
5. Services / Customer Application Center



JENOPTIK VOTAN® A – Machine overview



JENOPTIK-VOTAN® A (Airbag) – Laser processing system for producing lines of preweakening in instrument panels for integrated airbag covers.



General view JENOPTIK-VOTAN® A



Possible materials and material combinations:



Soft instrument panels

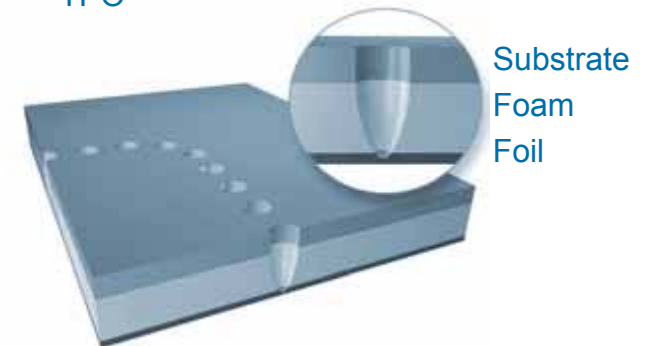
- PP-LGF / PU foam / PVC skin
- PC-ABC / PU foam / TPO foil
- PP-LGF / TPO foam foil
- PC-ABS / PVC foam foil
- PP-LGF / spacer fabric / PU foil
- flexible TPE / PU foam / TPO foil (e.g. for knee bags)

Additional cover versions

- kneebag
- thorax

Hard instrument panels

- PP
- PP-GF
- PP flax / textile decor
- PP / foil (TPO, PVC)
- TPO



Leather perforation? Please see separate presentation!

