Ultrasonics.Steam.Ultraclean.

Optics

Ultrasonic technology for fine and ultra-fine cleaning

of precision-, micro- und infrared optics

- Modular ultrasonic cleaning lines
  for ready-for-control and -coating as well as ready-for-remuneration and -assembly cleaning
- Extensive range of accessories and suitable ancillaries
- Ultrasonic cleaning devices with modern multi-frequency technology
- Elma Clean cleaning chemistry optimized for the cleaning of optics

A clear view with sophisticated ultrasonic technology

Customer requirements

Stage of cleaning process (ready-for-inspection and/or ready-for-coating cleaning)

Cleaning process for the glass types has already been established

Cleaning process for the glass types has not yet been established

Anlagen

Elma configures the suitable cleaning line or device based on the required process (aqueous, semi-aqueous or in combination with solvents) and depending on the required throughput.

Processes using Elma chemicals

In the Elma application laboratory our engineers cooperate with the customer to establish the individual cleaning process using Elma chemicals.

The advantages of the Elma cleaning technology:

- **Validatable** cleaning lines and units for different glass types and depending on through put requirements
- Ultrasound with multi-frequency technology
- Measuring systems for quality control and process optimization
- Application laboratory for the perfect cleaning process
- Cleaning chemicals developed and made by Elma
- After Sales Service in Europe, the USA and Asia

Example of customer-specific ultrasonic cleaning line for precision optics:

Elma STC 300/300/400/10

Robot device for the cleaning ready-for-coating - Lenses for endoscopes

- Pollution: Dust, fingerprints, residues of protective lacquers
- Cleaning result: Final cleaning before assembly
- Process: Semi-aqueous based system with centrifugal drying
- Cleaning chemicals: NEP and Elma Clean products
- Throughput: 10 batches/day
- Transport: Robot with rotation drive
- Periphery: Clean water circulation equipment
- Machine specialty: Transport robot with rotation drive for the transportation of disc carriers through the process chambers rsp. for the drying of the products by centrifugal technology

Elma STC robot systems and Elma MTC lift and push installations

Cleaning systems made to measure

Both Elma STC and Elma MTC systems are available in 5 tank sizes. They are designed to meet high cleanliness requirements at high throughput.

- Cleaning processes include a great number of individually selectable options to meet cleaning requirements, materials and parts to be cleaned
- Various different drying systems are available (hot air, continuous flow, infra-red or vacuum dryers)
- Systems are easily expandable with suitable accessories and ancillaries (loading and unloading conveyors, wet loading tanks, etc.)
- Optional bath care ancillaries (filter pump systems, oil separators, pure water systems)
- Process-controlled production through data-logger and sensors with calibration certificates for validated, consistent product quality
- Industrial-PC control with intuitive visualization
- Remote control and maintenance options
- Optional connection to MES or customer IT-systems
- Optional use of barcode/data-matrix code-scanners or RFID-systems

Customised Cleaning Systems

In close cooperation with our customers, we develop and provide tailor-cut cleaning solutions. We support our customers from cleaning tests in our process laboratory, to the development and design of individual cleaning processes and cleaning systems to system implementation and subsequent maintenance and servicing.

With Elma systems, customized and standardized cleaning solutions go hand in hand. Standardized ancillaries such as oil separators for extending the bath service life, filter pump devices or water processing units can be easily integrated into your cleaning system to meet even changed requirements.

Manual or semi-automatic ultrasonic cleaning systems

Our modular concept consists of standardized components from ultrasound equipment, transport systems and enclosures to ancillary devices.

For smaller quantities, a manual system, X-tra line, is the most suitable. If the system capacity is too small, it can be extended at any time thanks to the modular design, or supplemented by various ancillaries.

Thus these modular systems are easily and quickly upgradeable in response to changed cleaning requirements.

Manual 2-chamber-system with oscillation

- Multi-frequency technology with 25/45 or 37/130 kHz
- Sweep-function for optimal cleaning results
- Degas-function
  for quick degassing, esp. of a fresh cleaning bath
- Individually activatable Pulse-function
  for increased performance with difficult cleaning tasks
- For fine and ultra-fine cleaning as „precision" version
  with rounded tank corners, electropolished surfaces and special pipework
- Optional side-ultrasound technology
  for special component geometry
- Different drying systems for different material requirements
- Compact system design
  for an easy integration into existing production processes
- Optional accessories as baskets, covers or rinse stations
- Integrated ancillaries such as filters, oil separators, etc.
- Extremely service and maintenance friendly thanks to the compact system design with easily accessible and swiftly replaceable components
- Highly cost-efficient cleaning line concept

xtra line 4-SEMI with loading and unloading station

Fully-automated and optionally enclosed ultrasonic cleaning systems

Designed for fine and ultra-fine presicion optics cleaning tasks, the X-tra line can be flexibly deployed and extended due to the modular system concept at any time.

The modular cleaning systems are equipped with multi-frequency with 25/45 or 37/130 kHz. Different tank sizes can even be easily accommodated in one system, so that individualised systems are conceptualised. As „precision" version for fine cleaning tasks, the tanks are made of electropolished surfaces, round tank corners and special piping.

