



Retrofit Kits for Glass Machines.

Customer Service Sales Booklet

Innovations for a better world.

 **BUHLER**

Retrofit Solutions for Glass Machines



Customer Support and Services.

Always on hand to sustain your business.

- Bühler Leybold Optics provides retrofits for complete machines and upgrades of control systems on old systems.
- Bühler's worldwide customer service as well as the fast delivery of replacement and wear-and-tear parts are just two important aspects of customer support. Preventive maintenance and inspection together with machine re-conditioning and upgrading round-off the after-sales services.

Retrofit Solutions

PLC + Visualization upgrade.

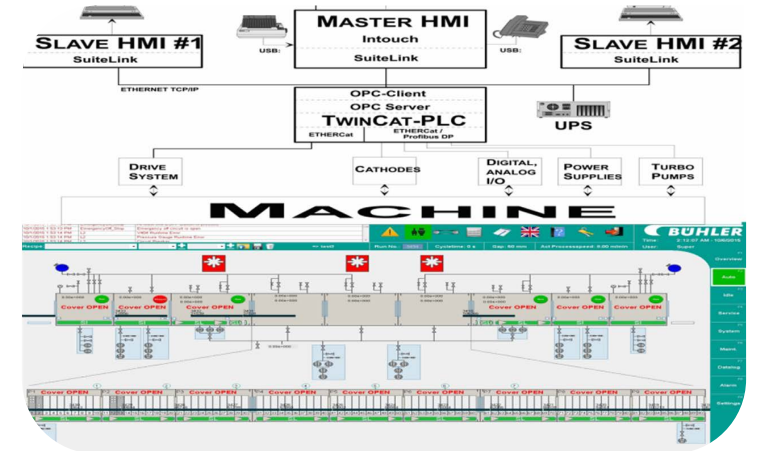
Solution:

- Fast and reliable service

Added value:

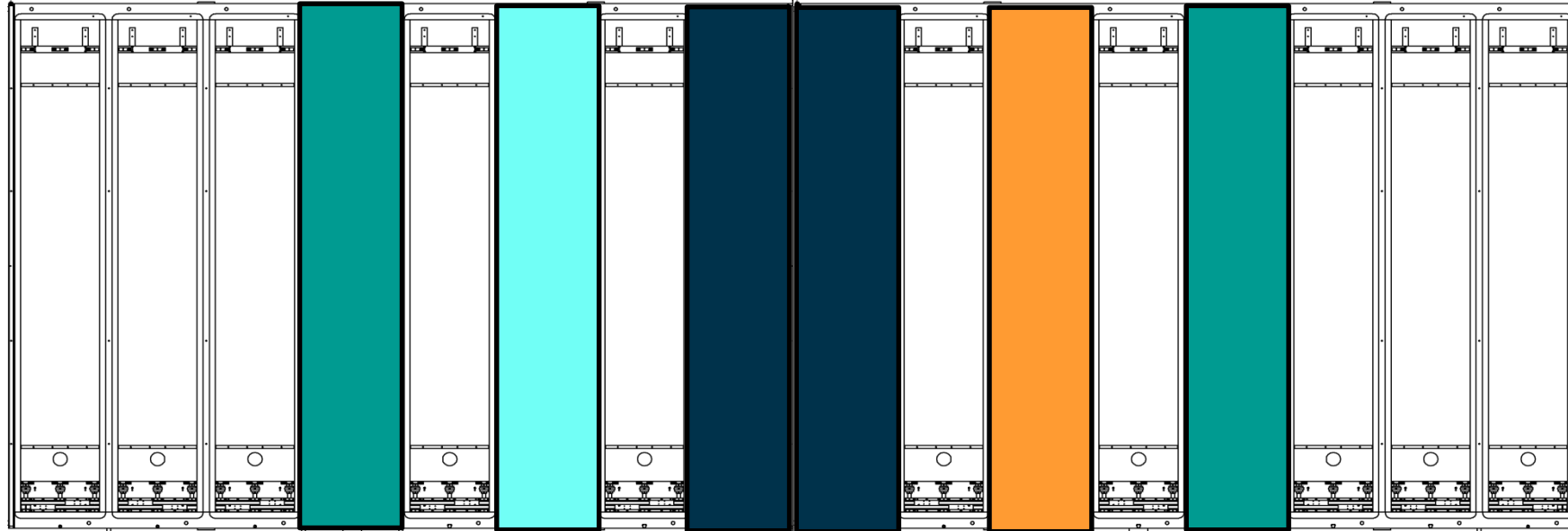
- The aim is to avoid downtimes and to keep the machines running
- One contact for all services