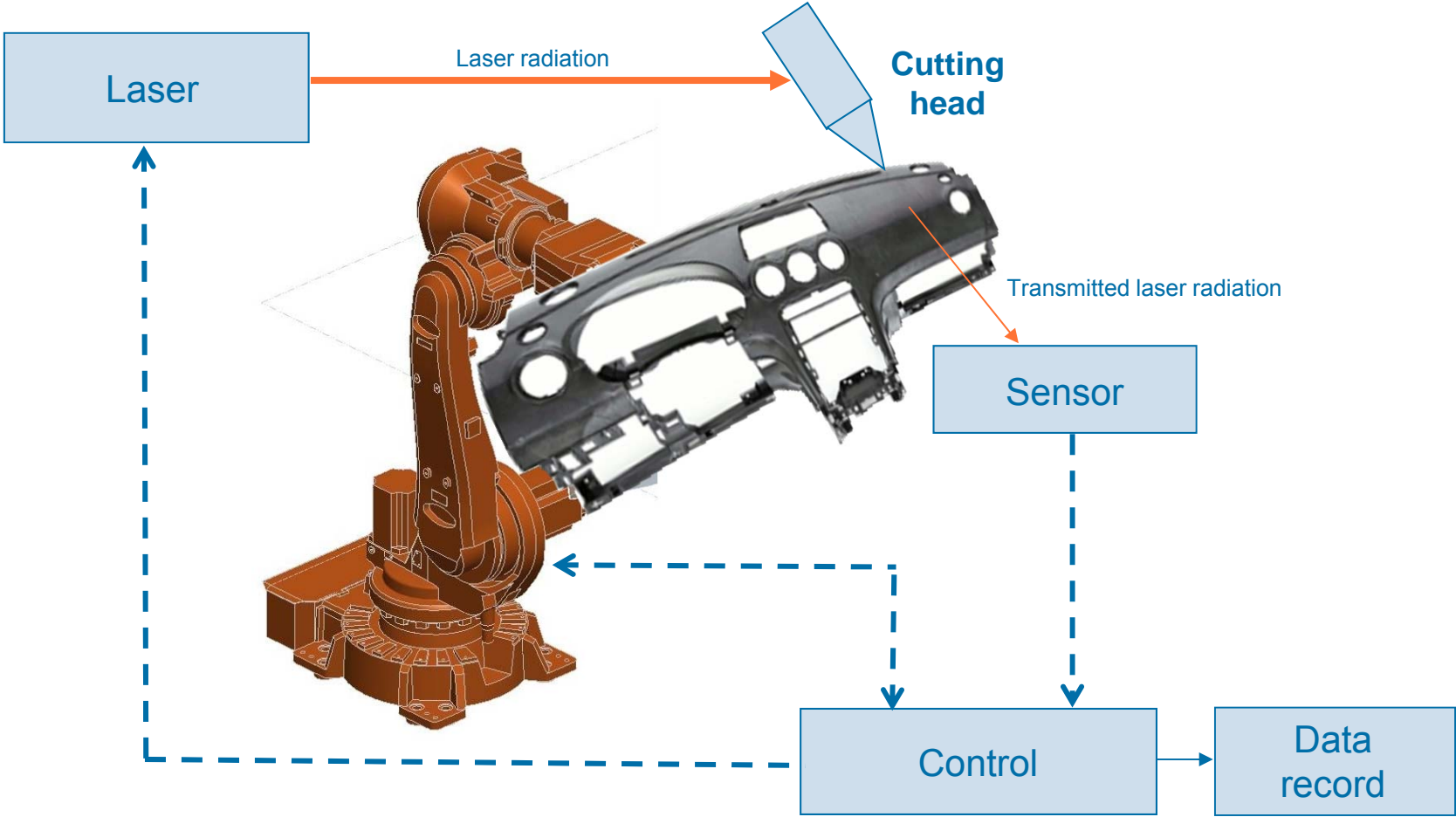
Video





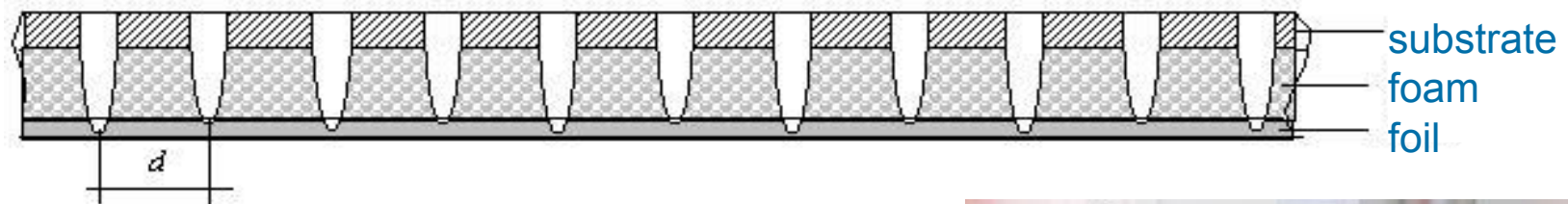
- Loading and clamping of the instrument panel into a robot fixture by the operator
- Scanning of the barcode by the operator
- Starting the scoring process by pressing the start button at the control unit
- Automatic closing of the hatch
- Robot moves the instrument panel past the laser scoring head along the programmed contour
- Automatic sensor control before starting to laser process the instrument panel
- Monitoring of the process parameters during laser process
- Machine performs internal analysis of the scoring result and issues an okay or not okay processing
- Robot moves the instrument panel to the hatch
- Automatic opening of the hatch
- Unloading of the processed instrument panel by the operator
- Loading of the next unprocessed instrument panel

JENOPTIK VOTAN® A – Operating principle



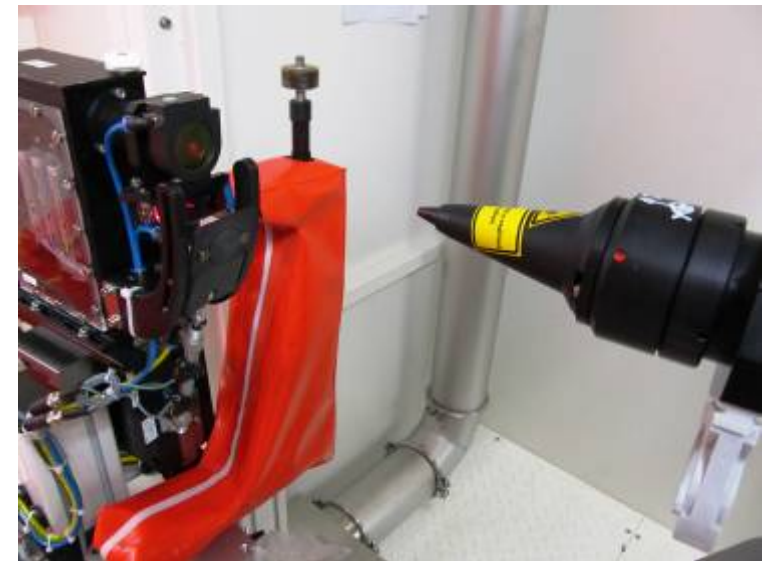
The line of preweakening consists of a succession of individual holes.

Example:

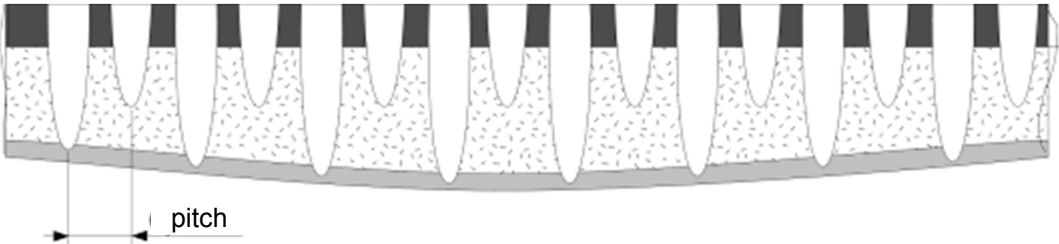


Advantages:

- Multilayer materials are processed in a single step
- Controlled process, sensor-controlled inspection
- Many different versions of cutting design
- 100% monitoring of all points of processing
- Archiving of all relevant process data



