Ophthalmic optics.

– Anti-reflection (AR) coatings
– Fashion mirror coatings
– Sun glasses
– Sports glasses

BÜHLER

Ophthalmic optics solutions by Bühler.
The latest in anti-reflection technology... and beyond.

As one of the world leaders in thin-film technology, we develop and manufacture vacuum deposition equipment for a broad range of applications. The foundation for our firm's present-day success was laid by inventors Ernst Leybold and Wilhelm Carl Heraeus 160 years ago. Today, Bühler Leybold Optics is a globally active high-tech company, with the business area's headquarters in Alzenau (Germany) and subsidiaries in Cary (USA) and Beijing (China). Worldwide, we employ over 300 employees. Since 2012, Leybold Optics has been part of the Bühler Group. Headquartered in Switzerland, Bühler is one of the world's leading suppliers of industrial equipment with a presence in over 140 countries. A top priority for us is innovation leadership.

Perfect design and impeccable function – made possible with Bühler Leybold Optics solutions.

No player in the field comes even close to Bühler Leybold Optics' wealth of optical process and deposition system know-how. We shaped the ophthalmic industry with a series of break-though innovations, starting with the first anti-reflective eyeglass coatings in the 1950s. Since then, numerous milestones have been achieved:

1960's Introduction of bell-jar systems, enabling the first industrial ophthalmic optics applications

1970's First successful anti-reflective and scratch-protection coatings on CR-39 lenses

1980's Introduction of plasma-assisted deposition processes

2000's Turnkey laboratory solutions with MINI LAB and EASY LAB

2003 Antistatic and superhydrophobic coatings

2009 Latest-generation proprietary ion-source LION

Since 2012 Bühler Leybold Optics displays by far the most ample systems portfolio and process library in the ophthalmic optics industry

2013 Introduction of LEYBOLD OPTICS MCS as a perfect match for our MICRO LAB solutions

2014 Introduction of BOXER 900, dedicated to mid- to high-volume production

2015 Introduction of STAR – a versatile sputter coater for smallest batch sizes

Solutions for eyeglass coatings.
We offer the broadest portfolio in the market.

As an important step toward expanding the Advanced Materials Business within Bühler with a strategic focus on environmentally friendly and energy-saving technology, Leybold Optics was acquired in May 2012. With this acquisition, Leybold Optics became part of a family-owned conglomerate of specialists and technology partners for plant, equipment and services for manufacturing advanced materials and for processing basic foods. Not only does Bühler now hold the leading market position in the field of aluminum die casting, transforming grain into flour and feeds, and making pasta and chocolate, but also in vacuum thin-film coating.

Within Bühler, we are stronger than ever and in an even better position to drive our most modern coating solution, process expertise and 1st class service and thus maintain our leading role in optical thin-film vacuum deposition equipment. Over the next few years, we want to focus on our existing expertise in emerging markets with our most eco-friendly coating solution and an outstanding cost-performance ratio. Additionally, we will invest in high-quality technology for developed markets to provide new applications.

We are centering our efforts on ensuring our customers' success by improving our core-component technologies with a strong focus on cost of ownership. Our advances, for example in architectural layer-stack design, aim not only for performance and reliability but also for cost efficiency.

Every year we spend a significant amount on basic research and applied development to further improve our technology with regard to quality and precision, sustainability, serviceability and the ecological footprint of our design and systems.

Sincerely yours

Antonio Requena
Managing director
Bühler Alzenau GmbH
Leybold Optics

Leybold Optics – portfolio overview.
Smart solutions for Rx and stock-lens production.

SYRUS series
Known in the market as the undisputed workhorse for high-volume 24/7 production, these machines are setting benchmarks due to their highly productive, reliable and cost-efficient setup, thus making SYRUS the ideal choice whenever large batches are feasible.

Productivity 350 - 960 pairs / 8 h

Page 8

LEYBOLD OPTICS ECS series
This coater series comprises systems especially optimized for the local requirements of Asian markets focused on low-cost mass production. In this segment, its throughput per CAPEX ratio is the industry benchmark.

Productivity 180 - 890 pairs / 8 h

Page 12

BOXER series
The BOXER series with chamber sizes of 700 mm and 900 mm is a highly flexible, mid-size to high-volume platform for Rx and stock-lens production. It excels with intelligent, robust design and a compact footprint.

Productivity 100 - 460 pairs / 8h

Page 15

LEYBOLD OPTICS CCS series
The LEYBOLD OPTICS CCS series is a unique concept, especially optimized for the needs of small to medium Rx laboratories. Its modular philosophy allows to start with a low initial investment. As business demand grows, a wide range of upgrades are available to match.

Productivity 50 - 160 pairs / 8h

Page 19

STAR 4/90
The STAR sputter coater delivers coated lenses much faster than standard evaporation technologies. This enables retailers to serve their customers with an individual pair of Rx lenses ready-to-wear in less than one hour.

Productivity 32 - 40 pairs / 8h

Page 22

LEYBOLD OPTICS MCS 480
The design and size make this AR coater easy to install in small labs of 200 to 250 sq.ft. or less.The MCS platform can be combined with Bühler Leybold Optics' turnkey lab packages, MICRO LAB with our spin- or dip-coating solutions.

Productivity 25 - 60 pairs / 8h

Page 24

LEYBOLD OPTICS UCS series
These machines are employed in our ophthalmic lab installations when best cleaning results are required. With a variety of standard recipes installed as standard, these machines are well prepared for any kind of substrate.

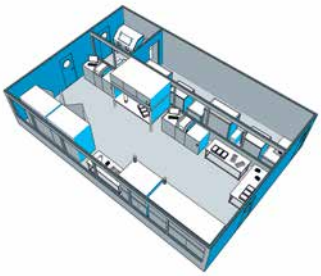
Productivity 20 - 600 pairs / 8 h

Page 28

LEYBOLD OPTICS CHC series
The LEYBOLD OPTICS CHC series coaters bring together ultrasonic cleaning and dip-coating functionality to deliver a perfect hard-coating performance which is second to none.

Productivity 20 - 600 pairs / 8 h

Page 29



Ophthalmic optics labs
Bühler Leybold Optics offers complete turnkey, tailored solutions for building up complete ophthalmic optics labs. Based on our broad machine portfolio and own process know-how, we are the partner of choice when entering the ophthalmic optics market.

Page 30

Leybold Optics – advanced coating technology.
More efficiency, reliability and flexibility.

Leybold Optics – solutions for ophthalmic optics applications:

- Anti-reflective (AR) coatings
- Mirror coatings
- Fashion coatings
- Hydrophobic and superhydrophobic coatings

Customer benefits:

- Personalized processes adjusted to fit customer needs
- Easy-to-use advanced software
- Optimized for floor space and infrastructure requirements
- Quick exposure and removal of protective chamber liners
- Ergonomic, user-friendly design
- Easy maintenance
- Remote analysis via online connection and data logging
- Plug-and-coat design
- Clean-room compatible
- Simple click-fixing of substrate carrier
- Numerous hardware upgrades available

SYRUS series. (350 - 960 pairs / 8 h)
The benchmark in the eyeglass industry.

SYRUS 1350

SYRUS series – highest throughput and unbeatable cost-per-lens

Bühler Leybold Optics SYRUS coaters are the most productive and cost-efficient ophthalmic-coating plants to be found on the market today. Designed for large batches, both for classical stock-lens mass-production and for Rx production, the SYRUS series excels with unsurpassed cost-benefit ratios. A special configuration optimized for (super)hydrophobic top-coat applications is also available.

Various calotte segmentations available

(e.g. SYRUS 1350)

	4-segment calotte (90° format)		**3-segment calotte** (120° format)	
Diameter	Lenses/sector	Lenses/batch	Lenses/sector	Lenses/batch
Ø 60 mm	74	296	101	303
Ø 65 mm	63	252	86	158
Ø 70 mm	55	220	72	216
Ø 75 mm	47	188	63	189
Ø 80 mm	43	172	56	168

Technical features:

1. Multiple-quartz-crystal sensor system for maximum process safety
2. Click-in mechanism for quick and easy substrate exchange
3. Maximized cold-trap surface area to optimize pumping of water vapor
4. LEYBOLD OPTICS HPE series electron-beam gun with multi-pocket crucibles
5. Bühler Leybold Optics ion source control and power supply
6. Optimized distribution-masks system for highest rates and uniformity

SYRUS series. (350 - 960 pairs / 8 h)
Available in three chamber sizes.

