Glass Performance Days 2025

10 – 12 JUNE 2025 | NOKIA ARENA - TAMPERE, FINLAND

GLASS PERFORMANCE DAYS 2025

Laser Glass Processing – Next Generation

Dr. Thomas Rainer

Agenda

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LASER-NANOTECHNOLOGIES IN GLASS

- Status of Laser Glass Processing
- Task – Find the Bottleneck
- Solutions and Examples
- Summary

Status of Laser Glass Processing

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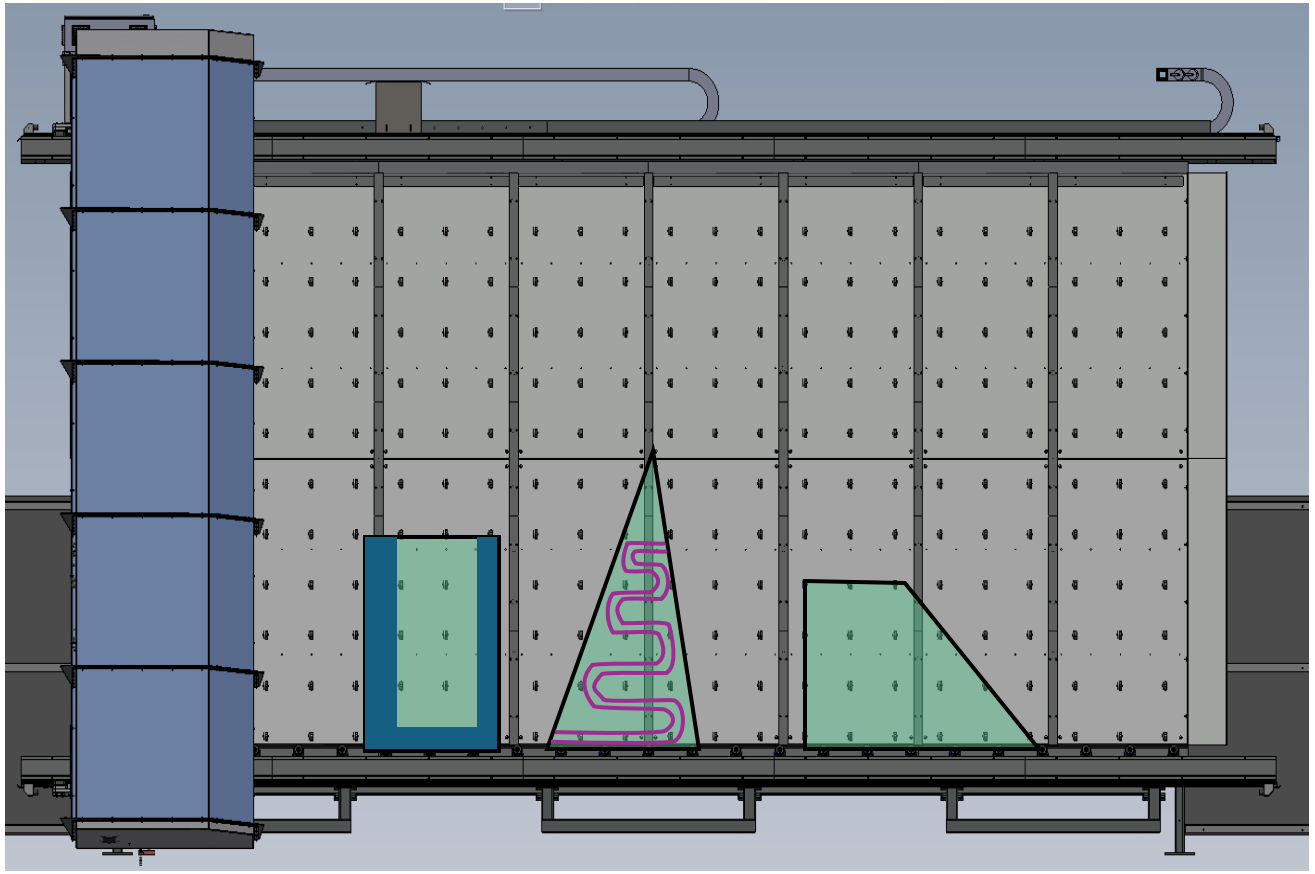

Status of Laser Glass Processing

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laser*bird* smart
Higher value creation through laser-assisted glass finishing

laser*bird* smart
Höhere Wertschöpfung durch lasergestützte Glasveredelung

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Status of Laser Glass Processing

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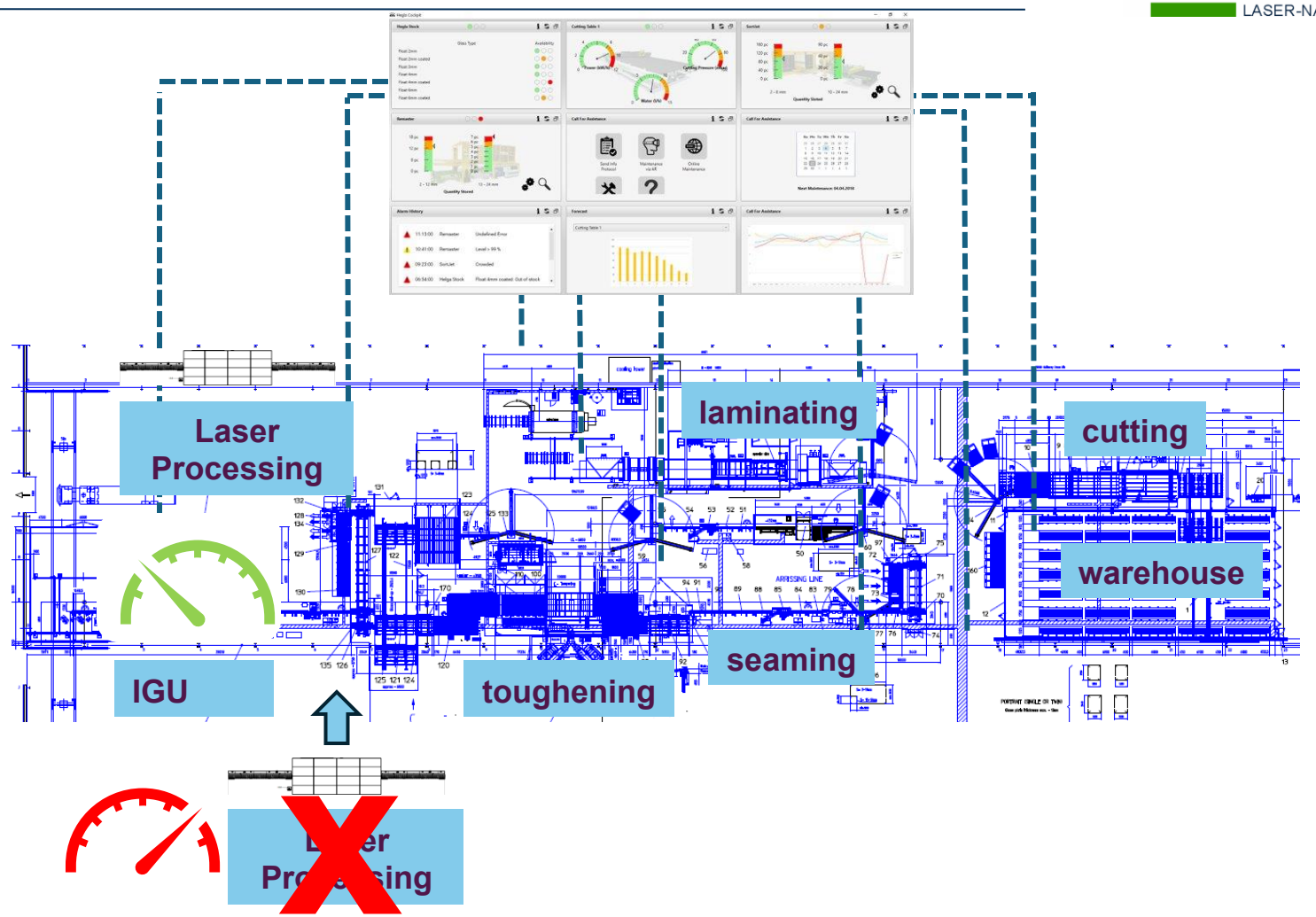