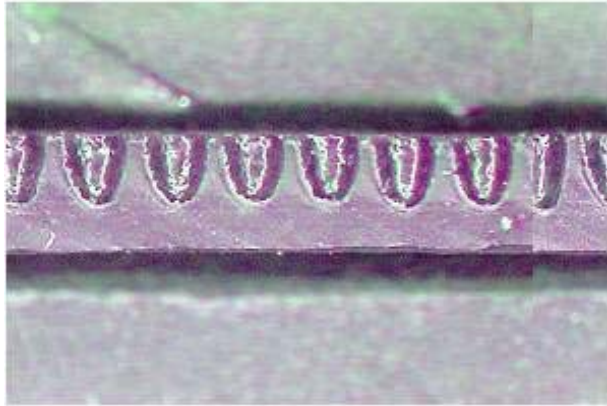
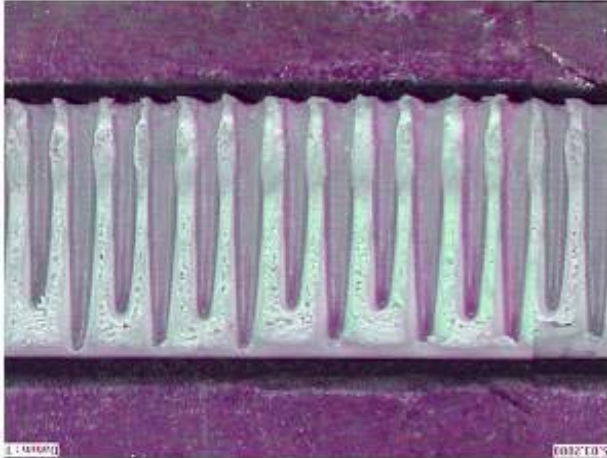
Application examples - single and multi layer panels



Microperforation with blind holes of constant penetration depth.



Defined depth cutting with intermediate pulsing.





Microperforation (MP)

- ✓ for low IR transparent materials (e.g. PP, PVC, TPU)

Shut off laser power at sensor threshold signal.

- RWT depending on material
- typical value about 100 μm

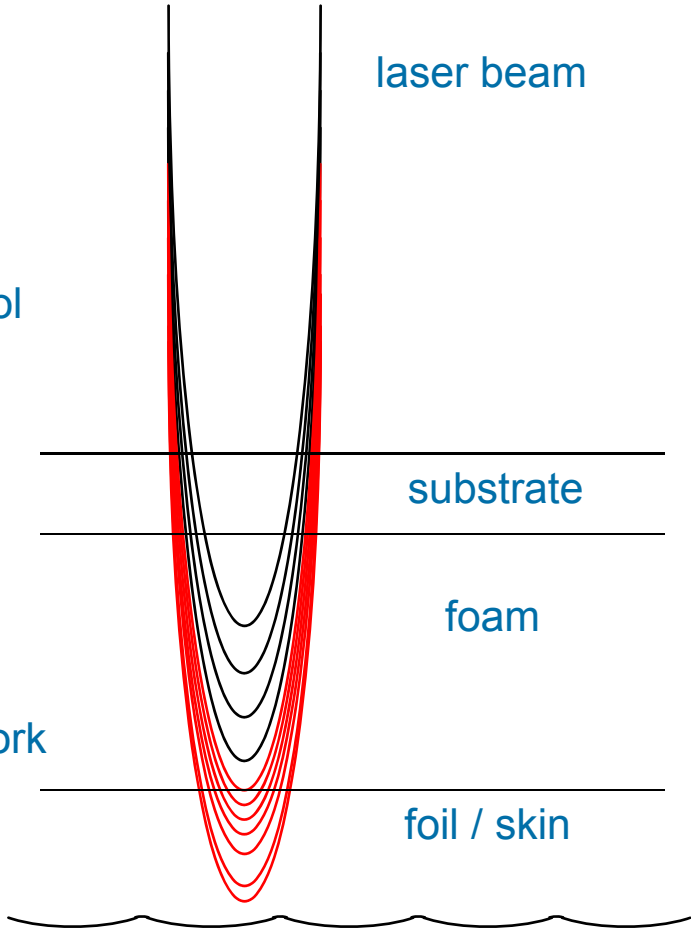
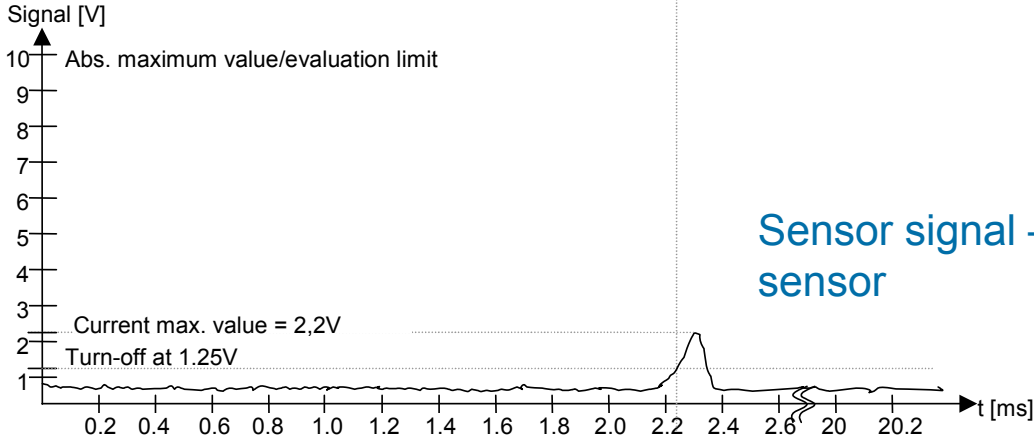
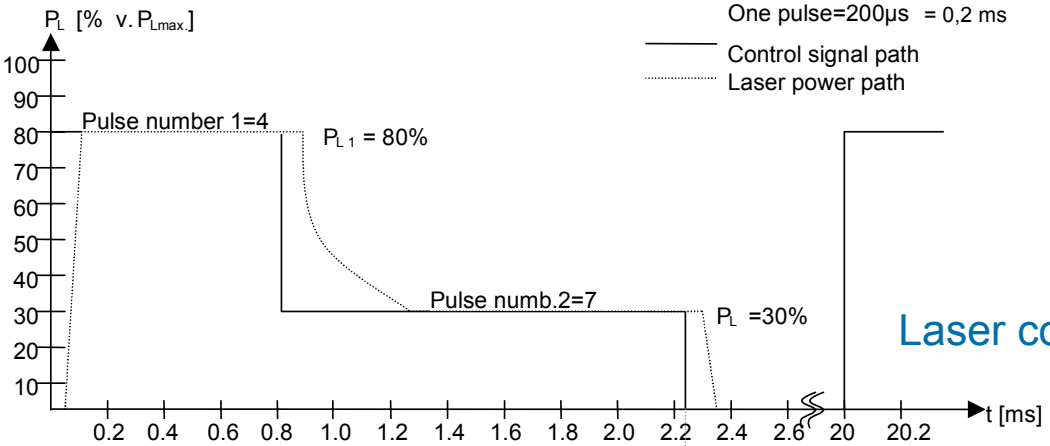
Residual wall thickness (RWT)