Key Benefits:

- Three chamber sizes of 1100 mm, 1350 mm and 1500 mm
- Ideal for high-volume stock-lens production
- Broadest variety of configurations
- In-chamber (super)hydrophobic coatings

SYRUS 1100

(310 - 510 pairs / 8 h)
Chamber size 1100 x 1100 mm

- Fore-vacuum: 300 l/s vane pump and 1000 l/s roots pump
- High-vacuum: 12000 l/s diffusion pump
- Electron-beam gun: LEYBOLD OPTICS HPE 6
- Ion sources: Mark II+
- Dual-quartz-crystal monitoring
- Cryogenic refrigerator: MaxCool
- Heating system
- Optional: 2nd uniformity mask

SYRUS 1350

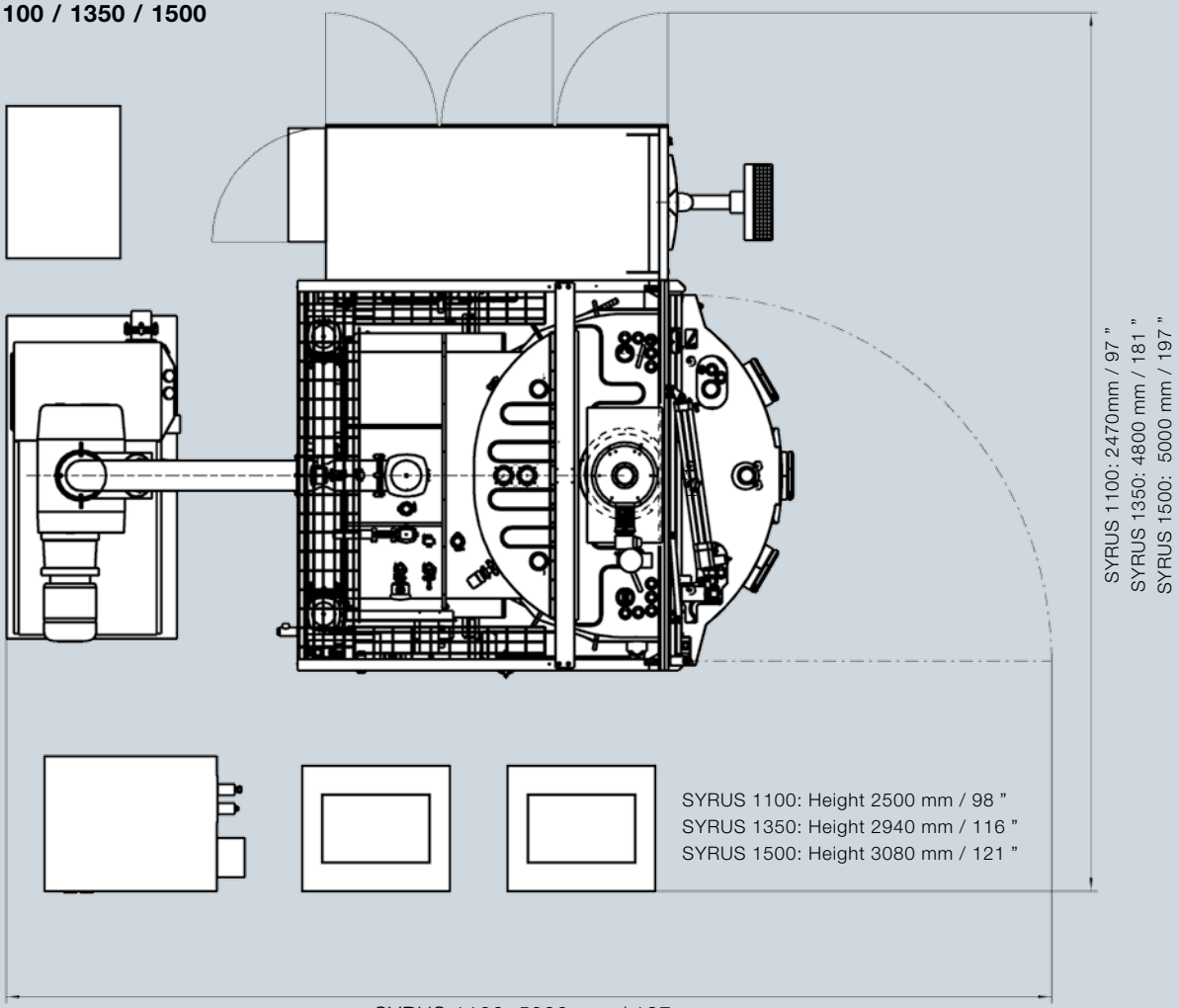
(600 - 890 pairs / 8 h)
Chamber size 1350 x 1550 mm

- Fore-vacuum: 300 l/s vane pump and 1250 l/s roots pump
- High-vacuum: 20000 l/s diffusion pump
- Electron-beam gun: LEYBOLD OPTICS HPE 12/10
- Ion sources: Mark II+
- Dual-quartz-crystal monitoring
  Optional: 6-fold quartz-crystal monitoring
- Cryogenic refrigerator: MaxCool
- Heating system
- Two uniformity masks

Technical data

	4-segment calotte	SYRUS 1100	SYRUS 1350	SYRUS 1500
Loading capacity [pcs.]	Ø 65 mm	168	252	272
	Ø 70 mm	144	220	240
	Ø 75 mm	128	188	204
	Ø 80 mm	108	172	184
Process time	Single-sided	40 min	35 min	35 min
Dimensions	Chamber diameter	1100 mm / 43.3"	1350 mm / 53.1"	1500 mm / 59.1"
Components	Electron-beam gun	LEYBOLD OPTICS HPE 6	LEYBOLD OPTICS HPE 12/10	LEYBOLD OPTICS HPE 12/10
	Pre-vacuum pump	300 m^3/h	300 m^3/h	630 m^3/h
	Roots pump	1000 m^3/h	1250 m^3/h	2000 m^3/h
	Diffusion pump	12000 l/s	20000 l/s	2 x 12000 l/s

SYRUS 1100 / 1350 / 1500



SYRUS 1100: 5000 mm / 197 "
SYRUS 1350: 5500 mm / 217 "
SYRUS 1500: 5410 mm / 213 "

LEYBOLD OPTICS ECS series. (180 - 890 pairs / 8 h)
Obtaining optimum value from investment.

Key benefits:

- Two chamber sizes of 700 and 1350 mm
- For mid- to high-volume stock lens production
- Optimum CAPEX performance ratio
- Technology entirely from Bühler Leybold Optics
- Proprietary Bühler Leybold Optics processes available

LEYBOLD OPTICS ECS series –
cost-effective production with high performance

The LEYBOLD OPTICS ECS coater series is Bühler Leybold Optics' offering for mass-production of eyeglass coatings where optimum value from investment is an uppermost requirement.

The LEYBOLD OPTICS ECS series is conceived to meet specific requirements of East Asian stock-lens manufacturers, such as large- batch production, ease-of-use and local adaptations. The configuration is streamlined according to the specific application, thus reducing initial investment – a smart choice for the savvy investor.

Technical features:

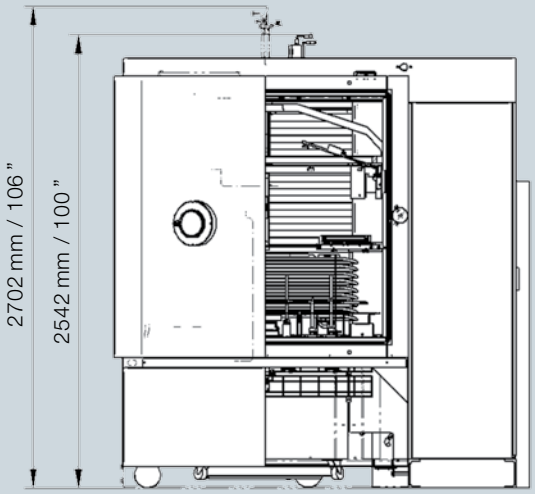
1. Optimized equipment configuration
2. Visualization in local language (Chinese)
3. Network connection and remote access
4. Fully modular concept
5. Compact footprint
6. Bühler Leybold Optics plasma sources and evaporators
7. Quartz-crystal monitoring