The compact system design enables easy system maintenance. Ancillaries for bath care, such as oil separators, filter units or similar, are positioned next to the system in order to save space.

All cleaning lines are ready for extensions at any time and a wide range of accessories like baskets, etc. is available. Accessories and ancillaries may also be added later on to adapt the system to changed production requirements.

4-chamber-cleaning system with PLC, loading and unloading station, oscillation device and transport robot

- Optional equipped with lateral ultrasound technology
- Individually activatable Pulse-, Sweep- and Degas-functions
- As „precision" version with rounded tank corners, electropolished tank surfaces and specially designed piping for optimised drainage and to prevent entrainments
- Process-controlled production due to data-logger as well as OEE, trend analysis and energy management
- Optional use of manual or automatic barcode/data-matrix code scanners or RFID-systems
- Automated systems have a weekly time switch for starting and shutting down the system automatically
- Cascaded, connected cleaning tanks for multiple use of water and to reduce water consumption
- Connection to MES or customer IT-systems possible
- Touch panel with a user-friendly visualization and IPC-controlled surface

X-tra line with housing and laminar-flow units in order to meet highest cleaning requirements, for noise reduction and as interface to clean rooms.

Smart accessories and ancillaries

Customer-specific baskets and inserts

Depending on requirements and cleaning tasks, there are

- Standardized and
- Customised options.

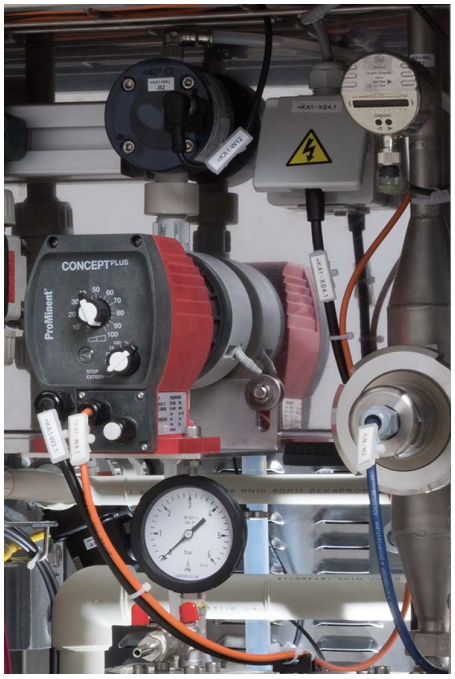
Bath care systems

- Oil seperators
- Filter pump units for surface or bottom skimming

Water treatment systems

- Systems for water softening
- Re-osmosis systems
- Demineralised water circuit systems

Automatic dosing units



For the dosage of the cleaning agents

- Volumetric
- Guide value-based
- Based on the measurement of surfactants

Rotation units

For cleaning micro optics with

- Lift rotation or
- Horizontal rotation.

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Elma Clean cleaning chemicals for precision optics

	Application	Parts material	Contamination	Preceding process step	pH-value and concentration
Frameless optics / mineral glass optics*1 - Ready-for-inspection cleaning					
EC 275 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Glass types insensitive to alkaline media.	Residues of colophonium-based protective laquer, putty and pitch, grinding and polishing residues, fingerprints, dust.	Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives.	pH: 12 - 12.7 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5 - 1%, >55°C
EC 270 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Glass types moderately sensitive to alkaline media.	Traces of colophonium-based protective laquer and putty, grinding and polishing residues, fingerprints, dust.	Solvent-based removal of protective laquer, putty and adhesives.	pH: 9 - 10 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5 - 1%, >55°C
EC 260 d&s	For ultrasonic, dip and splash cleaning; predominantly demulsifying.	Also glass types very sensitive to alkaline media.	Traces of colophonium-based protective laquer and putty, grinding and polishing residues, lime soaps, fingerprints, dust.	Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives.	pH: 7 - 8 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5 - 1%, >55°C
EC 290 tf (surfactant-free)	For the surfactant-free dip and splash cleaning; demulsifying.	Glass types moderately sensitive to alkaline media.	Grinding and polishing residues, lime soaps, fingerprints, dust.	Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives.	pH: ~11 0.5 - 2%
Frameless optics / mineral glass optics - Ready-for-coating cleaning					
EC 275 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Glass types insensitive to alkaline media.	Dirt after storage, fingerprints, dust.	Ready-for-coating cleaning	pH: 12 - 12.7 ultrasonic/dip: ~1%, splash cleaning: ~0.5%, >55°C
EC 270 d&s	For ultrasonic dip- and splash-cleaning, KOH-based; predominantly demulsifying.	Glass types moderately sensitive to alkaline media.	Dirt after storage, lime soaps (drying spots), fingerprints, dust.		pH: 9 - 10 ultrasonic/dip: ~1%, splash cleaning: ~0.5%, >55°C
EC 260 d&s	For ultrasonic, dip and splash cleaning; predominantly demulsifying.	Also glass types very sensitive to alkaline media.	Dirt after storage, lime soaps (drying spots), fingerprints, dust.		pH: 7 - 8 ultrasonic/dip: ~1%, splash cleaning: ~0.5%, >55°C

*1 If a given mineral glass could be cleaned in aqueous media or not, depends on its chemical resistances to pure water (DI-water rinsing steps) and to the alkaline or acidic cleaning solutions. These are given e. g. by their Schott-indexes against acidic (SR, ISO 8424:1987) and alkaline (AR, ISO 10629: 1996) aqueous media and other indexes. Thus, e. g. a mineral glass with SR >~ 52,2 requires special measures for the rinsing with deionized water (temperatures < 20°C a. s. o.) or this glass can not be rinsed in deionized water at all. The coefficient of thermal expansion of the glass has to be considered for DT-jumps between processing steps.

