

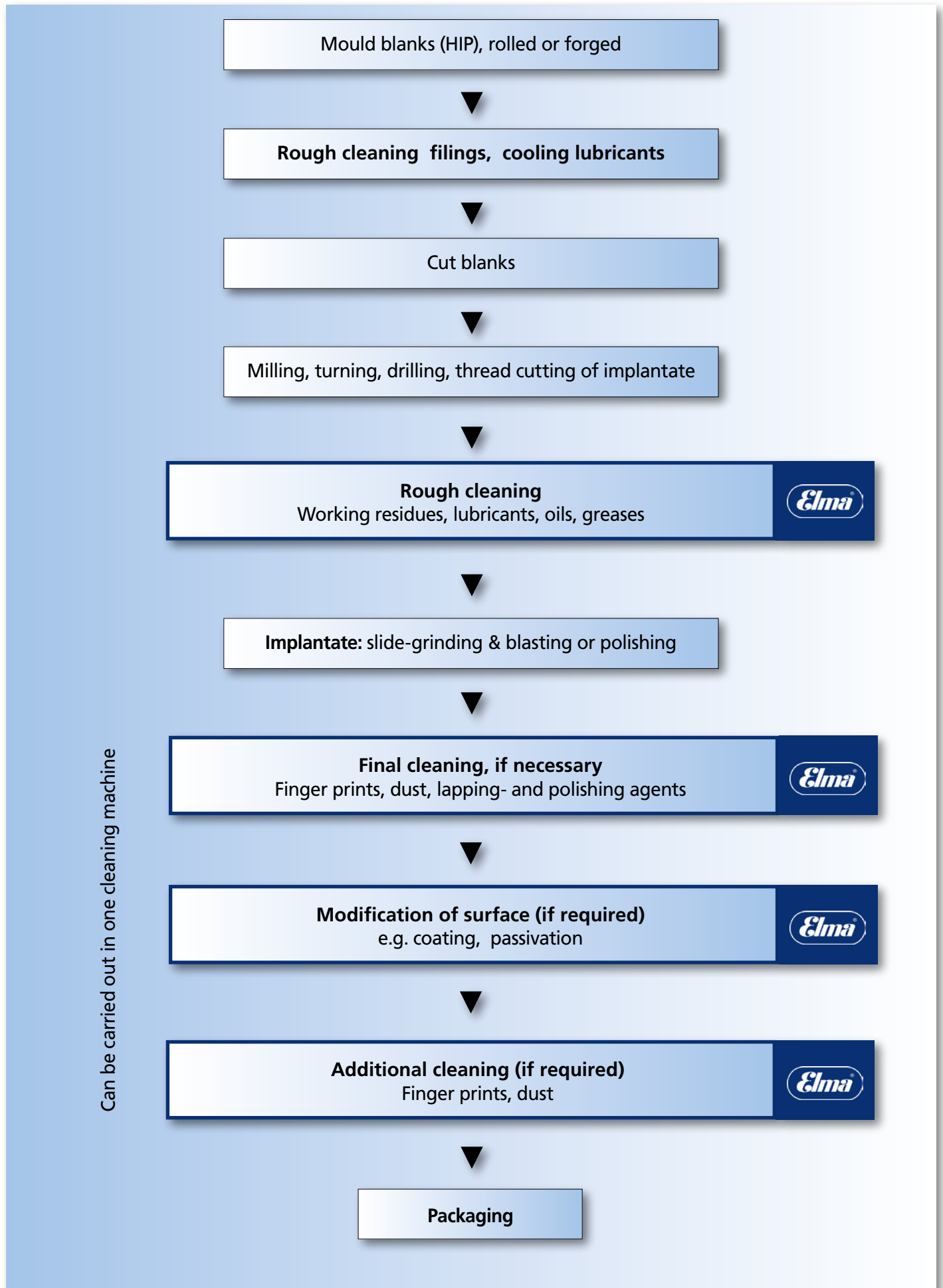
## Ultrasonic cleaning system for the medical products

- Implants of metal and ceramic
- Medical instruments, endoscopes and accessories