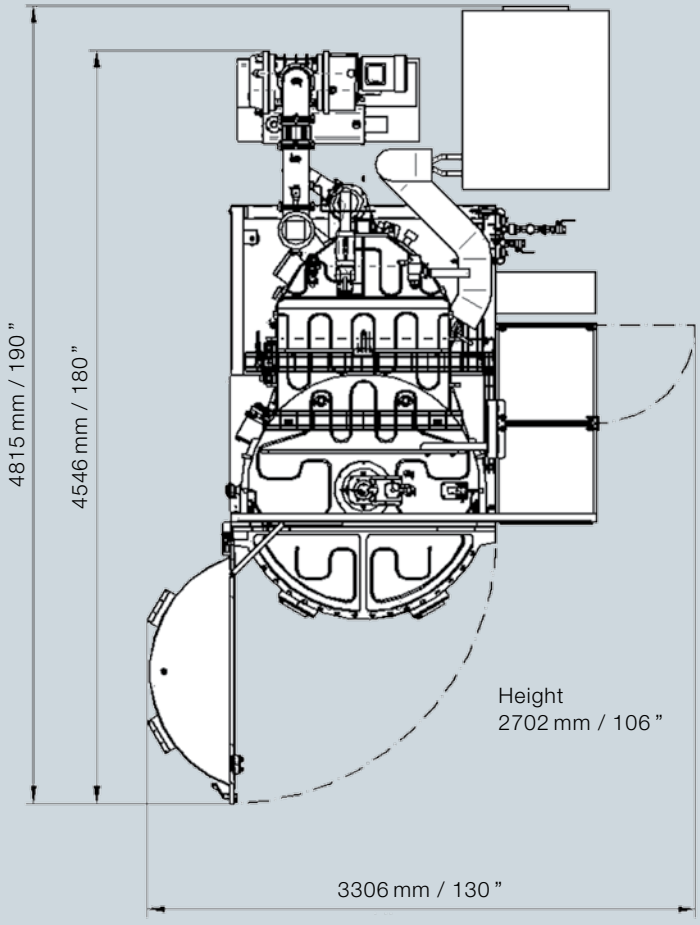
Technical data

		Leybold Optics ECS 710	Leybold Optics ECS 1350
Loading capacity [pcs.]	Ø 65 mm	71	285
	Ø 70 mm	62	253
	Ø 75 mm	--*	215
	Ø 80 mm	--*	--*
Process time	Single-sided	42 min	35 min
Components	Electron-beam gun	LEYBOLD OPTICS HPE 6**	LEYBOLD OPTICS HPE 12/10
	Ion source	Mark II**	Mark II**
	Pre-vacuum pump	300 m^3/h	300 m^3/h
	Roots blower	1000 m^3/h	1250 m^3/h
	Diffusion pump	12000 l/s	24000 l/s
	Thickness measuring	Single- or double-quartz-crystal	

(*) Available on request, (**) Other configurations available

LEYBOLD OPTICS ECS 1350





BOXER SERIES. (100 - 460 pairs / 8 h)
For versatile mid- to high-volume production.

BOXER 900

BOXER series – highly-flexible solution for Rx and stock-lens production

Uncompromising performance combined with an ingenious, compact design: This is the BOXER series. Its design facilitates easy and quick handling and maintenance.

From classic broadband anti-reflection coating to mirror coatings – a great number of different processes can be carried out with BOXER coaters. Moreover, if the demands on the system happen to change, its hardware can easily be upgraded.

Technical features:

1. Dual-quartz-crystal sensor system for maximum process safety
2. Bühler Leybold Optics ion-source control and power supply
3. LEYBOLD OPTICS HPE series electron-beam gun with multi-pocket crucibles
4. Maximized cold-trap surface area to optimize pumping of water vapor
5. Optimized distribution-masks system for highest rates and uniformity

BOXER series. (100 - 460 pairs / 8 h)
Expandable with ease.

Key benefits:

- Two chamber sizes of 700 and 900 mm
- For mid- to high-volume Rx and stock lens production
- Expandable system to increase productivity
- From 3-segment calotte to flip-over system or vice versa within 10 minutes
- Quick removal of protection shields for cleaning
  - BOXER 700: cubic coating chamber
  - BOXER 900: slidable shields

Basic configuration

BOXER 700
(70 - 100 pairs / 8 h)

- 3-segment calotte
- Turbomolecular pump: HiPace 2300
- Electron-beam gun: LEYBOLD OPTICS HPE 6
- Ion source: Mark I (In-chamber hydrophobic ICH)
- Ion pre-clean (IPC)
- Dual-quartz-crystal head

Priority upgrade

BOXER 700
(130 - 200 pairs / 8 h)

- 3-segment calotte Optional: flip-over
- Ion source: Mark I
- Turbomolecular pump: HiPace 1500
- Cryogenic-refrigeration system: Polycold
- Meissner trap
- Water chiller
- Ion-assisted deposition (IAD) process
- Process calibration

Superior upgrade

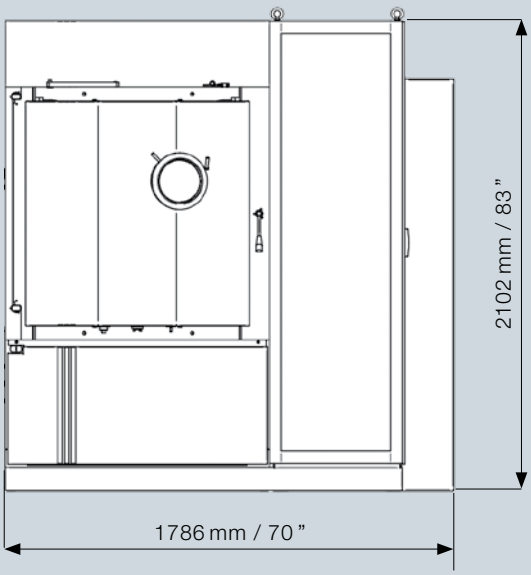
BOXER 700+
(140 - 210 pairs / 8 h)

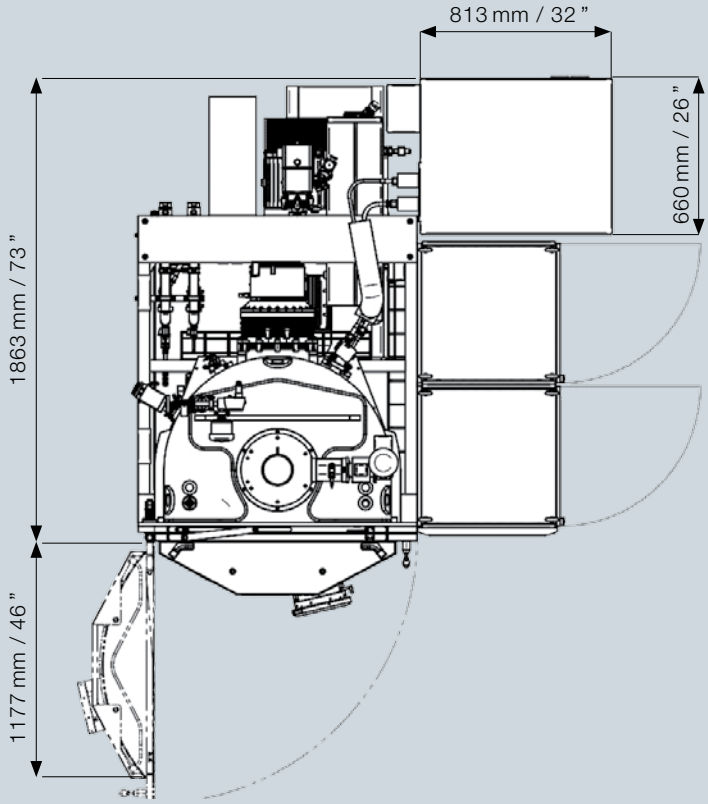
- 3-segment calotte Optional: flip-over
- Ion source: Mark II+
- Roots pump WSS01
- Second uniformity mask
- Gate valve
- Process calibration