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Task – Find the Bottleneck

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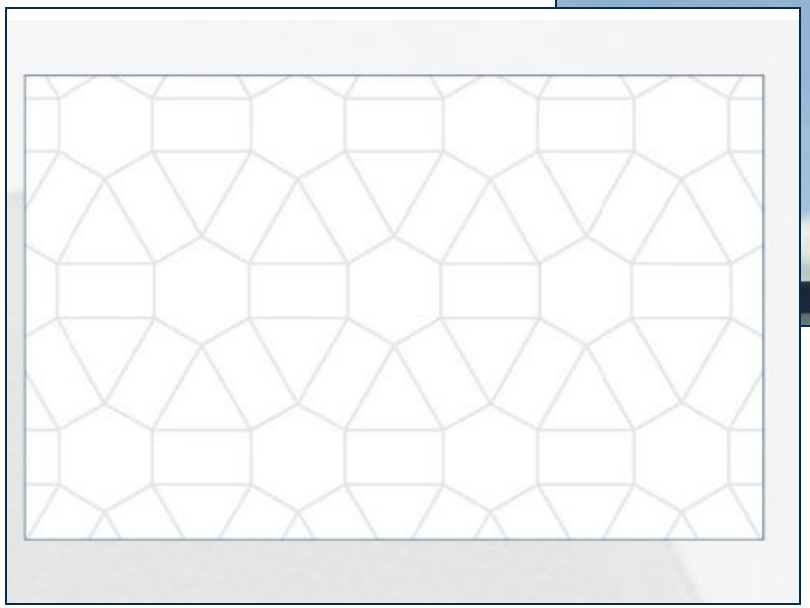
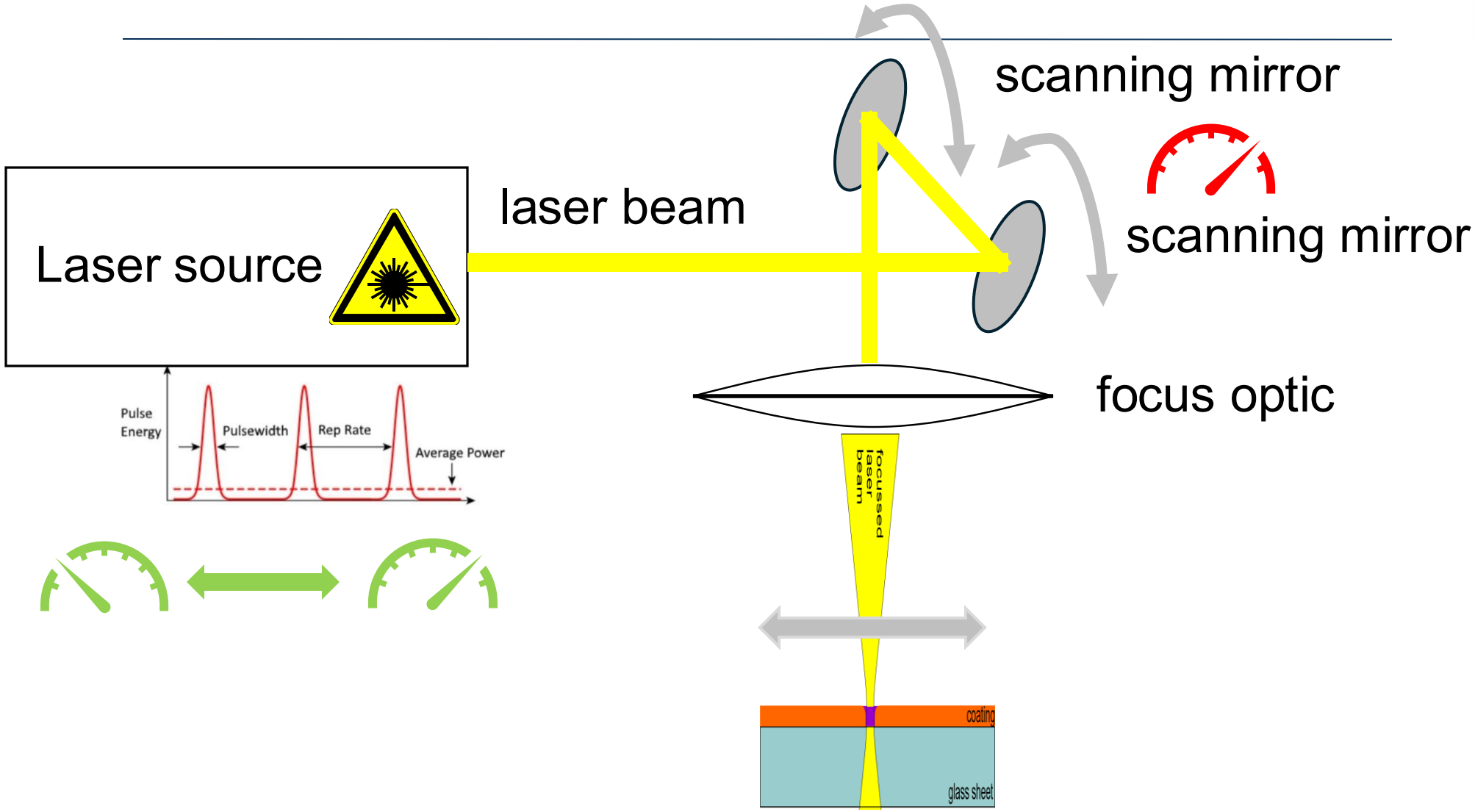
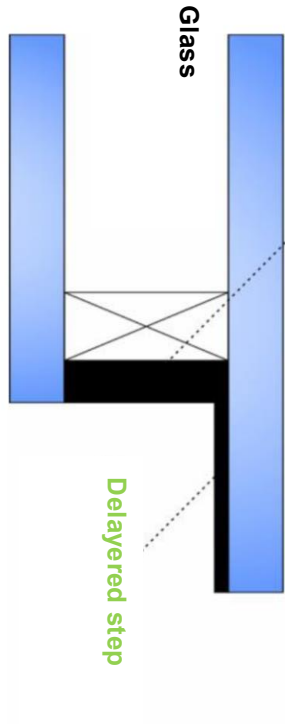
Example: Improved smart phone reception