- ✓ for high IR transparent materials (e.g. TPO)

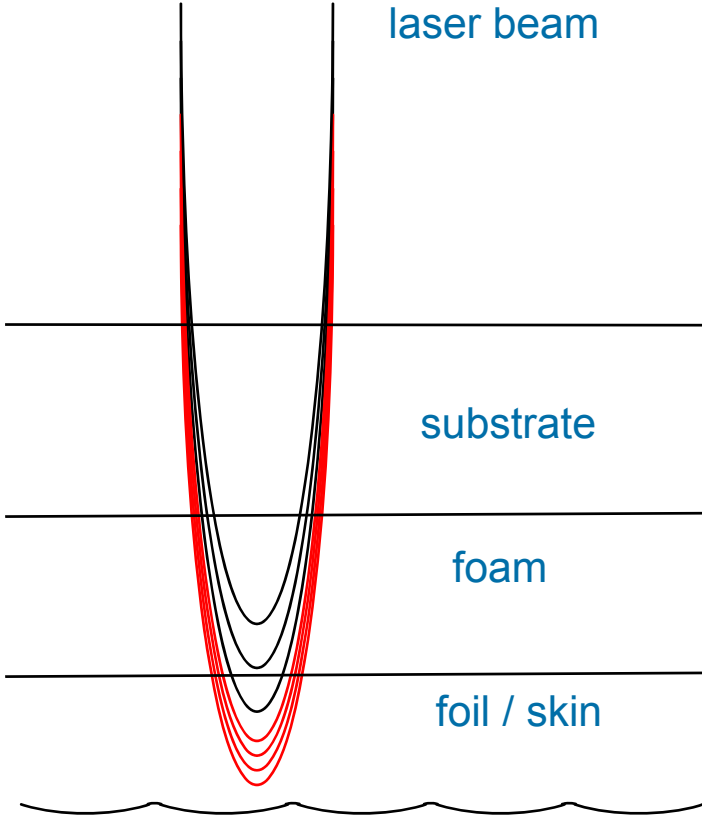
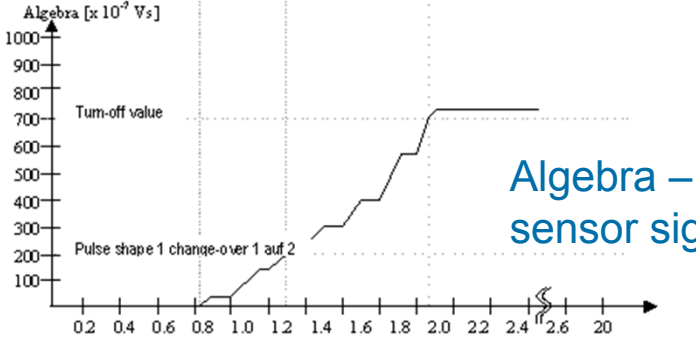
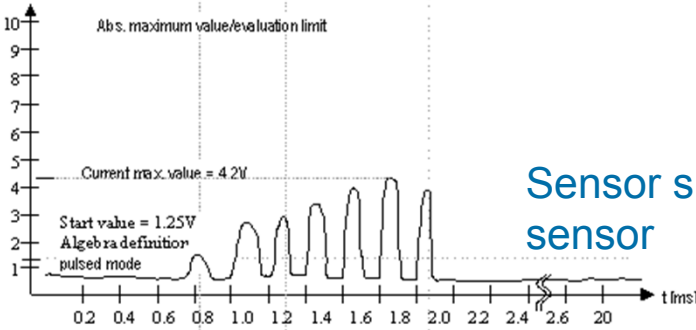
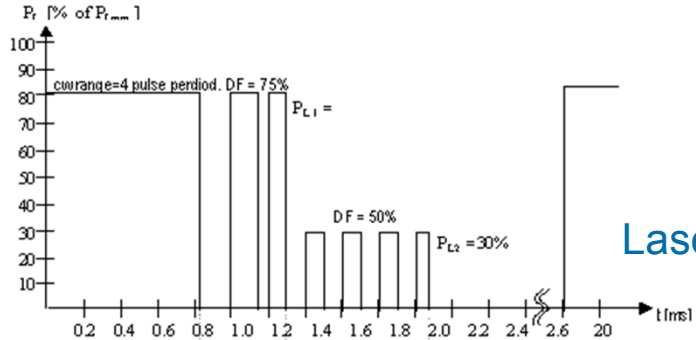
Integration of sensor signals up to a threshold value, than shut off laser power.