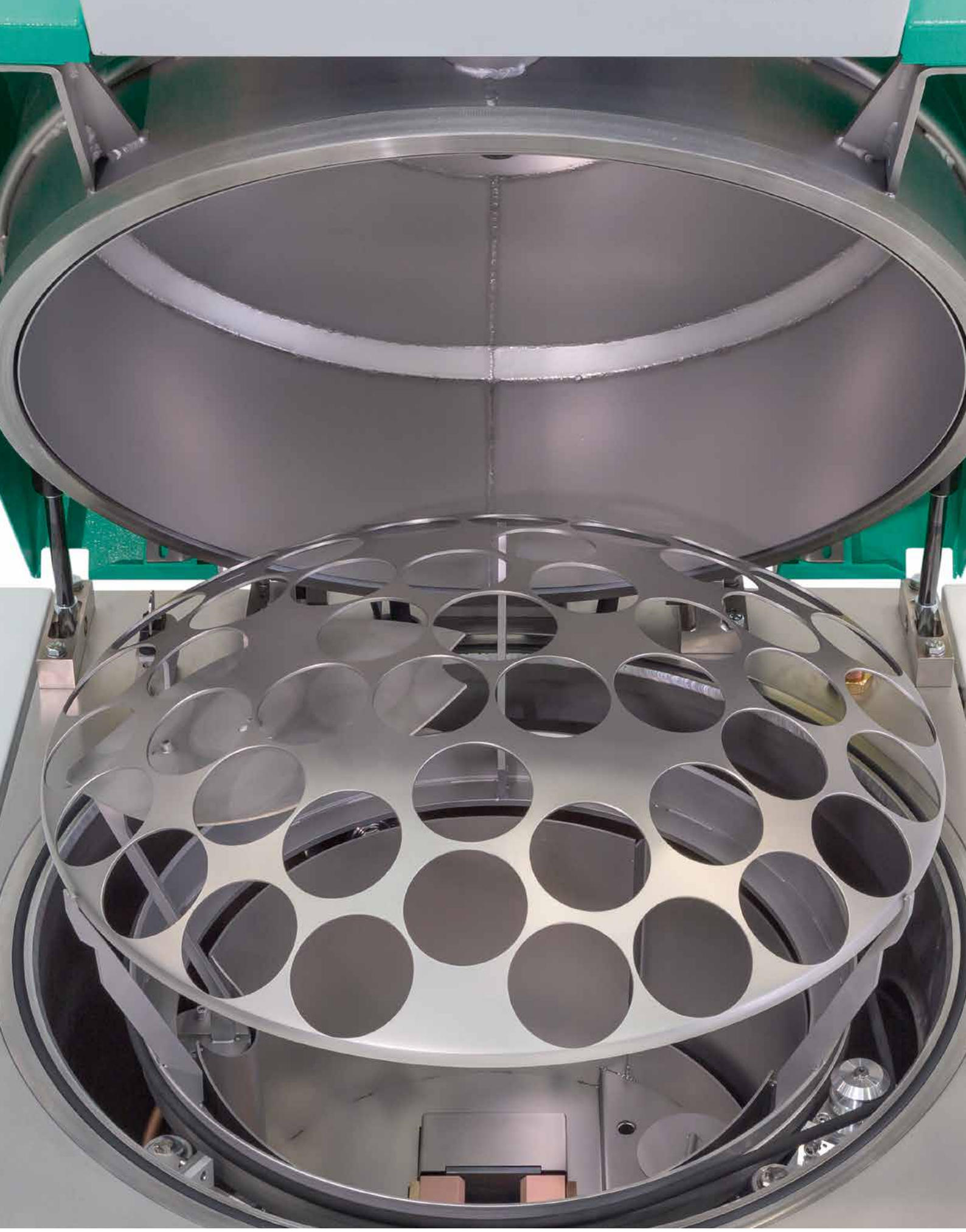
Technical data

		Boxer 700+ (Superior upgrade)		Boxer 900
Substrate holder		Flip-over	3-segment calotte	3-segment calotte
Loading capacity [pcs.]	Ø 65 mm	48	69	114
	Ø 70 mm	42	62	96
	Ø 75 mm	35	51	81
	Ø 80 mm	30	45	72
Process time	Single-side coated	40 min	40 min	30 min
	Both sides coated	70 min	80 min	65 min
Productivity Ø 70 mm / 8 h	**Single-side coated**	**252 pairs**	**372 pairs**	**768 pairs**
	Both sides coated	**126 pairs**	**186 pairs**	**384 pairs**
Dimensions	Chamber diameter	700 mm / 27.6”		900 mm / 35.4”
	Footprint	**5.8 m² / 63 sq. ft.**		**3.3 m² / 36 sq. ft.**
Components	Electron-beam gun	LEYBOLD OPTICS HPE 6		LEYBOLD OPTICS HPE 12/10
	Pre-vacuum pump	D65 B		2 x RA-100
	Roots pump	WS501		--
	Turbomolecular pump	HiPace 2300		HiPace 2300
	Ion source	Mark II+		Mark II+

BOXER 900







LEYBOLD OPTICS CCS series. (50 - 160 pairs / 8 h)
The unique modular coating platform.

LEYBOLD OPTICS CCS series –
the coaters that grow along with your business
Besides excellent AR processes, the LEYBOLD OPTICS CCS' unique modular concept enables you to start with a moderate initial investment, but without compromising on quality. Later, as production volume and variety increase, there is also no need to exchange the machine.

With Bühler Leybold Optics' carefully designed upgrade packages, the machine can grow along with your business – turning the system into a powerful and versatile tool for a mid-size laboratory.

Key benefits:
- One chamber size of 610 mm
- Unique concept for small to medium Rx laboratories
- Ergonomic top-loader design
- With flip-over system or full-dome
- Cylindrical chamber for quickest shield removal / cleaning

LEYBOLD OPTICS CCS series.
Keeping up with a growing business.

Automatic flip-over lens carrier

Full-dome for increase in loading capacity

Basic configuration

LEYBOLD OPTICS CCS 610
(54 - 78 pairs / 8 h)

- Ergonomic design for ease of operation
- Automatic flip-over lens carrier
- Electron-beam gun: LEYBOLD OPTICS HPE 6
- Ion source: Mark I
- Ion pre-clean (IPC)
- In-chamber hydrophobic coatings
- Turbomolecular pump: 1500 l/s (water-cooled)

Priority upgrade

LEYBOLD OPTICS CCS 610
(72 - 104 pairs / 8 h)

- Cryogenic-refrigeration system: Polycold
- Meissner trap
- Water chiller
- Ion-assisted deposition
- Process calibration

Superior upgrade

LEYBOLD OPTICS CCS 610+
(108 - 156 pairs / 8 h)

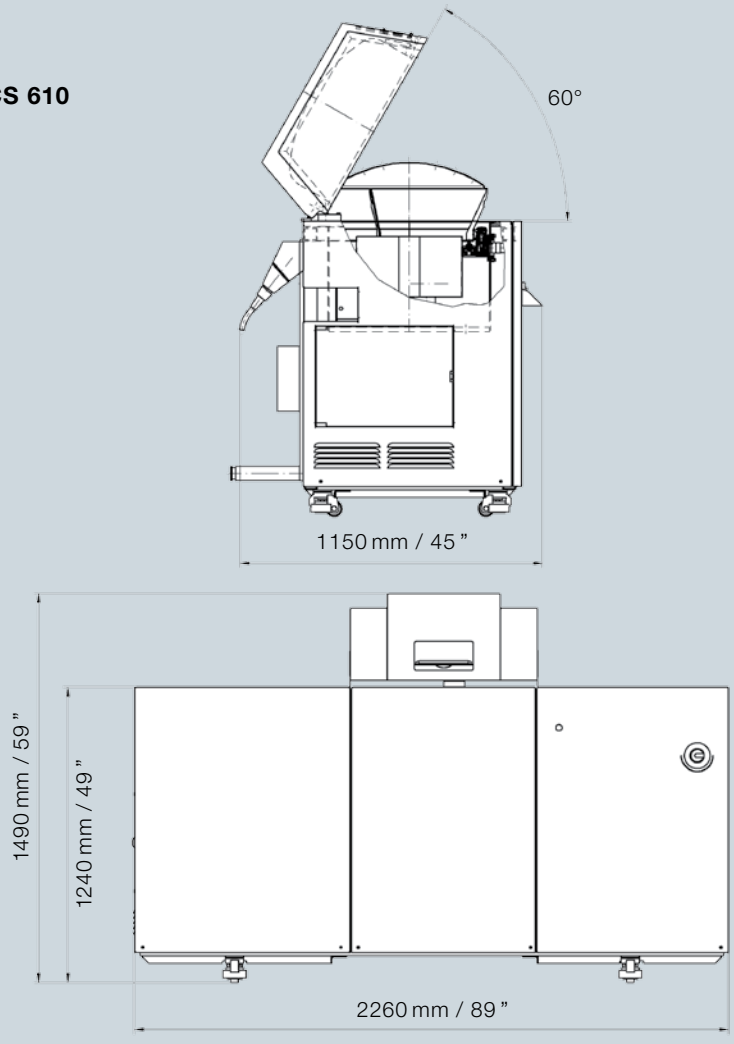
- Full-dome
- All components of basic configuration and 1st upgrade included
- Process calibration

In each upgrade step shown above, components for the LEYBOLD OPTICS CCS series are simply added or exchanged to expand your capacity without expanding the size or footprint of your laboratory. No other coating system offers this flexibility to grow coating capacity as demand increases.

Technical data

		LEYBOLD OPTICS CCS 610 (Basic configuration)	LEYBOLD OPTICS CCS 610 (Priority upgrade)	LEYBOLD OPTICS CCS 610+ (Superior upgrade)
Substrate holder		Flip-over	Flip-over	Full-dome
Loading capacity [pcs.]	Ø 65 mm	24	24	52
	Ø 70 mm	16	16	48
	Ø 75 mm	16	16	42
	Ø 80 mm	16	16	32
Process time	Single-side coated	--	--	35 min
	Both sides coated	65 - 70 min	50 - 55 min	80 min
Productivity Ø 70 mm / 8 h	**Single-side coated**	**112 pairs**	**144 pairs**	**288 pairs**
	Both sides coated	**56 pairs**	**72 pairs**	**144 pairs**
Components	Electron-beam gun	LEYBOLD OPTICS HPE 6	LEYBOLD OPTICS HPE 6	LEYBOLD OPTICS HPE 6
	Ion source	Mark I	Mark I	Mark I
	Pre-vacuum pump	D65 B	D65 B	D65 B
	Turbomolecular pump	HiPace 1500	HiPace 1500	HiPace 1500
	Cryogenic refrigerator	--	PFC 552	PFC 552

LEYBOLD OPTICS CCS 610



STAR 4/90. (32 - 40 pairs / 8 h)
Amazing opportunities from sputter technology.

Key benefits:

- Single-pair production
- AR-, absorption and mirror coatings from one silicon target
- High process stability and low particle contamination through:
  - sputter distance control
  - separate load-lock chamber
  - uninterrupted process vacuum
  - planetary system for 4 substrates
- Extremely small footprint (~1 m² / 11 sq.ft.)