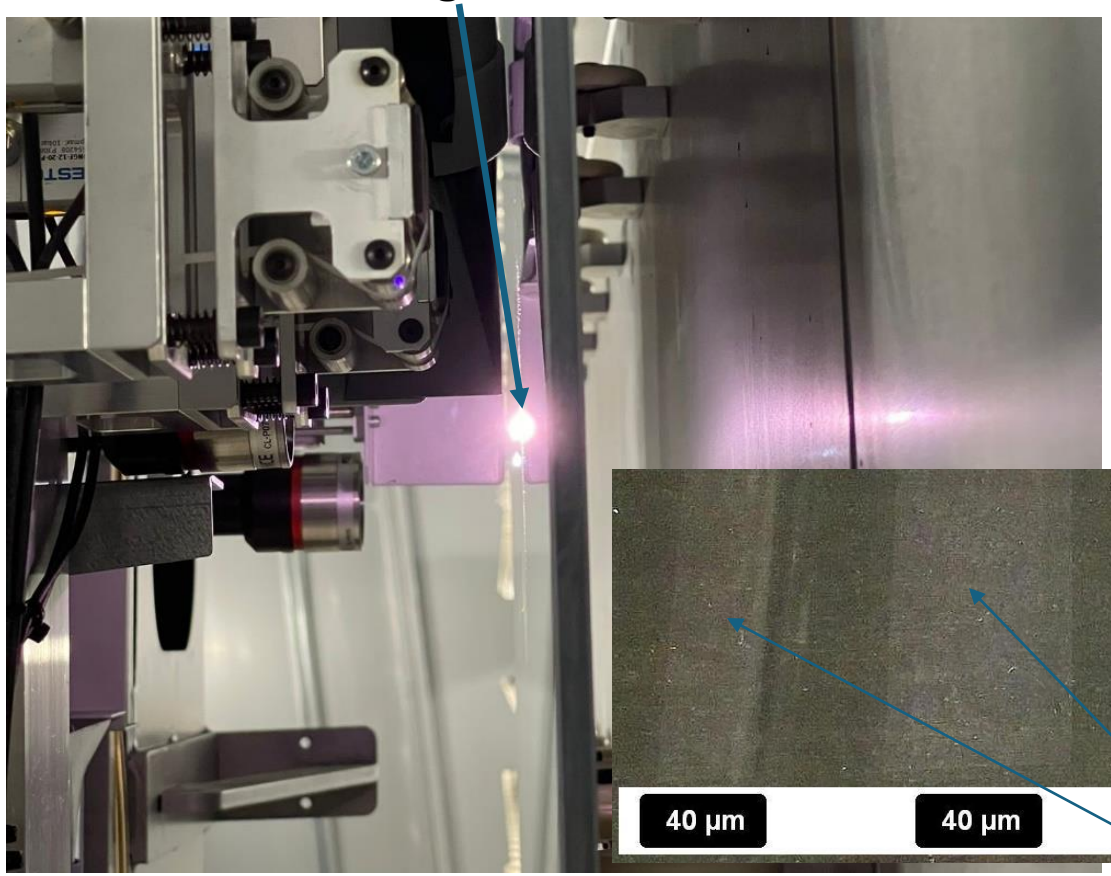
Task – Find the Bottleneck

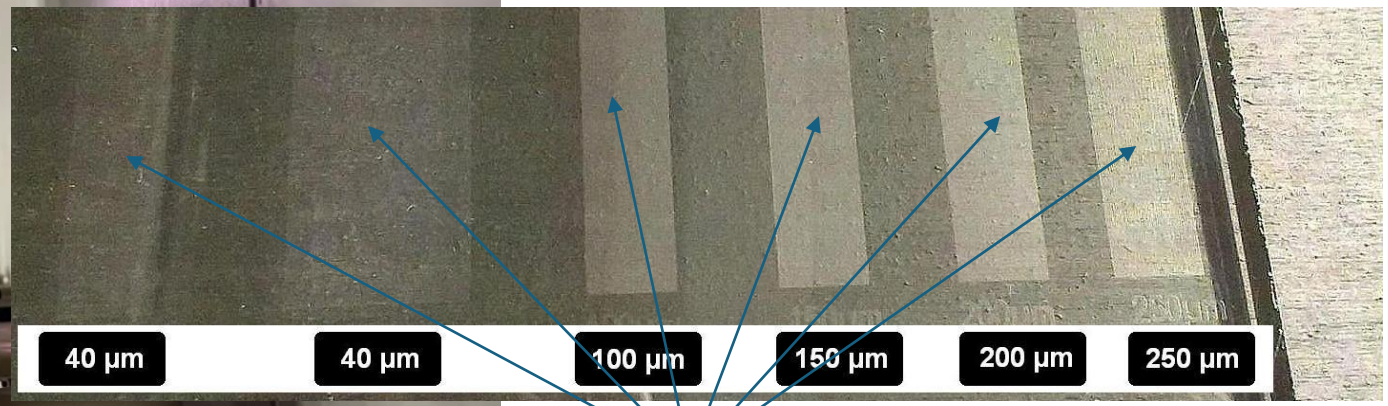


Solution – Example – Step Unit



Decoating with laser removal





De-layered areas

Solution – Example – Step Unit

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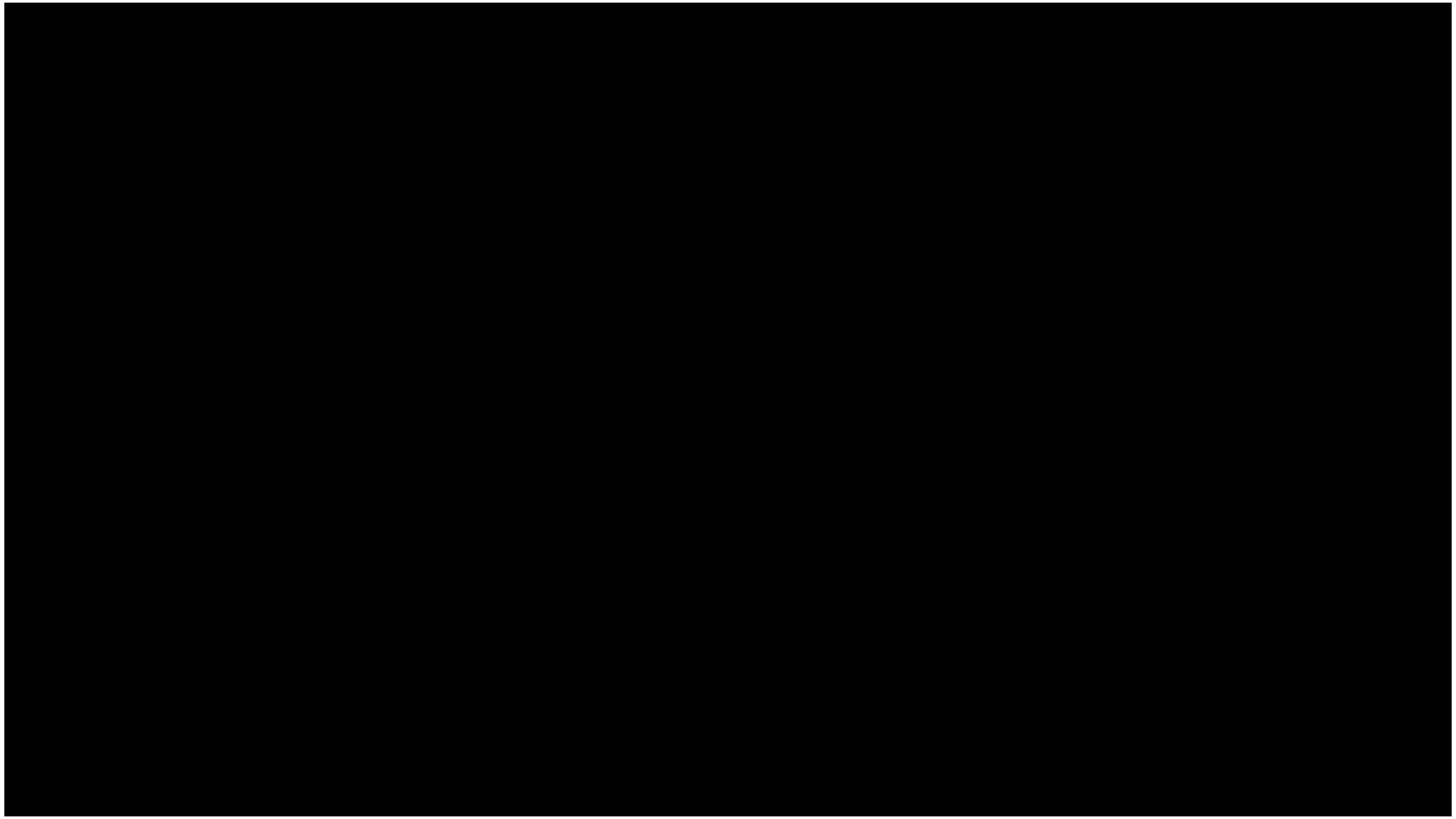
Video shows the laser decoating process at maximum speed and 10 mm track width