- adjustable RWT up to 500 μm

JENOPTIK VOTAN® A – Control process MP



JENOPTIK VOTAN® A – Control process RWT



Benefits for customer

- Integration of the flap function into the instrument panel
- 100% safety by patented sensor-controlled process
- 100% traceability through documentation of the process parameters
- Low cost per unit by processing in a single step
- Low running costs due to no wear of the laser tool
- High investment security through extremely wide material and component range at low changeover costs

JENOPTIK VOTAN® A family

VOTAN® A Compact PP

VOTAN® A Compact

VOTAN® A Classic

JENOPTIK-VOTAN® A Compact PP – system for producing of lines of pre-weakening in single-layer instrument panels for integrated airbag covers.

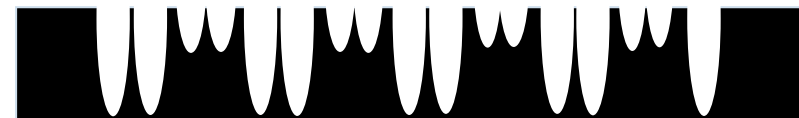
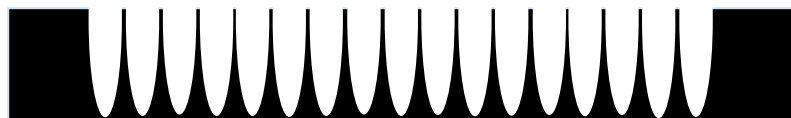
- Processing cell with hatch
- Laser 400W with cooling
- 6-axis robot IRB 4400
- Optical beam path elements
- Working sensor
- Loading and removal station
- PLC, MC control and PC
- Manual barcode scanner
- Operator panel
- Exhaust unit Katasorb® A 1.5



General view JENOPTIK-VOTAN® A Compact PP

Notice:

No reference sensor in the machine!

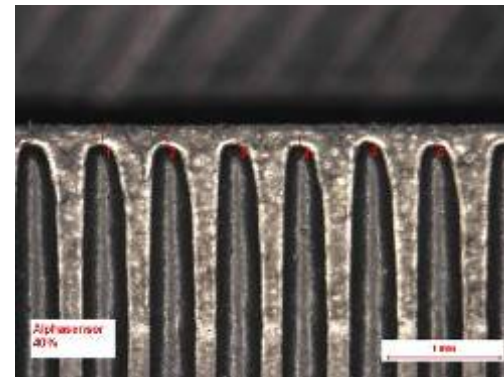
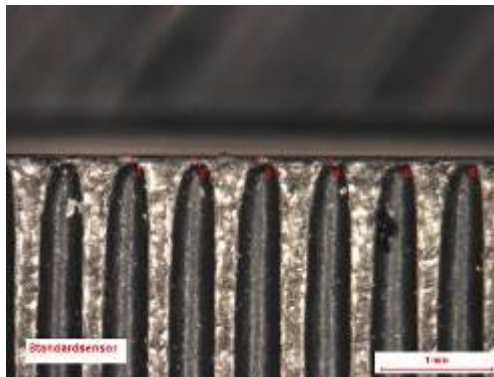


100% control by working sensor

50% control by working sensor

- Software package technology MP6.0 MC or RWT6.0 MC
 - to be able to change parameter setup
- Online focus correction (OFC)
 - will be recommended, if geometrical variation is bigger than +/- 0.6 mm
- MCT sensor
 - increases the residual wall thickness, decreases sink risk