Impressive coating speed

The STAR vacuum coater is a highly versatile tool that places retailers in a position to provide individually made Rx lenses for their customers in under an hour, including an AR coating on both sides. The chosen technology allows 2 pairs of lenses to be simultaneously coated from one side within 15 minutes – even if the machine has been entirely switched off.

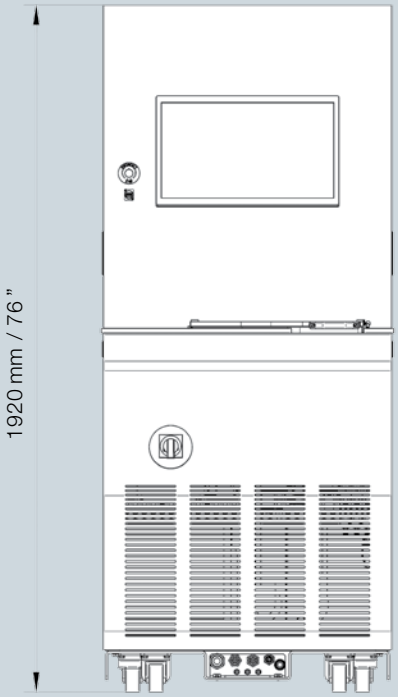
Outstanding ease of use

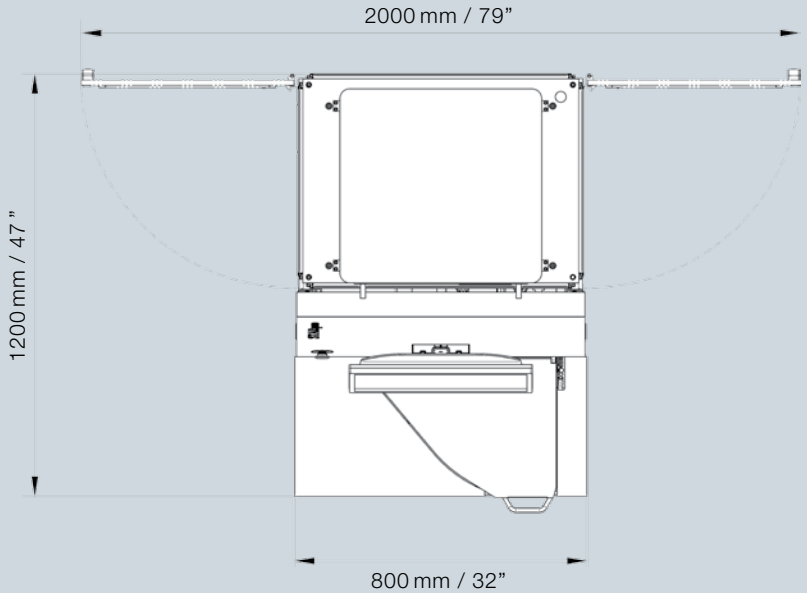
The capabilities of this vacuum coater makes it an ideal choice for retailers, wholesale Rx Labs, mirror coatings as well as for other special applications. The STAR needs interior cleaning and material refill after more than 1000 runs. In combination with its ease-of-use this coating machine can be operated by everyone with no need for special skills.

Technical data

General design features	STAR
Loading capacity [pcs.]	2 pair of lenses
Max. substrate Ø	80 mm / 3.15”
Process gas N_2, O_2, Ar	Incorporated
Remote access	LAN/WLAN/air card
Cycle time (4-layer AR)	10 min
Cathode	LEYBOLD OPTICS PK150
Sputter target	Silicon (Si)
Sputter power supply	DC pulsed
Sputter rate SiO_2	1.2 - 2.0 nm/s
Sputter rate Si_3N_4	0.7 - 1.2 nm/s

STAR





LEYBOLD OPTICS MCS 480. (25 - 60 pairs / 8 h)
The springboard optical lab system.

Key benefits:
- Ultra-compact platform
- Low entry cost
- In-house AR coatings
- Advanced technology
- Small footprint

LEYBOLD OPTICS MCS 480
The technology and experience of Bühler Leybold Optics is available in a compact machine that is very advanced and a perfect match for our equipment portfolio. The LEYBOLD OPTICS MCS 480 is designed for all lab sizes and particularly for smaller labs with low production volumes, but with a main focus on providing the best technology in AR treatments and fast delivery to their customers.

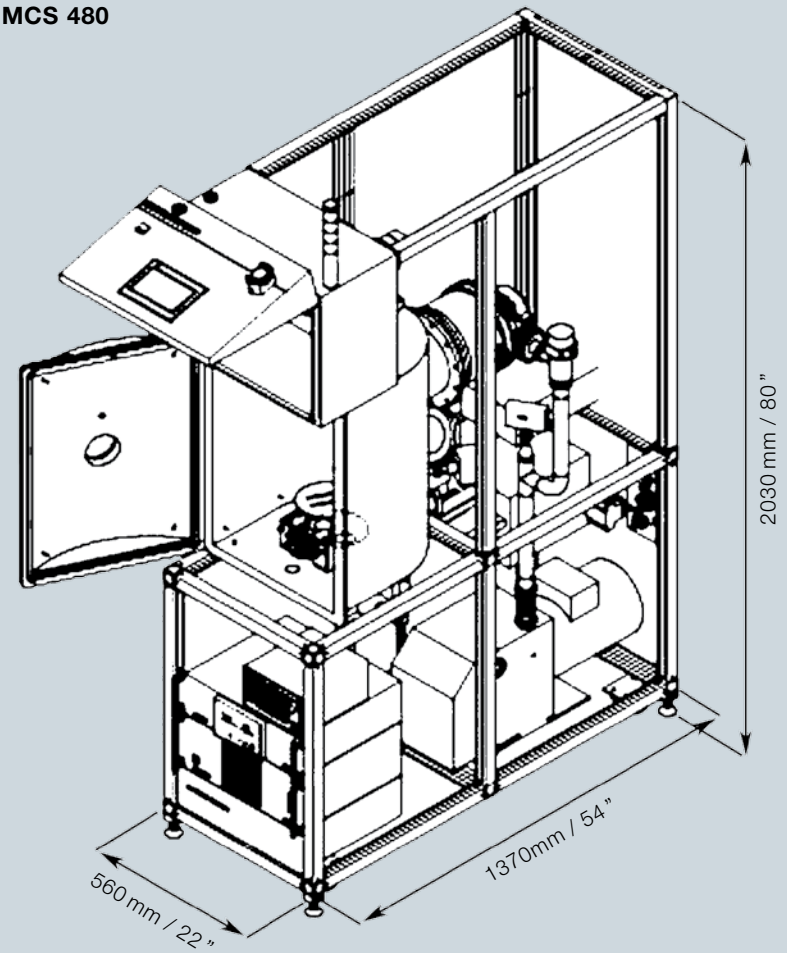
Compact solution that fits in small niches
The compact design of the LEYBOLD OPTICS MCS 480 makes this AR coater easy to install in labs of just 250 sq. ft. or less. Of course this coater can also be combined with Bühler Leybold Optics turnkey lab packages like MICRO LAB with either our spin- or dip-coating solutions.

Technical data

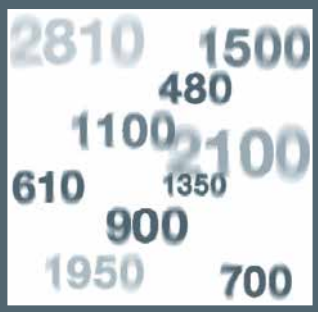
Loading capacity	Flip-over [pcs.]	Full-dome [pcs.]
Ø 65 mm	10	28
Ø 70 mm	10	26
Ø 75 mm	10	22
Ø 80 mm	10	18
Edged/shaped lenses	20	--

Components	
Electron-beam gun	LEYBOLD OPTICS HPE 6 (7 pockets)
Ion source	Mark I (in-chamber hydrophobic coatings)
Pre-vacuum pump	D65 B
High-vacuum pump	HiPace 1500
Thickness measuring	Quartz-crystal

LEYBOLD OPTICS MCS 480



Leybold Optics – components.
Assured productivity through high quality.