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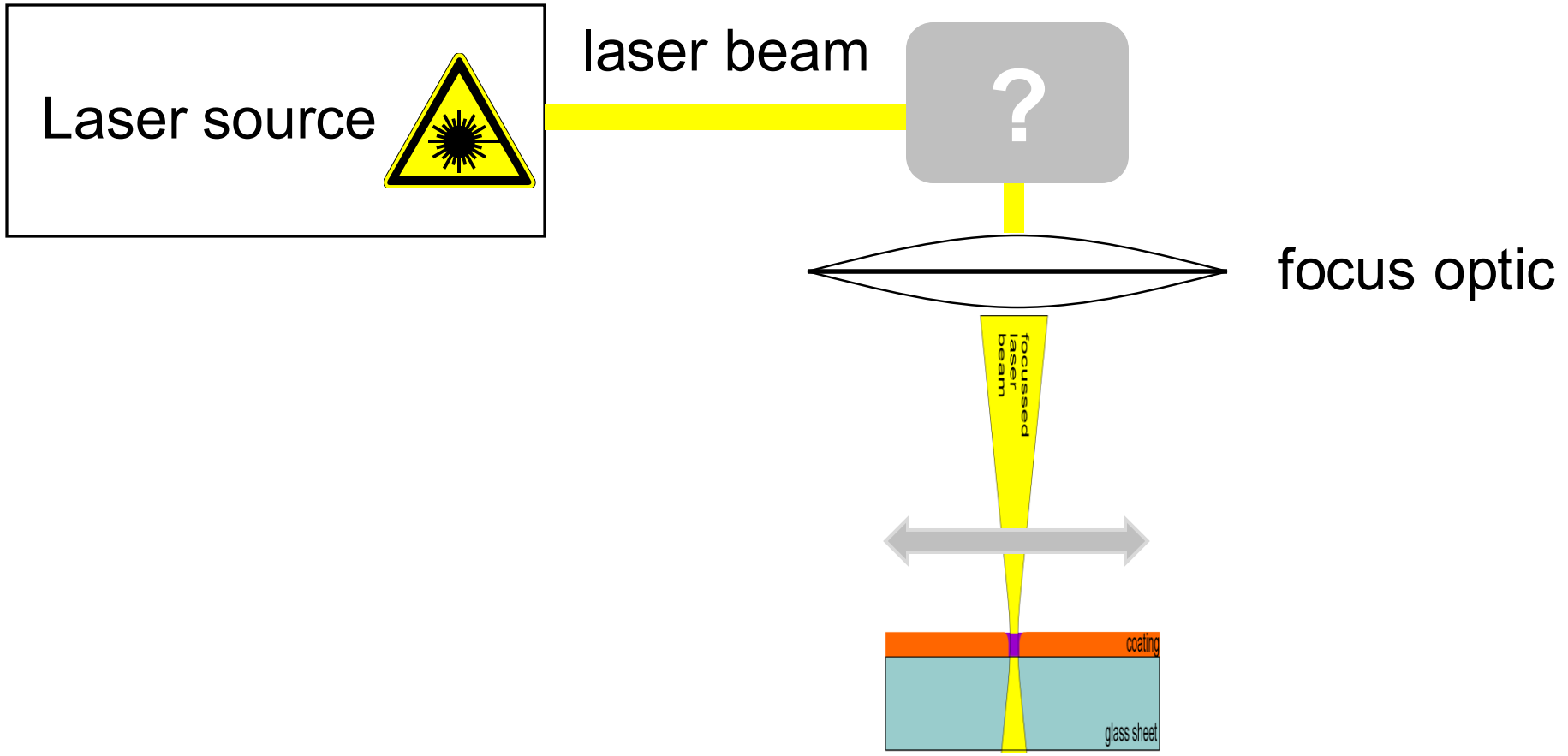
Solutions