Lead time: 8 weeks
Installation time: 2 – 4 days
Approx. costs: 120k €
(depending on configuration)



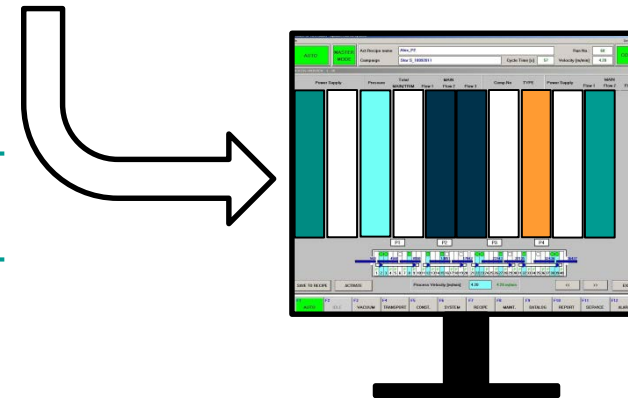
Retrofit Solutions

Flexible change of machine configuration.



Lead time: 12 weeks
Installation time: 1 week

- Easy adaption to customers individual product mix
- Automatic self re-configuration after machine modification
- All process relevant parameters keep linked to the cathodes, not to the chamber position



Retrofit Solutions

Extended Additional Process Chamber.

Solution:

- Space for 10 new additional compartments
- Replacement of auxiliary chamber
- Improvement of cycle time
- Expansion of the process for new coatings/ products

Added value:

- Additional processes
- Increased up time and reduced cycle time due to extended additional process chamber

Lead time: 8 weeks
Installation time: 2 days
Approx. costs: 18k €

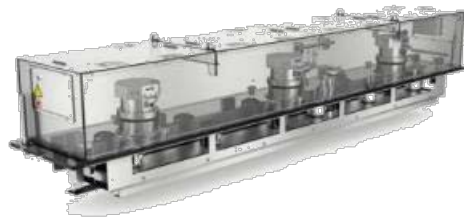


Retrofit Solutions

Additional functional compartments.

Key benefits:

- Additional process stations
- Increased up time and reduced cycle time due to additional compartments
- Increased throughput of more complex products



Lead time: 16 weeks
Installation time: 2 days
Approx. costs:
180k - 220k €
(depending on configuration)



Retrofit Solutions

Planar Cathode PCA Magnetron Compartment.

Solution:

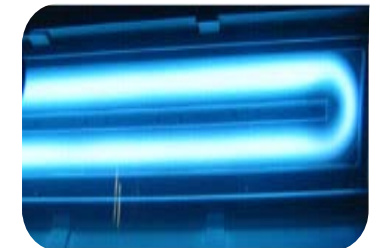
- Highest layer uniformity of $\leq \pm 1\%$
- High target material utilization

Added value:

- Maintenance cost reduction
- Spare parts cost reduction



Lead time: 16 weeks
Installation time: 2 days
Approx. costs:
140 k € (single)
180 k € (double)



Retrofit Solutions

Rotatable Cathode RCA Compartment.