Chamber width


Pre-vacuum systems


High-vacuum systems


Vacuum measuring


Media supplies

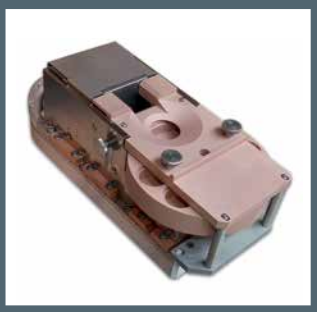

Refrigeration systems


Meissner traps


Substrate handling

■ Standard ■ Option	Chamber width							Pre-vacuum systems		High-vaccum systems		Vacuum measuring				Media supplies					Refrigeration systems			
	480 mm	610 mm	700 mm	900 mm	1100 mm	1350 mm	1500 mm	Rotary vane pump	Vane pump and roots blower	Diffusion pump	Turbomolecular pump	Pirani	Penning	Bayard-Alpert	RGA	CDA	Water cold	Water warm	Gases	Electricity	Leycool	Polycold	Telemark	
MCS	■							■			■	■	■	■	■	■	■		■	■	■			
CCS		■						■			■	■	■	■	■	■	■	■	■	■	■	■	■	
BOXER			■	■				■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	
SYRUS					■	■	■		■	■		■	■	■	■	■	■	■	■	■	■	■	■	
ACE			■			■			■	■		■	■	■	■	■	■	■	■	■	■	■	■	

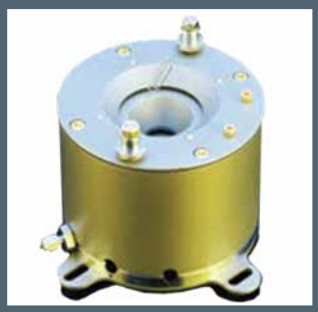
Heating systems



Electron-beam guns

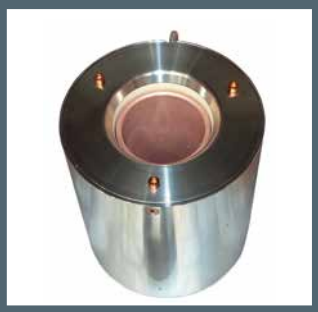
Thermal evaporators

Thickness measuring



Other ion sources

Lion ion sources



APS ion sources

PC systems

Meissner trap		Substrate handling			Heating systems		Electron-beam guns			Thermal evapo-rators		Thickness measuring			Other ion sources			Lion ion sources		APS ion sources		PC systems		
Shield type	Tube type	Full dome	Segmented dome	Flip-over	Degassing	Process support	HPE 6	HPE 12/10	HPE 12	Single boat	Top Coat	Single quartz	Double quartz	6-fold quartz	Mark I	Mark II	Mark II+	LION 100	LION 300	APS	APSprop	PC with HDD and UPS	PC with solid state drive	
■		■		■			■					■			■							■		
■		■		■			■					■			■							■		
	■	■	■	■	■	■	■	■		■	■		■	■	■	■	■					■	■	
■	■	■	■	■	■	■	■	■	■	■	■		■	■		■	■	■	■	■	■	■		
■		■	■		■	■	■	■	■	■	■		■	■		■	■					■		

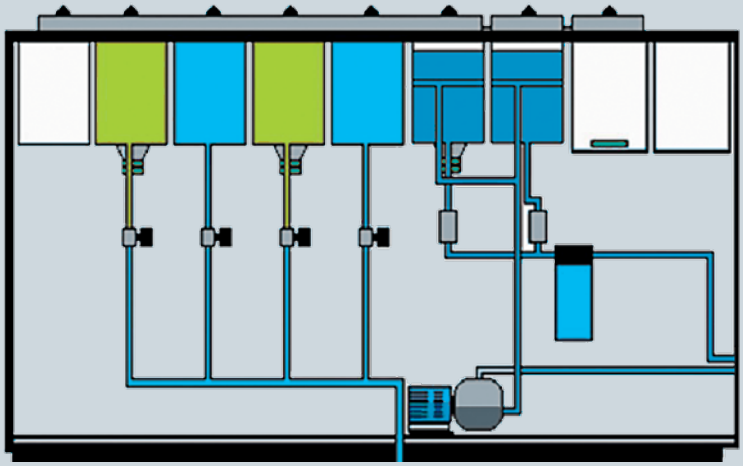
LEYBOLD OPTICS UCS series. (20 - 600 pairs / 8 h)
Ultrasonic cleaning systems.

LEYBOLD OPTICS UCS series

The main function of the system is to remove any kind of organic, chemical or mineral residue from the lens surface before starting the hard-coating process and AR treatment application. At the forefront of technology, these high-quality systems are tailored to your volume needs and investment level – a perfect match for your AR production.

Portfolio

LEYBOLD OPTICS UCS 20	up to 80 pairs / 8 h
LEYBOLD OPTICS UCS 40	up to 160 pairs / 8 h
LEYBOLD OPTICS UCS 60	up to 240 pairs / 8 h
LEYBOLD OPTICS UCS 120	up to 480 pairs / 8 h
LEYBOLD OPTICS UCS 150	up to 600 pairs / 8 h



LEYBOLD OPTICS UCS 60

Electrical supply	**240 V, 1 phase, 20 A, 50/60 Hz**
Number of tanks	**7**
Step 1	Washing (special detergent)
Step 2	Rinsing
Step 3	Washing (special detergent)
Step 4	Rinsing
Step 5	Rinsing (deionized water)
Step 6	Rinsing (deionized water)
Step 7	IR dry
Overall size	**1500 mm x 750 mm x 1050 mm**
Productivity	**240 pairs / 8 h**
Displacement	**Automatic cycle**

LEYBOLD OPTICS CHC series. (20 - 600 pairs / 8 h)
Ultrasonic cleaning and hard-coating systems.

LEYBOLD OPTICS CHC series

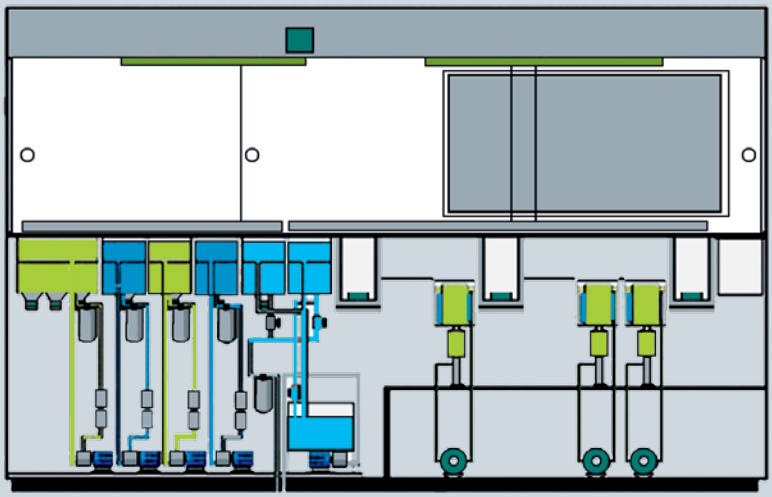
The tools of the LEYBOLD OPTICS CHC series accurately handle two process steps within one machine – ultrasonic cleaning and hard-coating. These devices can be used for most commercial substrates, such as CR-39, index 1.60 material, index 1.70 material and polycarbonate, and will provide the best preparation for these substrates. A dedicated control system ensures that high quality is maintained.

Portfolio

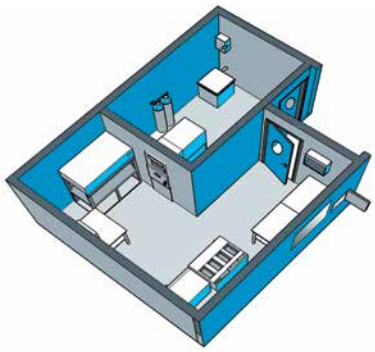
LEYBOLD OPTICS CHC 20	up to 80 pairs / 8 h (1.75 l lacquer/tank)
LEYBOLD OPTICS CHC 60	up to 240 pairs / 8 h (3.0 l lacquer/tank)
LEYBOLD OPTICS CHC 150	up to 600 pairs / 8 h (5.5 l lacquer/tank)

LEYBOLD OPTICS CHC 60

Electrical supply	**400 V, 3-phase, 20 A, 50/60 Hz**
Capacity	**4 - 5 l**
Lenses per carrier	**3 pairs**
Step 1	Cleaning (ultrasonic)
Step 2	Rinsing
Step 3	Cleaning (ultrasonic)
Step 4	Rinsing
Step 5	Rinsing (deionized water)
Step 6	Rinsing (deionized water)
Step 7	IR heating (radiant)
Step 8	Cooling
Step 9	Lacquering
Step 10	Thermal drying (primer)
Step 11	Cooling
Step 12	Pre-curing (oven)
Overall size (mm)	**2650 mm x 1000 mm x 2500 mm**
Productivity	**240 pairs per 8 h**
Displacement	**Automatic cycle**



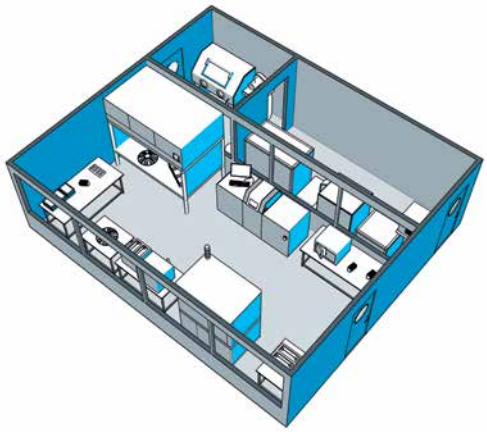
Leybold Optics – lab solutions.
Turnkey installations for Rx lens production.