Laser source
laser beam
?
focus optic
focussed laser beam
coating
glass sheet

Solution – Example – Step Unit

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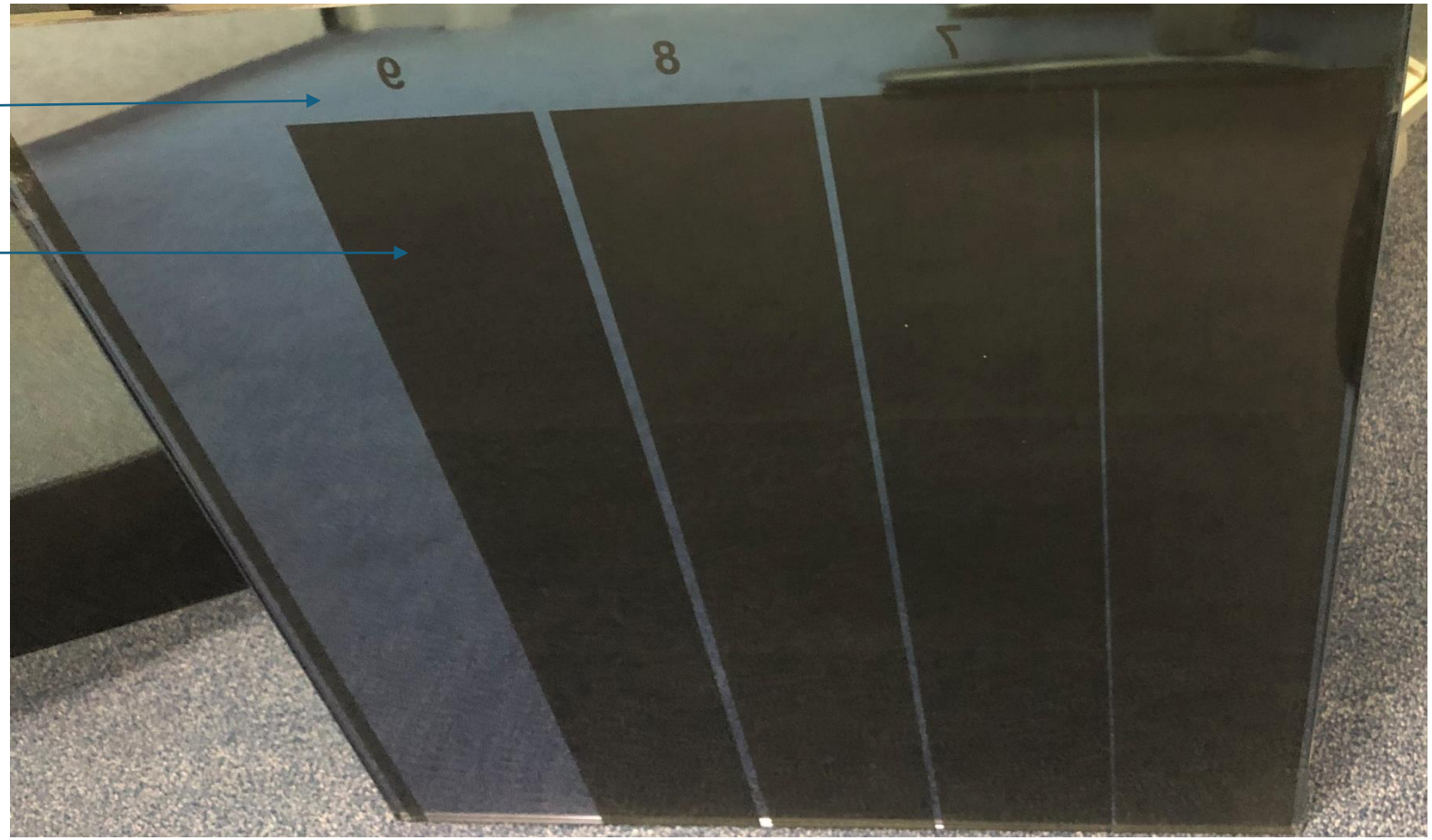
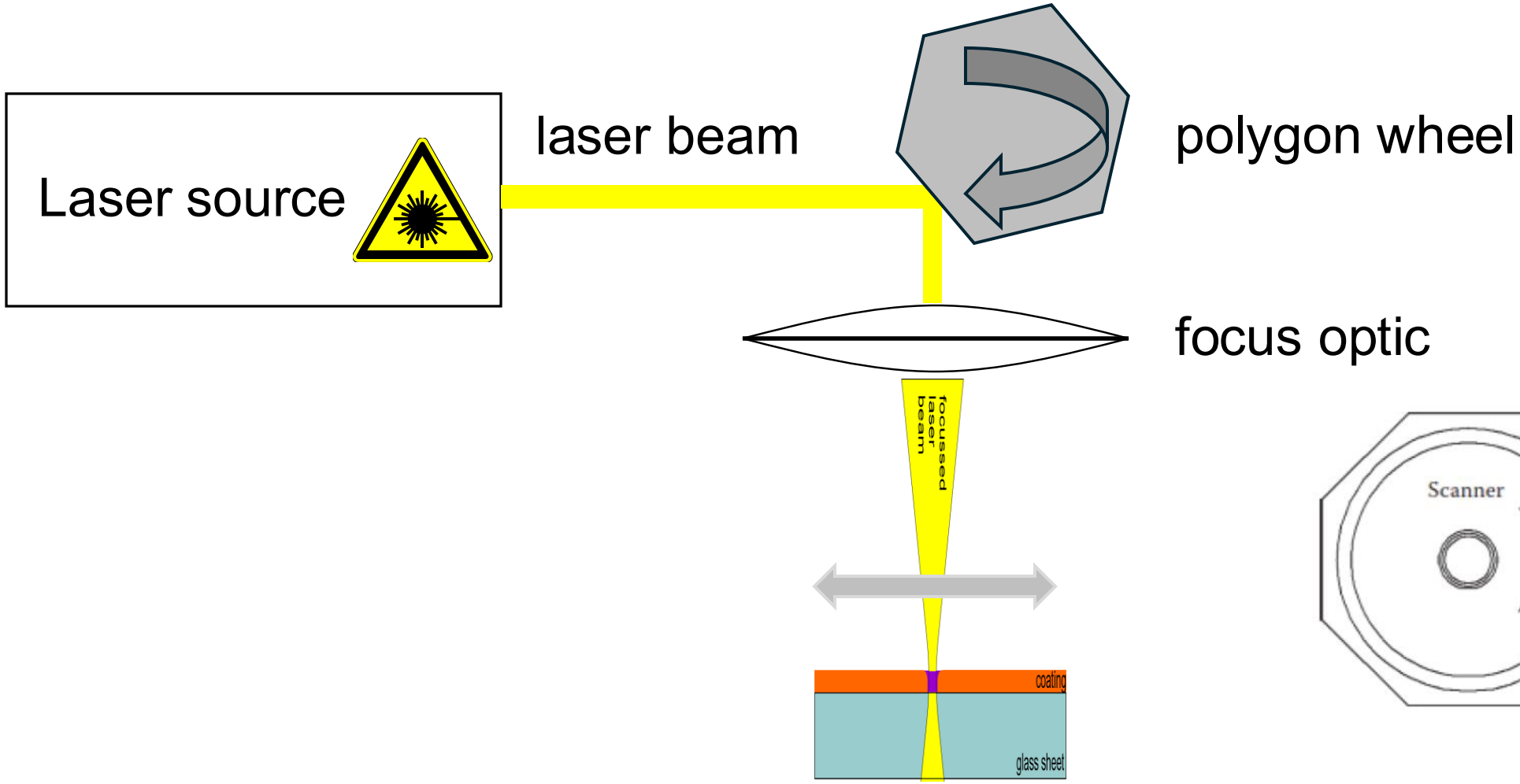
Glass in its final state with black, ceramic printing

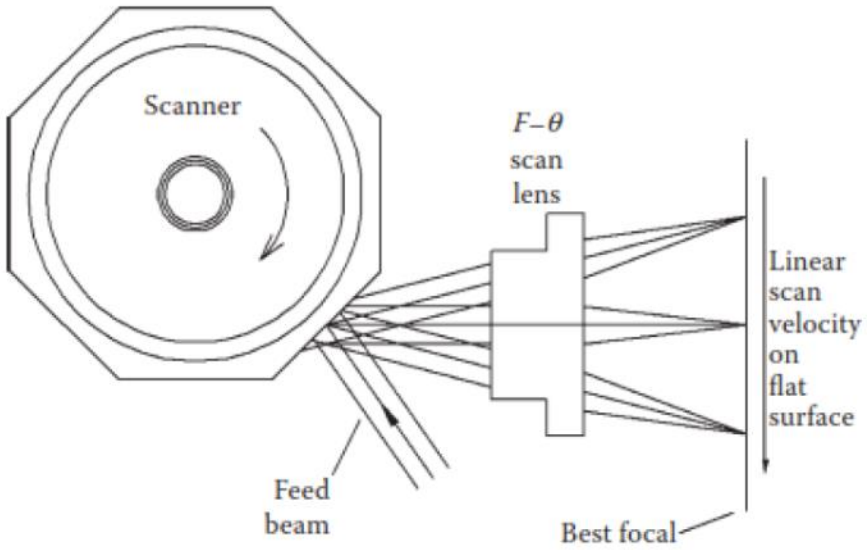
Non-de-coated areas

Laser decoating area



Solutions





G. F. Marshall und G. E. Stutz, Hrsg., Handbook of optical and laser scanning, in Optical science and engineering, no. Vol. 147. Boca Raton, Fla: CRC Press, 2012

Solution

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Solution

Width = 80 mm

Speed = 60 mm/s

Solution

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Facts:

- up to 100 mm width strip in one step
- area performance = 0,05 m^2/min - 0,5 m^2/min (mechanical removal = 0,2 m^2/min)
- homogenous coating removal
- no damage of the glass surface
- cold process