Frameless optics / infrared optics - Ready-for-inspection cleaning					
EC 275 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Ge, CaF_2	Grinding and polishing residues, storage dirt, fingerprints, dust.	Solvent-based removal of protective laquer, pitch and putty.	pH: 12 - 12.7 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5 - 1%, >55°C
EC 270 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Si*2 , other glass types moderately sensitive to alkaline media.	Traces of colophonium-based protective laquer and putty, grinding and polishing residues, fingerprints, dust.		pH: 9 - 10 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5 - 1%, >55°C
EC 260 d&s	For ultrasonic, dip and splash cleaning; predominantly demulsifying.	Al*3, Cu/Ni*3, Ge, Si, SnS(Cleartran), ZnSe, AMTIR, CaF_2	Traces of colophonium-based protective laquer and putty, grinding and polishing residues, lime soaps, fingerprints, dust.		pH: 7 - 8 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5 - 1%, >55°C
Frameless optics / infrared optics - Ready-for-coating cleaning					
EC 275 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Ge, CaF_2	Dirt after storage, fingerprints, dust.	Ready-for-coating cleaning	pH: 12 - 12.7 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5%, >55°C
EC 270 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Si *2 , other glass types moderately sensitive to alkaline media.	Fingerprints, dust.		pH: 9 - 10 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5%, >55°C
EC 260 d&s	For ultrasonic, dip and splash cleaning; predominantly demulsifying.	Al*3, Cu/Ni*3, Ge, Si, SnS(Cleartran), ZnSe, AMTIR, CaF_2	Dirt after storage, lime soaps (drying spots), fingerprints, dust.		pH: 7 - 8 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5%, >55°C

*2 An alkaline cleaning of Si-elements includes etching. This should be restricted by limiting the dipping time to a thinning of the outermost SiO2-layer only.
*3 Ultrasonic treatment of Aluminium-mirrors requires higher ultrasonic frequencies and restricted ultrasonic power. For Cu/Ni-mirrors this holds also, but to a lower extent.

Framed optics / optical components / mineral glass optics - Ready-for-assembling cleaning					
EC 275 d&s	For ultrasonic, dip and splash cleaning; KOH-based, predominantly demulsifying.	Frames and glass types insensitive to alkaline media.	Residues of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust.	Framing, preassembling with cleaned elements, sticking.	pH: 12 - 12.7 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5%, >55°C
EC 225 sonic	For ultrasonic and dip cleaning; emulsifying.	Also glass types and frames sensitive to alkaline media.	Traces of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust.		pH: 9 - 10 ultrasonic/dip: 2 - 10%
EC 225 spray	For splash cleaning; emulsifying.	Also glass types and frames sensitive to alkaline media.	Traces of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust.		pH: 9 - 10 splash cleaning: 1 - 3%, >55°C
EC 260 d&s	For ultrasonic, dip and splash cleaning; predominantly demulsifying.	Glass types and frames very sensitive to alkaline media.	Traces of adhesive (not cured), lime soaps, fingerprints, dust.		pH: 7 - 8 ultrasonic/dip: 1 - 2%, splash cleaning: 0.5%, >55°C
EC 290 ts (surfactant-free)	For surfactant-free dip and splash cleaning; demulsifying.	Glass types and frames insensitive to alkaline media.	Lime soaps, fingerprints, dust.		pH: ~11 0.5 - 2%

About us

Ultrasonic Cleaning Technology · Cleaning Chemistry · Process Laboratory

Perfect cleaning results and high quality products are the measure of all things. With the large and thought-out product range, Elma is offering sophisticated solutions for cleaning tasks for precision-, micro, and infrared-optics.

Ultrasonic and steam cleaning technologies are our core competencies and our process lab develops detailed cleaning processes for even the most difficult cleaning tasks. Thus we provide competent and reliable advice and tailor-cut cleaning solutions to our customers.

Furthermore we provide top quality in all manufacturing stages from design and development to service and after-sales-service.

Our process laboratory develops for optic applications optimized cleaning agents which are produced in our plant.

A worldwide network of partners and distributors ensures high availability of equipment and systems with short response times.

Years of experience in industrial precision cleaning, innovative research and development make us the partner of choice for you. We consider trust and reliability to be the foundation of a sustainable partnership.

By providing you with Elma products and services, we want to contribute to your success as reliable, competent partner!

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