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

www.elma-ultrasonic.com
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 throughput 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

- 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

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.
Fully-automated and optionally enclosed ultrasonic cleaning systems

Designed for fine and ultra-fine precision 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.

- 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 separators
- 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.
## Elma Clean cleaning chemicals for precision optics

### Frameless optics / Mineral Glass Optics - Ready-for-coating Cleaning

<table>
<thead>
<tr>
<th>Application</th>
<th>Parts Material</th>
<th>Contamination</th>
<th>Preceding Process Step</th>
<th>pH-Value and Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC 275 dls</strong></td>
<td>For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying.</td>
<td>Glass types insensitive to alkaline media.</td>
<td>Residues of colophonium-based protective laquer, putty and pitch, grinding and polishing residues, fingerprints, dust.</td>
<td>Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives.</td>
</tr>
<tr>
<td><strong>EC 270 dls</strong></td>
<td>For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying.</td>
<td>Glass types moderately sensitive to alkaline media.</td>
<td>Traces of colophonium-based protective laquer and putty, grinding and polishing residues, fingerprints, dust.</td>
<td>Solvent-based removal of protective laquer and putty adhesives.</td>
</tr>
<tr>
<td><strong>EC 270 dls</strong></td>
<td>For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying.</td>
<td>Also glass types very sensitive to alkaline media.</td>
<td>Traces of colophonium-based protective laquer and putty, grinding and polishing residues, lime soaps, fingerprints, dust.</td>
<td>Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives.</td>
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<td>Grinding and polishing residues, lime soaps, fingerprints, dust.</td>
<td>Solvent-based removal of protective laquer, putty and pitch (if necessary) adhesives.</td>
</tr>
</tbody>
</table>

### Frameless optics / Mineral Glass Optics - Ready-for-Inspection Cleaning

| **EC 290 tf** (surfactant-free) | For the surfactant-free dip and splash cleaning; demulsifying. | Glass types moderately sensitive to alkaline media. | | |

### Framework optics / Infrared Optics - Ready-for-Inspection Cleaning

| **EC 275 dls** | For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying. | Ge, CaF<sub>2</sub>, SnS (Cleartran), ZnSe, AMTIR, CaF<sub>2</sub> | Residues of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust. | Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives. |
| **EC 270 dls** | For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying. | Si<sup>2+</sup>, Si, Si<sub>5</sub>S<sub>3</sub>, Si<sub>5</sub>Te<sub>2</sub>, AMTIR, CaF<sub>2</sub> | Traces of colophonium-based protective laquer and putty, grinding and polishing residues, lime soaps, fingerprints, dust. | Solvent-based removal of protective laquer and putty adhesives. |
| **EC 260 dls** | For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying. | Si<sup>2+</sup>, Si, Si<sub>5</sub>S<sub>3</sub>, Si<sub>5</sub>Te<sub>2</sub>, AMTIR, CaF<sub>2</sub> | 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. |
| **EC 290 ts** | For surfactant-free dip and splash cleaning; demulsifying. | Glass types and frames insensitive to alkaline media. | Residues of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust. | Solvent-based removal of protective laquer, putty, pitch and (if necessary) adhesives. |

### Framework optics / Infrared Optics - Ready-for-Assembly Cleaning

| **EC 275 dls** | For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying. | Frames and glass types insensitive to alkaline media. | Residues of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust. | Framing, pre-assembling with cleaned elements, sticking. |
| **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. | |
| **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. | |
| **EC 260 dls** | For ultrasonic, dip and splash cleaning; KDD-based, predominantly demulsifying. | Glass types and frames very sensitive to alkaline media. | Traces of adhesive (not cured), oil, grease, storage dirt, fingerprints, dust. | |
| **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. | |
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!