Example for Integration

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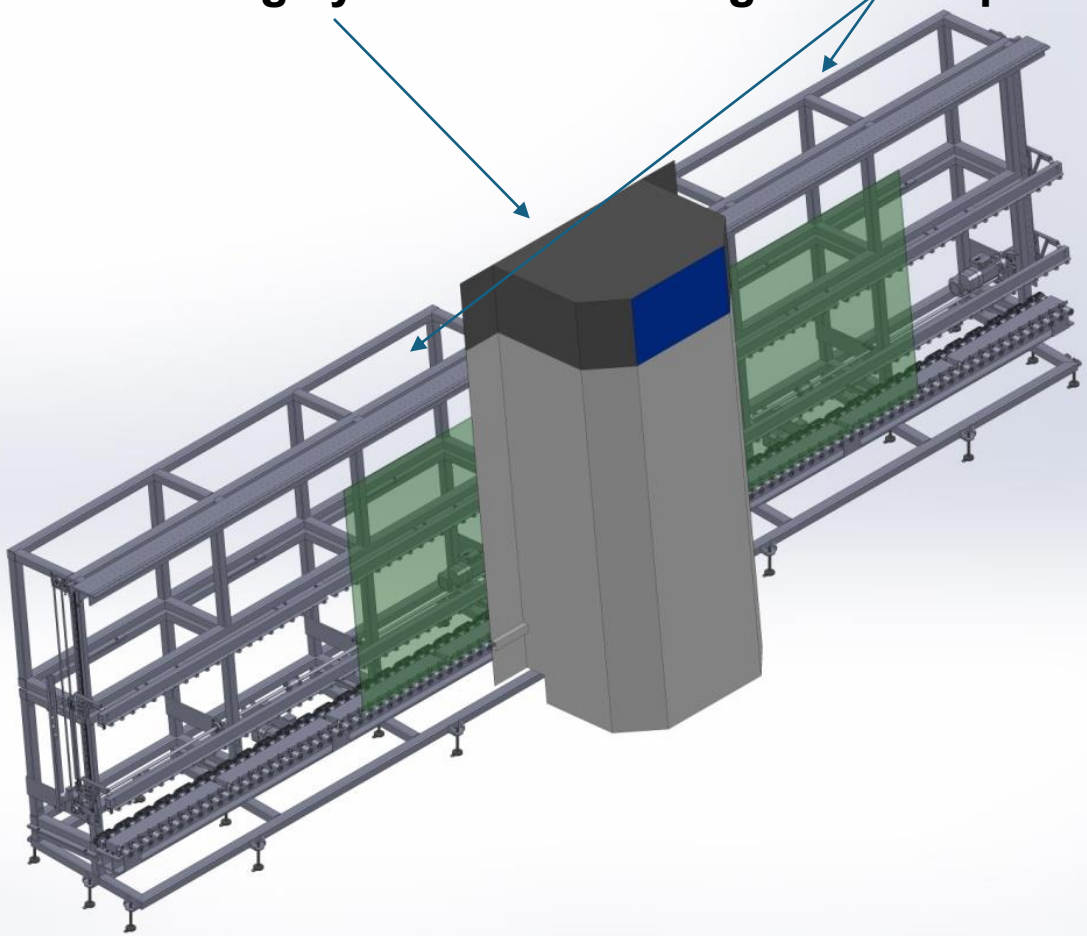
Laser decoating system between 2 glass transport conveyors:



Example for Integration

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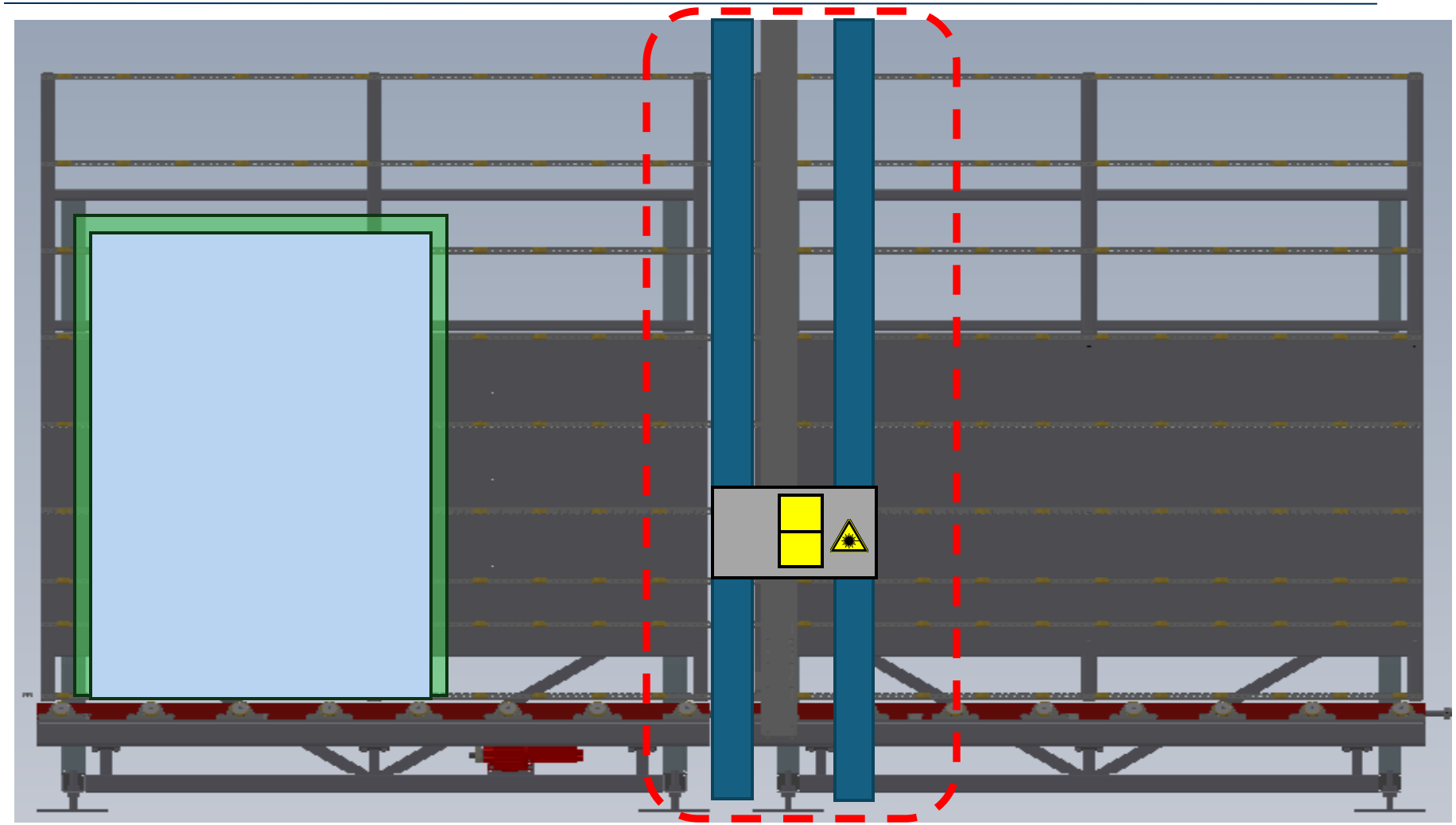