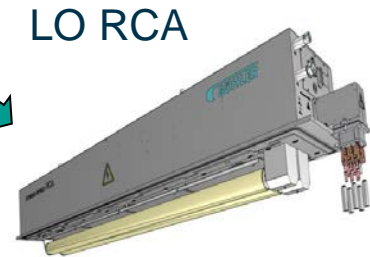
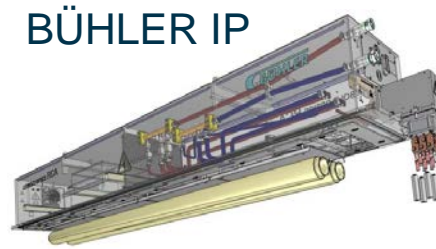
Solution:

- Highest layer uniformity
- High target material utilization

Added value:

- Reduction of maintenance costs
- Reduction of spare part costs

Lead time: 16 weeks
Installation time: 2 days
Approx. costs:
180k € (single)
220k € (double)



Retrofit Solutions

Gap Management.

Solution:

- Minimization of target material waste due to 30 mm gap between single batches
- Minimized machine contamination: Minimized wear and tear of transport rollers etc.
- Highest deposition yields: Reduced wastage of target material

Added value:

- Longer times between maintenance/ cleaning
- Reduction of the gap between glass substrates to 50 mm
- Increased production efficiency
- Shortened maintenance and cleaning
- Saves up to 200.000m² of coating material per cathode p.a. compared to industries standard with 100 mm gap

Lead time: 16 weeks
Installation time: 3 weeks
Approx. costs: 250k – 420k €
(depending on installed hardware)

Active gap control between batches.



Retrofit Solutions

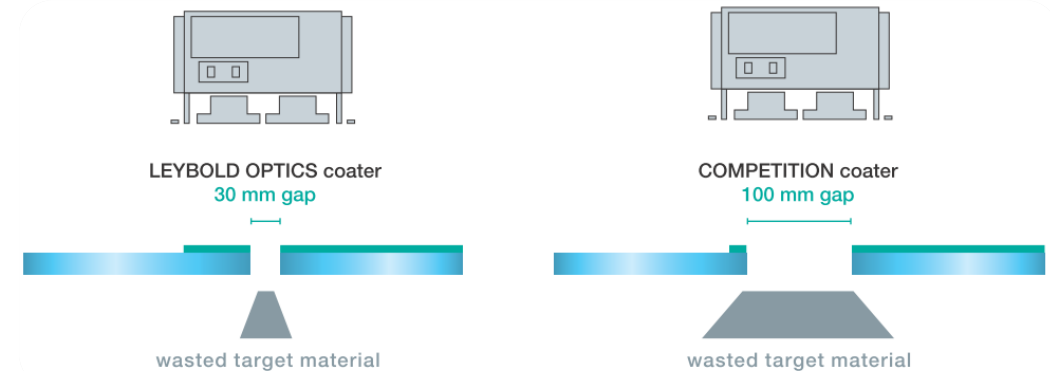
Gap Management.

Key benefits:

- Minimum target waste
- Maximum productivity
- Minimum maintenance/cleaning
- Constant gap even between different substrate thicknesses
- Optimized for flexible production conditions

- Savings app. 1.5 mio USD/ 10 years **
- App. 2 more production days/ year
- 70 % less roller contamination

Gap management provides smallest gap in industry (50 +30/-20 mm*)



* Depending on machine type, mechanical age and status

** PPG heat treatable DLE reference stack



Retrofit Solutions

Pump Set/ Additional Pump Unit Upgrade.

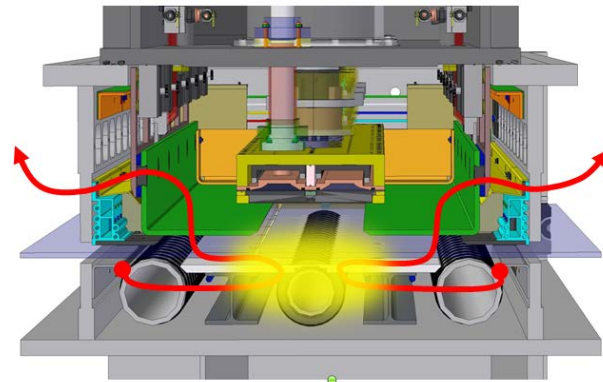
Solution:

- High gas separation factors by intermediate Ar-purging

Added value:

- Highly cost efficient
- Excellent maintainability
- Excellent process stability

Lead time: 16 weeks
Installation time: 2 days
Approx. costs: 180k €



Retrofit Solutions

Ex/ In-Situ Measurement Upgrade.