MICRO LAB.

250 sq. ft. / 25 m² (AR and spin coating)

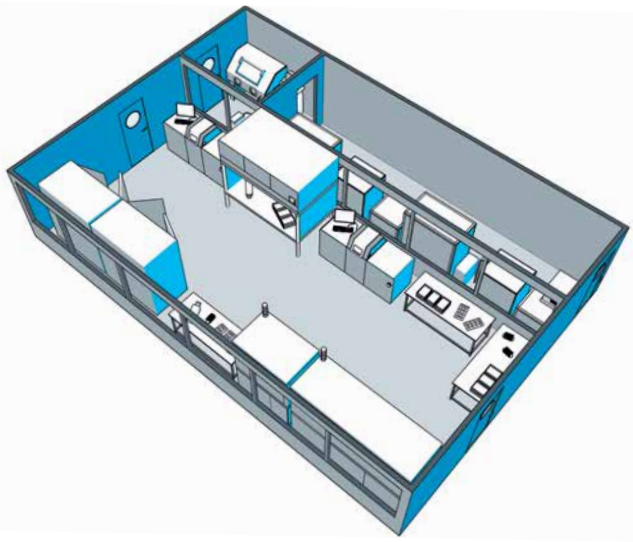
MICRO LAB is the smaller entry-level choice available for anti-reflection equipment. The LEYBOLD OPTICS MCS can be combined with hard- or spin-coating systems and is a perfect solution for small labs.



MINI LAB.

350 sq. ft. / 35 m² (AR and spin coating)

MINI LAB is the entry-level choice. It comes equipped with an anti-reflection coating system of the LEYBOLD OPTICS CCS series and hard-coating device that uses back-side spin coating.



EASY LAB.

480 sq. ft. / 50 m² (AR and dip coating)

EASY LAB is a more advanced choice. It comes equipped with an anti-reflection coater either from the LEYBOLD OPTICS CCS or the BOXER series. The higher productivity allows for hard-coating application via dip coating.

Productivity Overview

System	Capacity	Hard-coating system
MICRO LAB	up to 50 pairs / 8h	Spinning
MINI LAB	up to 200 pairs / 8h	Spinning
EASY LAB	up to 950 pairs / 8h	Dipping

Features and benefits:

- Easy and comfortable machine handling and operation
- Properietary and high-quality processes
- Easy access to components and instruments
- Easy system maintenance
- Small footprint
- Short pump-down time to process start-pressure
- Modification of process parameters according to customer specification
- Multi-layer anti-reflection coatings
- Hydrophobic and superhydrophobic coatings
- Organic and mineral lenses
- Remote analysis and data logging

Bühler Leybold Optics process support

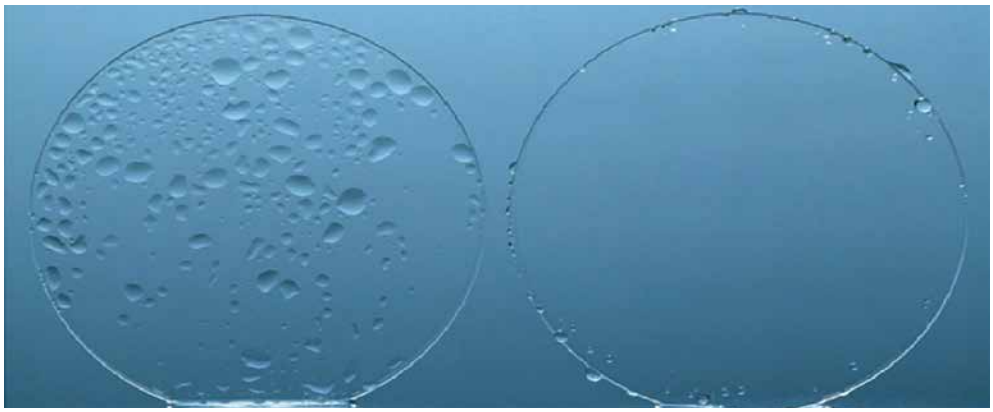
A brief site inspection enables us to offer the optimum lab setup for your individual business case. However, this support does not end with the installation of the equipment.

With a large variety of proprietary AR coating processes on hand and our skills in process know-how and quality inspection, we will support your production ramp-up, provide training on all machines delivered and we will be your partner for when you need to further develop your coating plant.

Recommended lab setups

	Micro Lab	Mini Lab	Easy Lab
Inspection prior to loading before coating		■	■
Tool cleaning			■
Automated ultrasonic cleaning system (UCS)	■	■	
Automated ultrasonic cleaning and hard-coating system (CHC)			■
Unloading inspection prior to curing			■
Curing and/or degassing oven	■	■	■
Clean-air flow bench with ionizing-air gun	■	■	■
Warm-water system	■	■	■
Electrical transformer	■	■	■
Polycold cryogenic-refrigeration system with Meissner trap		■	■
Water chiller	■	■	■
Stripping unit			■
Final quality inspection	■	■	■
Air compressor	■	■	■
Air dryer	■	■	■
Bead (sand) blaster	■	■	■

Leybold Optics processes.
Highest quality AR coatings to meet any requirement.



With the upgradeable LEYBOLD OPTICS CCS, the versatile BOXER or the SYRUS vacuum coater included in MINI LAB or EASY LAB, your coating center will have all of the tools necessary to produce the highest quality coatings.

Process availability on coaters

		STAR	**MCS**	**CCS 610** Basic	**CCS 610** Priority upgrade	**CCS 610+** Superior upgrade	**Boxer** 700 Basic	**Boxer** 700+/900 Superior upgrade	**Syrus**
AR	EMERALD	■							
	JADE PLUS		■	■			■		
	BRILLIANT		■		■	■		■	■
	OPTIFLEX				■	■		■	■
	EMINENT*					■		■	■
Hydro	KINGCLEAN		■	■	■	■	■	■	■
	SUPERCLEAN		■	■	■	■	■	■	■
Mirror	OBSIDIAN	■							
	TIGER'S EYE			■			■		
	OPAL		■		■	■		■	■
	TOPAZ		■		■	■		■	■

* requires ion-source Mark II+

Process characteristics

Process	**Reflectance**	**Color**	**Method**	**Process advantages**
EMERALD	~ 1.1 %	Green, blue and gold	Sputter	Fastest process, ideal for single-pair production
JADE PLUS	~ 1.1 %	Green	IPC	Developed for smallest chamber sizes
BRILLIANT	~ 1.0 %	Green, blue and gold	IPC	For high abrasion (Bayer) ratios without ion assistance
OPTIFLEX	~ 0.9 %	Green, blue and gold	IPC, IAD	Optimized for short batch times and low reflectance
EMINENT	~ 0.8 %	Green	IPC, IAD	Premium coating with highest Bayer ratios and antistatic function

– All processes are suitable for spin- or dip-hard-coated lenses or in-mould lenses
– BRILLIANT and OPTIFLEX can be upgraded with antistatic layer EMIXX
– All processes can be installed with hydrophobic or superhydrophobic coatings

AR testing services and kits.

Lens test kit
Do-it-yourself lens test kit

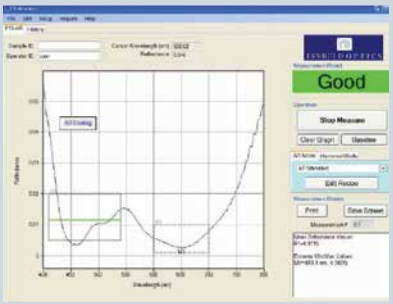
Perform quality testing in-house, detailed easy-to-follow instruction manual, showing you how to carry out the tests and how to log the results. The kit comes with everything you need to get started and includes on-site training.

Kit includes the following tests:

- T1 Optical impression
- T2 Reflection color
- T3 Crosshatch tape test
- T6 Basic eraser abrasion test
- T8 Saltwater boil test
- T9 Temperature test

AR color and hard-coat
Thickness measurement kit

Maintain your quality inspection by checking the AR reflection color spectrally and minimize returns by checking your hard-coat thickness.