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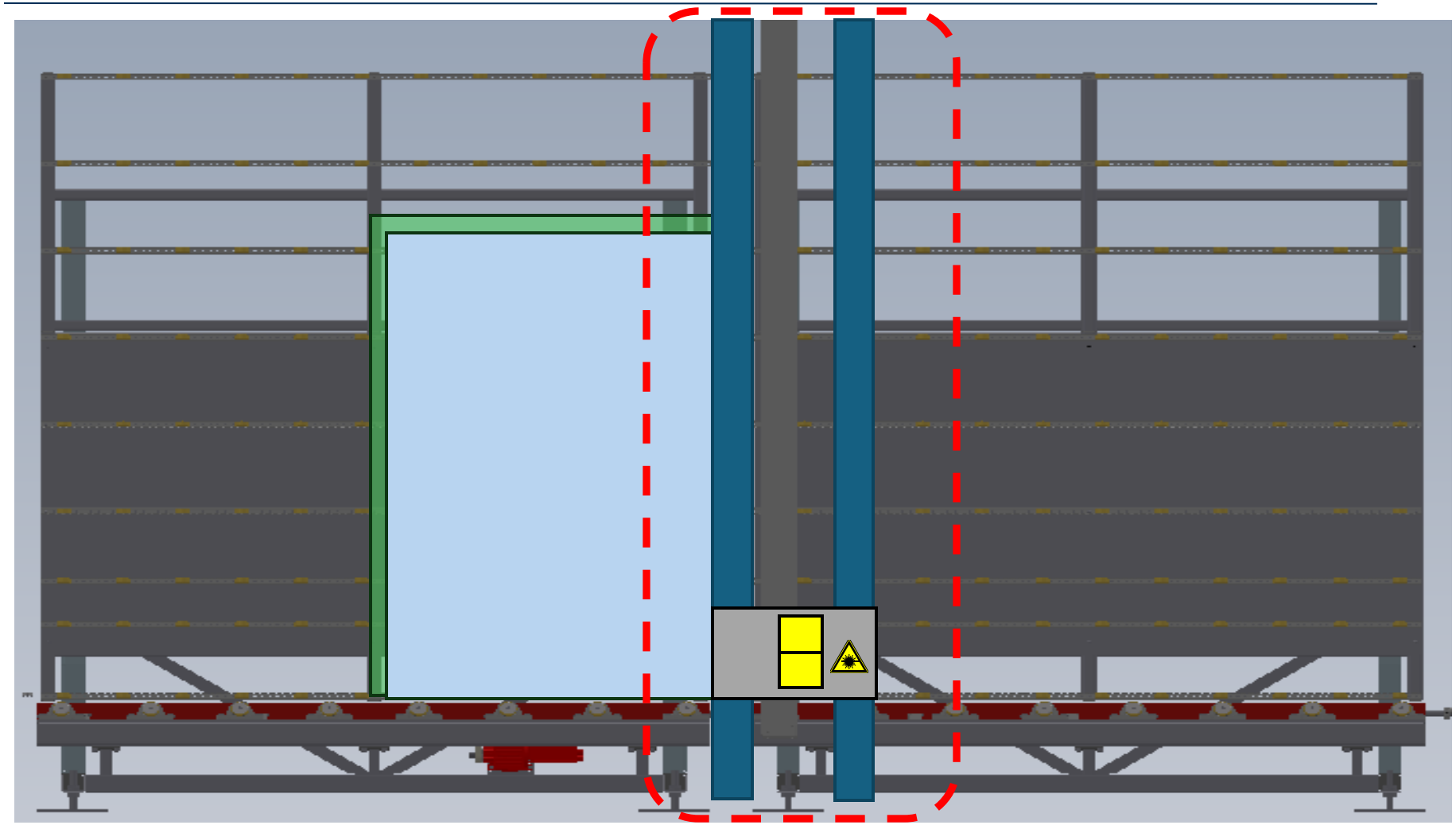

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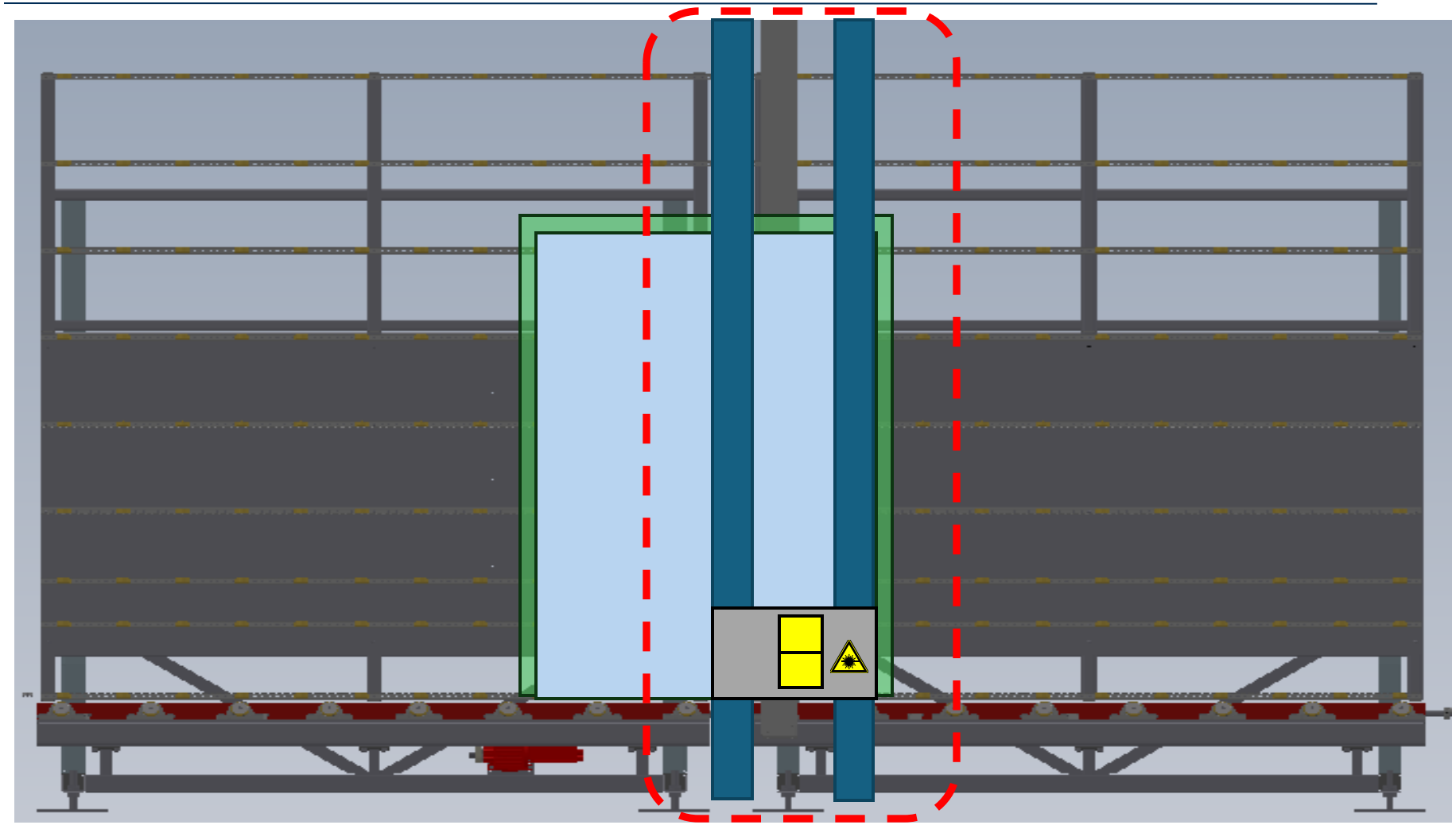