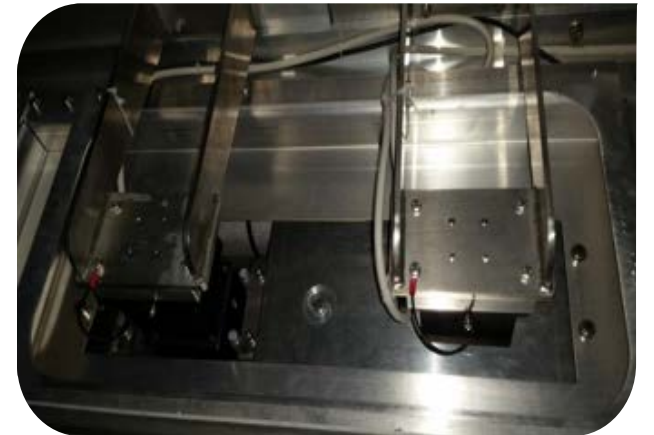
Solution:

- A flexible and easy-to-use software interface for all applications
- Continuous data and automation model for all applications along the production line

Added value:

- Maximum accuracy under production conditions
- High measurement frequency

Lead time: 16 weeks
Installation time: 7 days
Approx. costs: 240k - 300k €
(depending on configuration)





Retrofit Solutions Gas Distribution.

- Improvement of process capabilities for high quality products



Retrofit Matrix for Glass Machines

Retrofit Matrix for Glass Machines.

BLO LAC Coater

PLC + Visualization

Flexible Change of Configuration

Extended Additional Process Chamber

Additional functional compartments

Planar Cathode PCA Compartment

Rotatable Cathode RCA Compartment

Gap Management

Pump Set/ Additional

Pump Unit Upgrade

Ex/ In-Situ Measurement

Gas Distribution



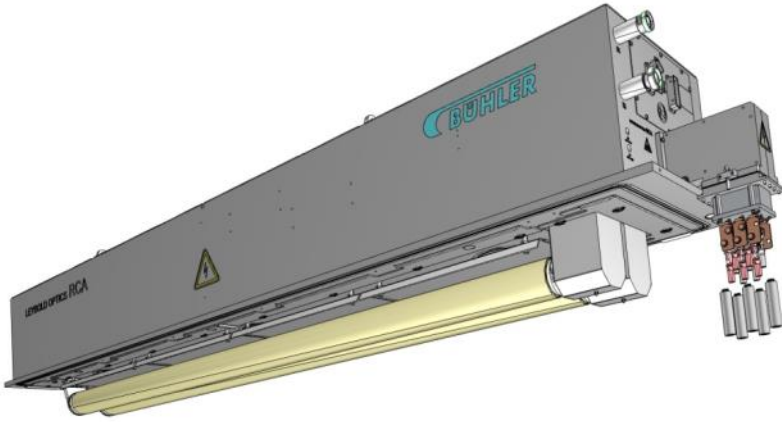
Consumables for Glass Machines

Consumables for Glass Machines.

Planar Cathode



Rotary Cathode



In the Region for the Region.

Differentiation through expansion of global service network.

90 service stations worldwide...

... for customer service along the entire lifecycle of their solutions.

- Continued investment in our skills on-site with our Service Academy.
- Ongoing initiatives for the reduction of our reaction time for customer enquiries.
- Commitment to highest service quality.



Engineering Customer Success.

Bühler 2017

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