Standard sensor



MCT sensor

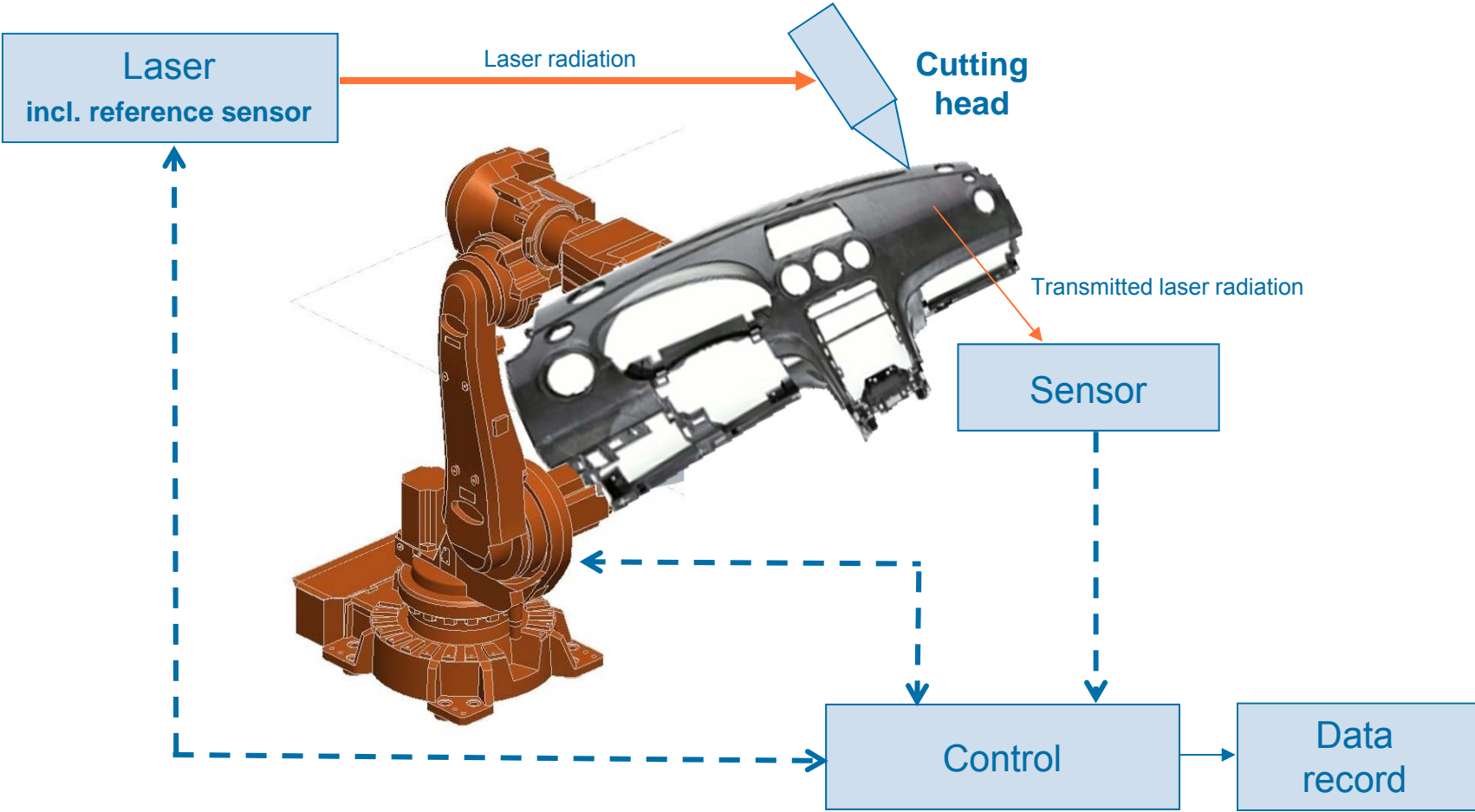
JENOPTIK-VOTAN® A Compact – system for producing of lines of pre-weakening in instrument panels for integrated airbag covers.

- Processing cell with hatch
- Laser 1500 W with cooling
- Laser integrated reference sensor
- 6-axis robot IRB 4400
- Optical beam path elements
- Working sensor
- Loading and removal station
- PLC, MC control and PC
- Manual barcode scanner
- Operator panel
- Exhaust unit Katasorb® A 1.5



General view JENOPTIK-VOTAN® A Compact

JENOPTIK VOTAN® A – Operating principle



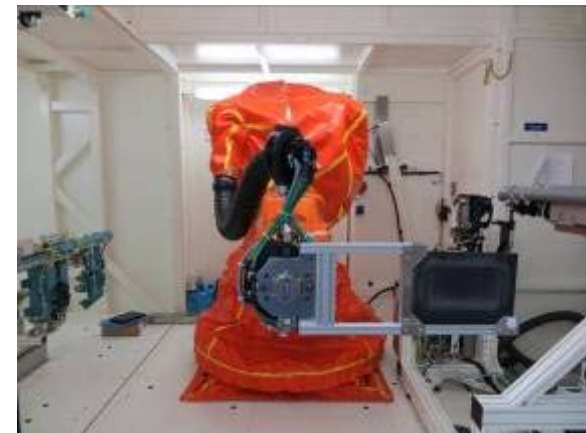
JENOPTIK VOTAN® A Compact – Additional options



- Extended laser power 2000 W
 - especially for thick foams or glass fiber materials
- Automatic barcode reader
- Barcode printer incl. integration software
- Katasorb® Z organic
 - eliminates solid contaminants in a mechanical prefilter; gases are treated by catalytic oxidation
- Katasorb® Z acid – for PVC materials
- HCl protection
 - robot protection, anti acid paint inside, stainless steel exhaust pipes
- Robot fixture



Katasorb® Z organic



HCl protected robot and cabin

JENOPTIK VOTAN® A Compact – Additional options



- Automatic device change system
 - Automated changeover between up to 6 robotic devices possible; chaos operation realizable as well
 - High dependability and time saving since no manual device change necessary
 - Devices are deposited on a multilevel round table with laser proof separation from the processing room