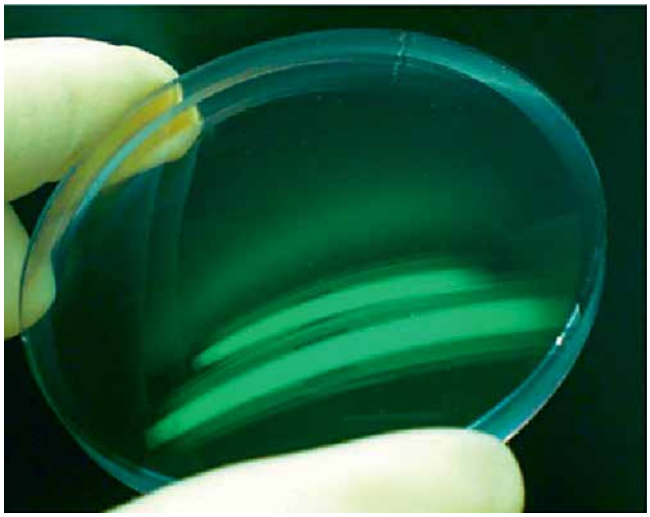


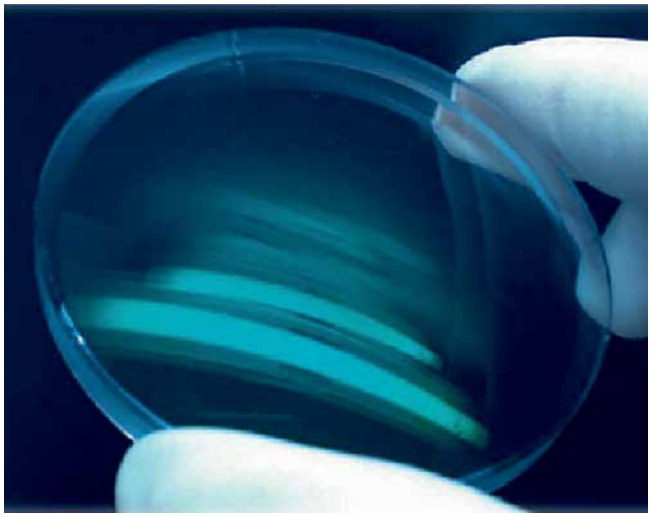
Kit contains:

- F10AR/HC spectrophotometer
- Easy to use QC software
- Laptop computer pre-configured and ready-to-go

Other services

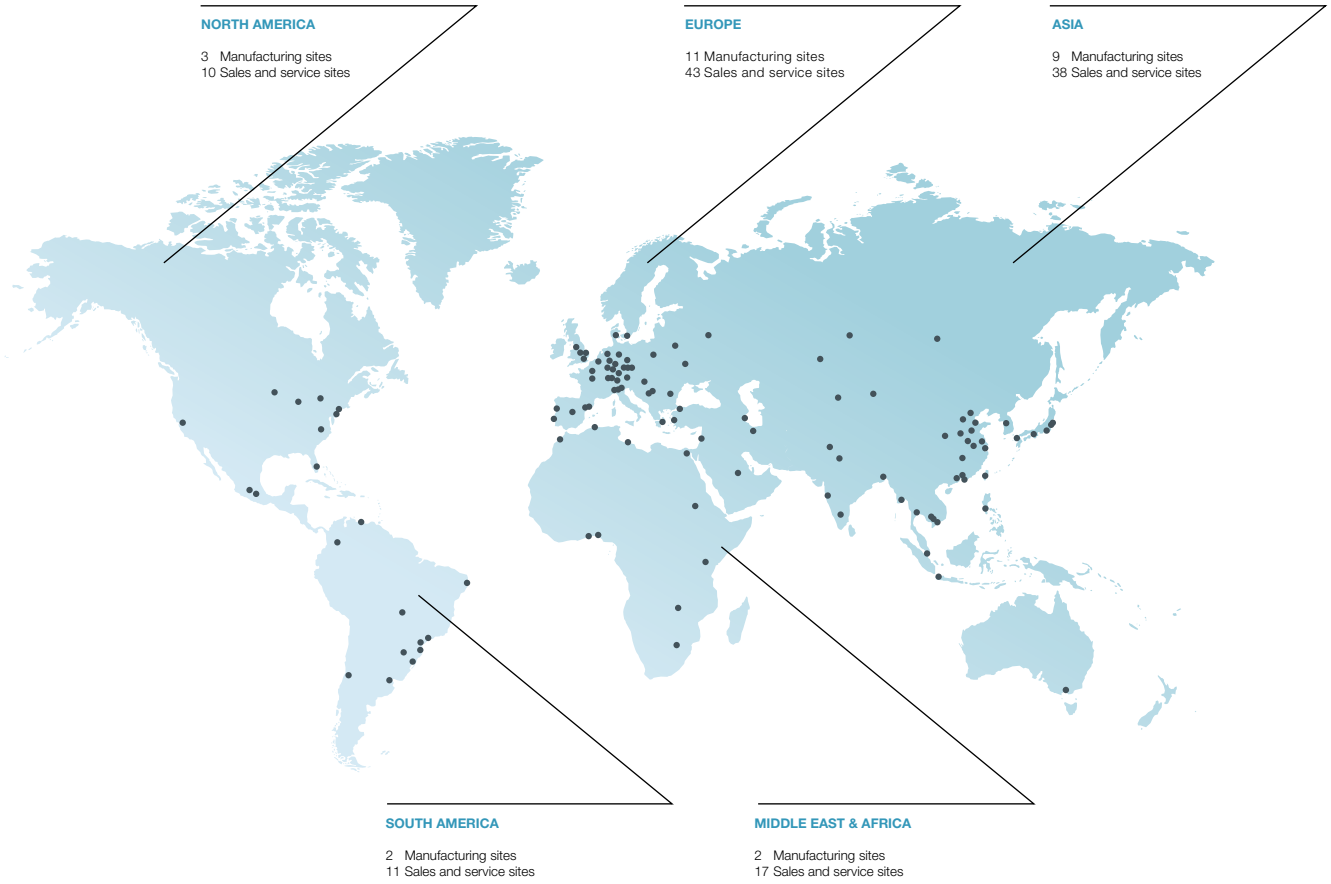
- **Annual lens testing contract**
- **Emergency testing**
- **Additional lens test training**





Customer support and services.
Always on hand to sustain your business.

Global presence of Bühler



Bühler Leybold Optics' relationship with its customers does not end once the machines start production — it is a continuation and an extension of a close partnership. Wherever Bühler Leybold Optics machines are, one of the worldwide centers of competence is close to your site. The company therefore ensures that you receive the right support so that your machines deliver perfect product quality and benefit from high uptime.

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. Contact information for Bühler's worldwide services can be found on the company's homepage: www.buhlergroup.com.

Bühler Leybold Optics' service commitment to customers guarantees fast identification of parts, components or consumables, tracked and logged to ensure readiness for shipment within one day so that fast delivery to any country in the world is possible.

Bühler is a specialist and technology partner for ophthalmic optics coating solutions. With its expertise and over 150 years of experience, Bühler continuously rolls out unique and innovative solutions for its customers, helping them achieve success in the marketplace. The Bühler Group operates in more than 140 countries and has a global payroll of over 10,000.

HELPDESK

- Always available during German, US and Asian business hours: contact the Helpdesk of your local service or at headquarters. The phone numbers are:
  EUROPE: +49 6023 500 777 (or +41 71 955 1900)
  USA: +1 919 657 7100
  CHINA: +86 (10) 67803366-537
- Problems are analyzed promptly via remote diagnosis

FITNESS CHECK

Preventive maintenance and inspection

- Full check of all machine functions
- Comprehensive, customer-specific maintenance service for continued optimal productivity and cost savings when repairs are needed
- Monitoring of the maintenance cycle allows timely appointment scheduling

FLEXCARE / TOTALCARE

Customer service and consultation

- Flexible and adapted to your needs, these service contracts consist of an annual contingency allowance of hours, selectable in different packages – BRONZE, SILVER and GOLD
- Qualified service engineers worldwide
- Quick response times through local resources and close cooperation with suppliers

REPLACEMENT PARTS AND ACCESSORIES

- Worldwide replacement-part-management network, shipment of main parts in one day
- Guaranteed original parts for safe production and highest uptime
- Proven quality for accessories for best qualitative products
- The parts are manufactured by Bühler Leybold Optics or by first-class material specialists like UMICORE with highest availability

RENOVATION OF MACHINES AND ASSEMBLIES

- Software optimization
- PLC and HMI exchange
- Full exchange of electric cabinet and PLC and HMI exchange
- Improved cycle times
- For Leybold Optics products and other machines

OVERHAUL AND UPGRADES

- Upgrade to new components
- Machine extensions
- Improved performance and longer equipment life
- Used machines with «buy back option» for all Leybold Optics products and other machines

RELOCATION OF MACHINES

- Relocation of one machine or a full production site to another production location
- From an ophthalmic coater to a full production lab

TRAINING

Thoroughly trained and motivated personnel will raise the quality standard that you achieve in utilizing Bühler equipment and will ensure your long-term success. Would you like to increase your employees' level of training to the latest standards in maintenance and operations? To achieve this, Bühler offers you various training courses in a specialized Training Center. In a group of five persons and more, training can be tailored to specific requirements.

- Safety and regulations
- Basics of vacuum technology
- Basics of coating tools
- Basic theoretical training in equipment and technology
- Practical training in preventive maintenance
- Practical training in machine operation
- In-depth training on EB-Gun, Ion source, optical or physical measurement units and process analysis, leak detection, etc.

Bühler Alzenau GmbH
Business Area Leybold Optics
Siemensstrasse 88
63755 Alzenau
Germany
T +49 6023 500 0
F +49 6023 500 150
leyboldoptics@buhlergroup.com
www.buhlergroup.com