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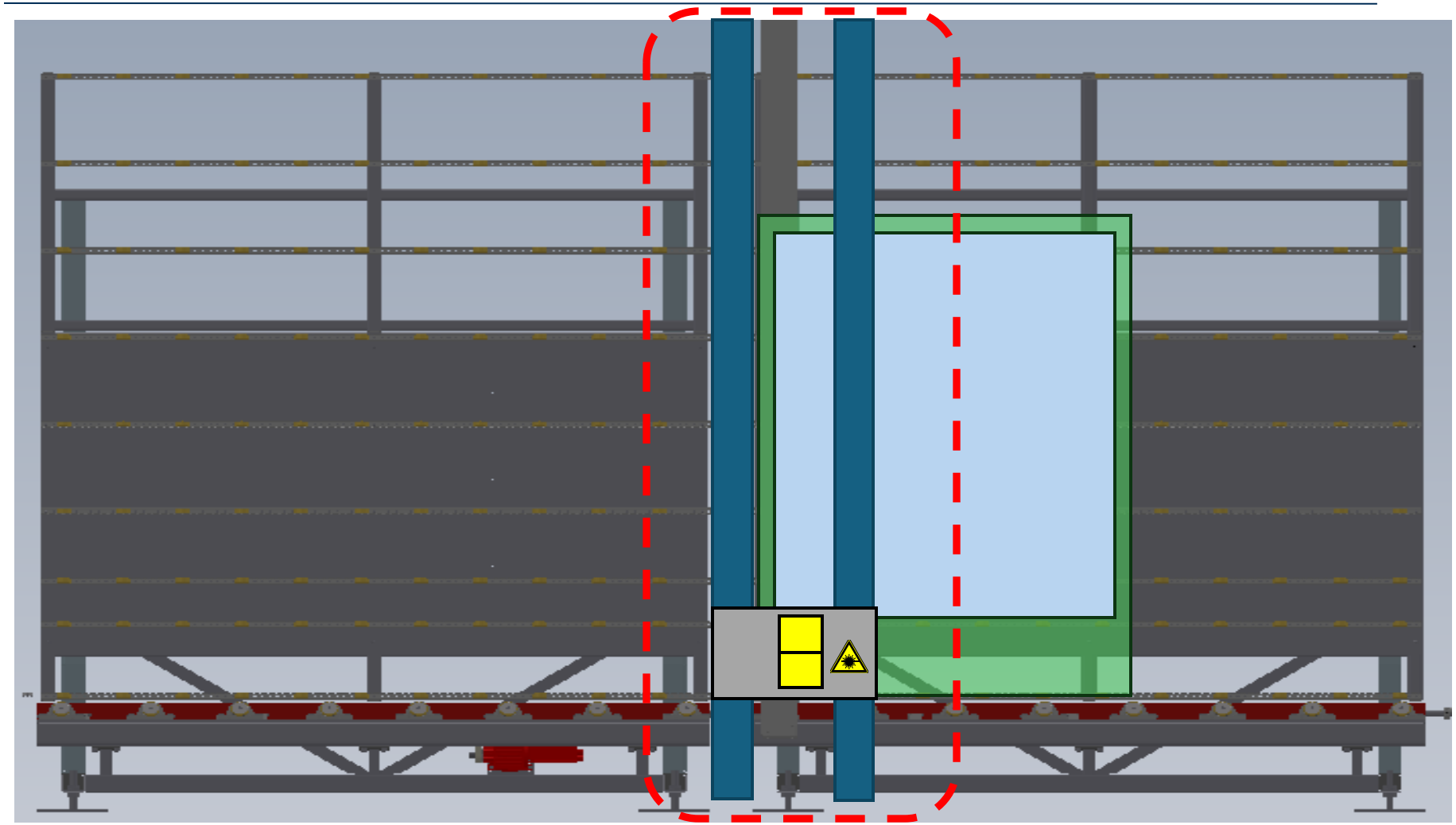

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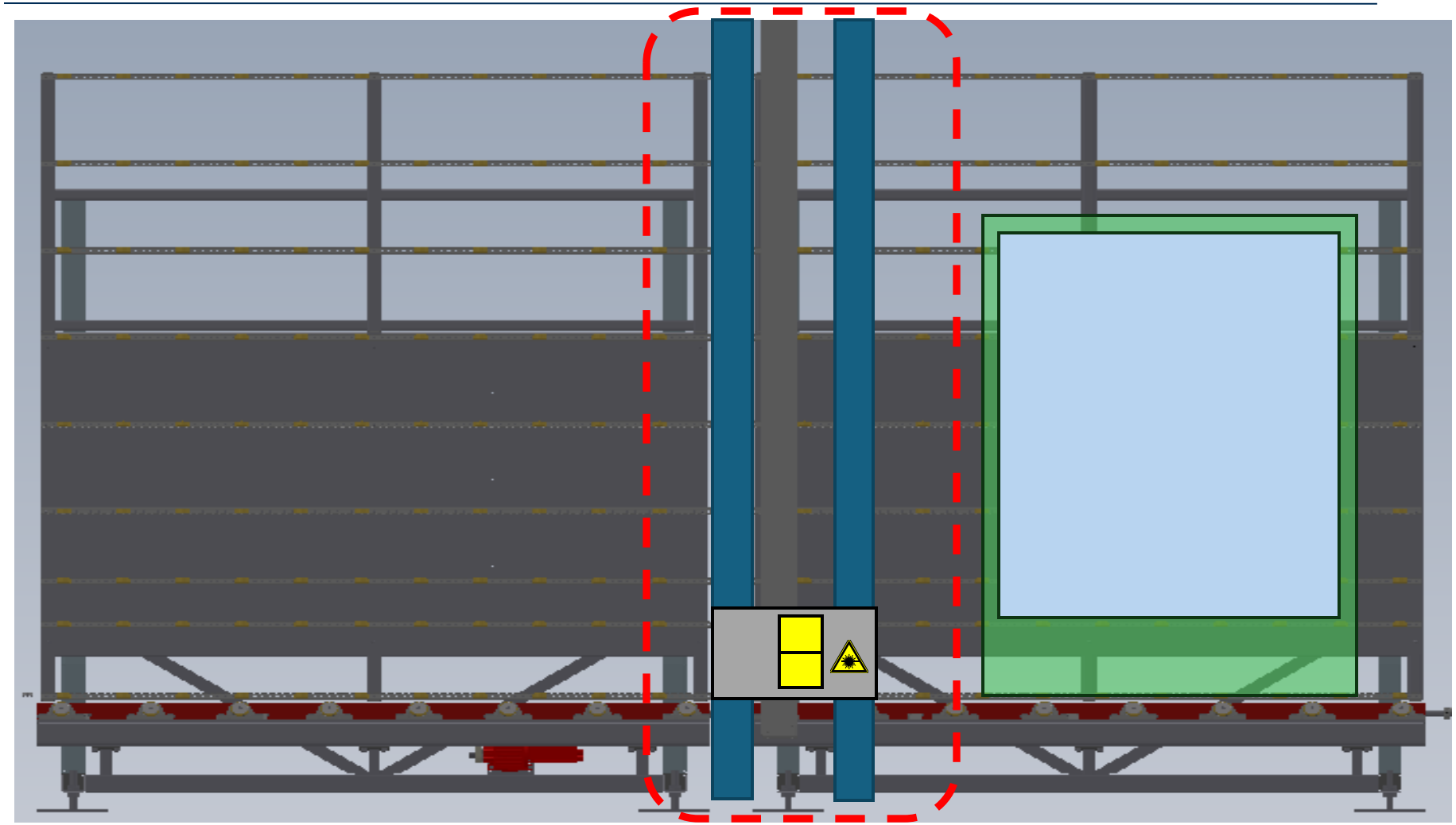

Advantages for the process in front of an IGU line

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Advantages:

- tempering of the coated glass without different thermal behaviour, because the glass is fully coated => high quality of the tempered glass
- cycle time of the step coating removal fits to IGU line cycle time

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Summary

- **Eliminating the speed limit of laser beam deflection by using alternative scanning technologies**

- **Laser Step Edge Coating Removal:**
  - more productive than conventional de-coating, reinforced by the lower proportion of dead time during laser processing
  - connect the laser process to the IGU line
  - very good de-coating quality

Summary

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	Laser edge decoating State of the art	Laser edge decoating New Technology
Speed	1.2 m/min for 10 mm wide strips **10 runs x 20 mm = 100 mm**	up to 5 m/min for **100 mm** wide strips
Quality	like an uncoated glass surface	like an uncoated glass surface
Dust	hardly, because of combustion and good suction	hardly, because of combustion and good suction
Integration into production	standalone equipment	before cutting the glass / in front of the IGU line
RESULT	**due to very low surface removal rate, it is not economical compared to mechanical de-coating**	**high area removal rate = economical + very good quality**

Thank your for your kind attention!

Dr. Thomas Rainer

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