Additional fixture



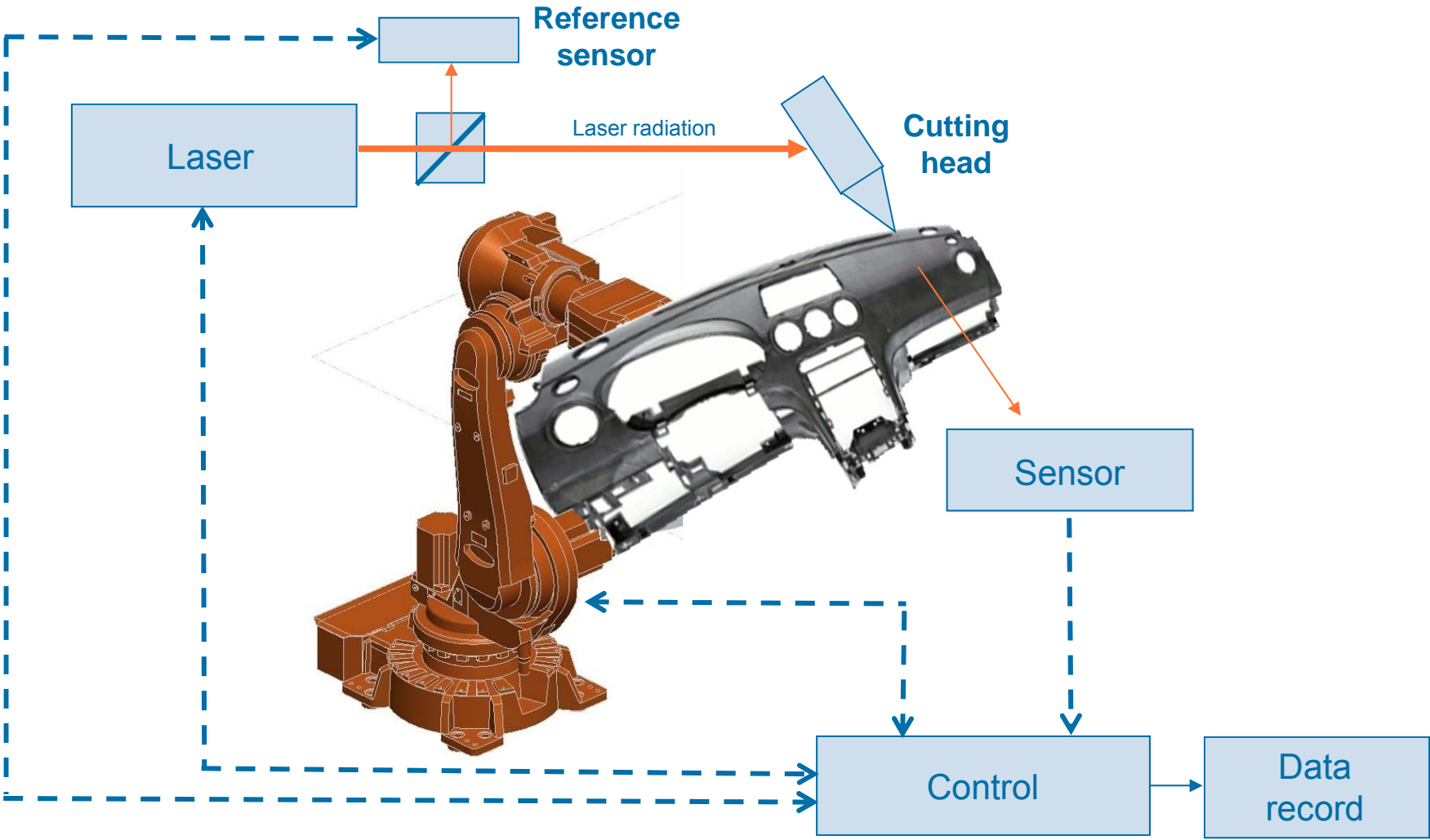
Optionally device change box

JENOPTIK-VOTAN® A Classic – system for producing of lines of pre-weakening in instrument panels for integrated airbag covers.

- Processing cell with hatch
- Laser 1500 W with cooling
- 6-axis robot IRB 4400
- Optical beam path elements
- Work sensor and reference sensor
- Loading and removal station
- PLC, MC control and PC
- Manual barcode scanner
- Operator panel
- Exhaust unit Katasorb® A 1.5



General view JENOPTIK-VOTAN® A Classic



Technological options:

- Additional 100W laser for decor processing
- Mobile sensor unit to handle also edge trim cutting and vacuum perforation jobs
- Slitting operation with additional shutter in front of the sensor and exhaust nozzle



Shutter and nozzle



Mobile sensor unit

- additional linear axis to move the sensor unit outside of the working area

Machine options:

- Device rack inside the machine
 - » for multiple fixtures
- Turn table for parallel loading / unloading



Turn table



Device rack

JENOPTIK VOTAN® A – Additional options



Customized solutions:

- Extended conveyor belts
- Multiple hatch solution
- Gallery for providing cabinets



Bigger hatch



Solution with output conveyor

JENOPTIK VOTAN® A

Stand-alone Options for quality monitoring of series production



Impact tester



- Parameter development for new material systems
- Sampling in series production

Microscope measurement place incl. PC and software



- Measurement of laser scored material components
- Series based documentation
- Report for multiple samples from the airbag section on a single sheet



Comparison between different JENOPTIK VOTAN® A laser processing systems

JENOPTIK-VOTAN® A Compact PP

- Laser power 400 W
- Micro-perforation software for Microcontroller
- Optimized system for processing PP material only

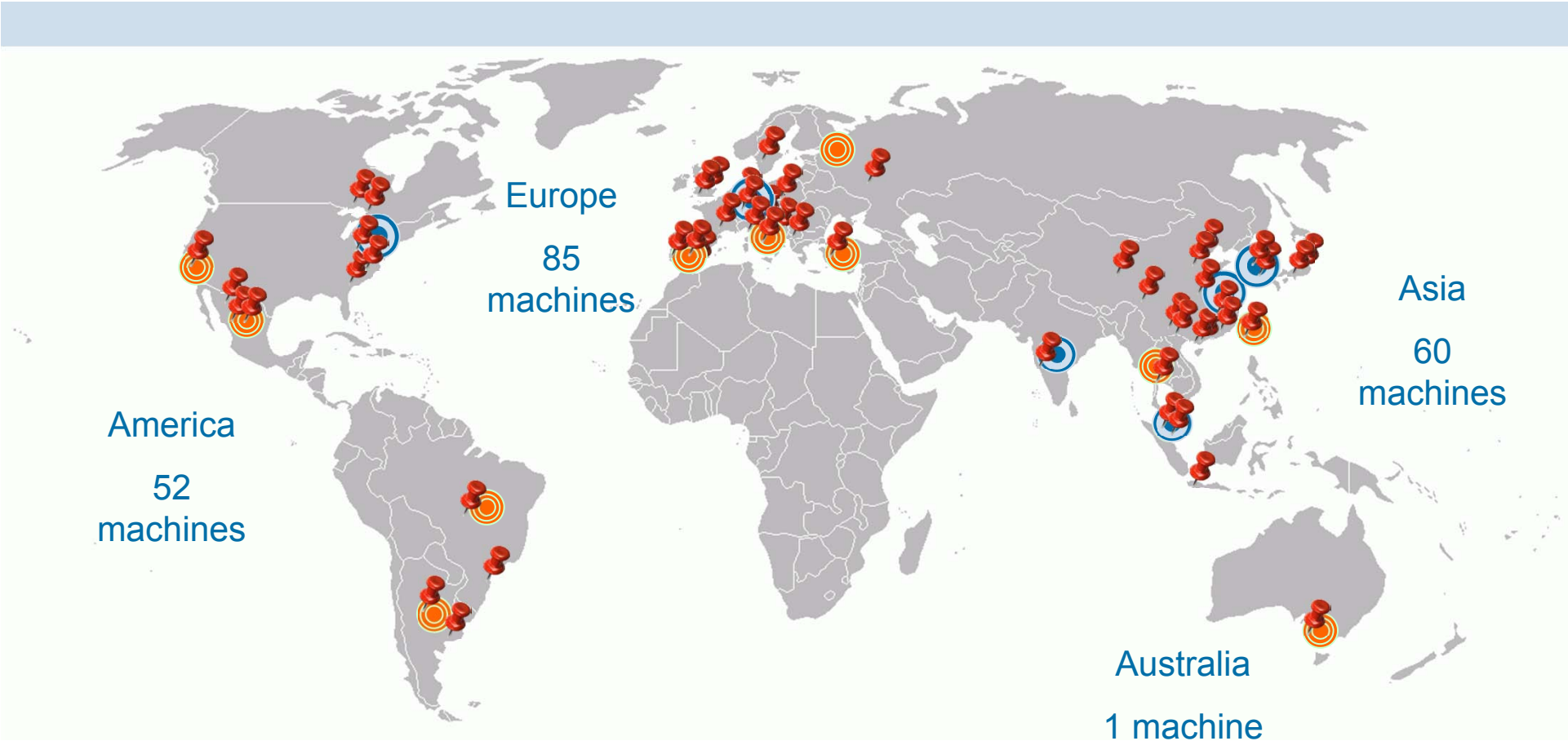
JENOPTIK-VOTAN® A Compact

- Laser power 1500 W
- Micro-perforation & RWT software for Microcontroller
- Processing of PVC material possible
- Different kind of material can be processed

JENOPTIK-VOTAN® A Classic

- Laser power 1500 W
- Micro-perforation & RWT software for Microcontroller
- Processing of PVC material possible
- Different kind of material can be processed
- Automatically fixture change
- Different loading and unloading options available

References VOTAN® A and service points JENOPTIK



Existing Customers (> 200 machines)

Service points of JOAT

Representations of JOAT

„Join us for a test drive to verify your investment!“

- 15 different laser machines available (2 VOTAN[®] A)
- Test your own applications with our application team



- Prototype production, pre-series testing
- Development of material related processes
- Support of process related product design
- Training

Sharing Excellence in Laser Processing Systems

JENOPTIK | Lasers & Material Processing
JENOPTIK Automatisierungstechnik GmbH
Konrad-Zuse-Strasse 6
07745 Jena

Phone: +49 3641 65-2534
Fax: +49 3641 65-2540



sales-lps.lm@jenoptik.com
service-lps.lm@jenoptik.com



www.jenoptik.com/lasermachines



Thank you for your attention!