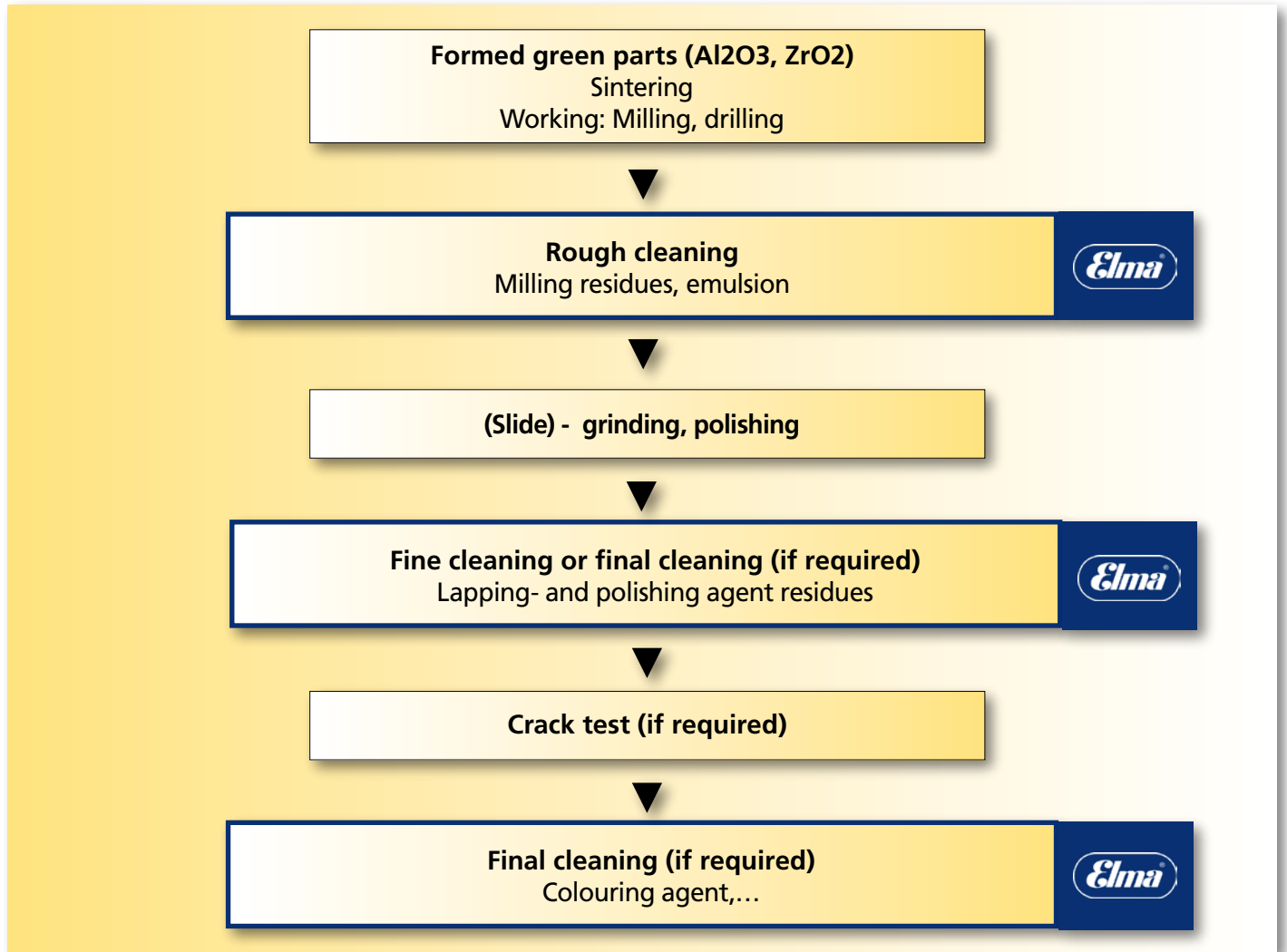


[www.elma-germany.com](http://www.elma-germany.com)

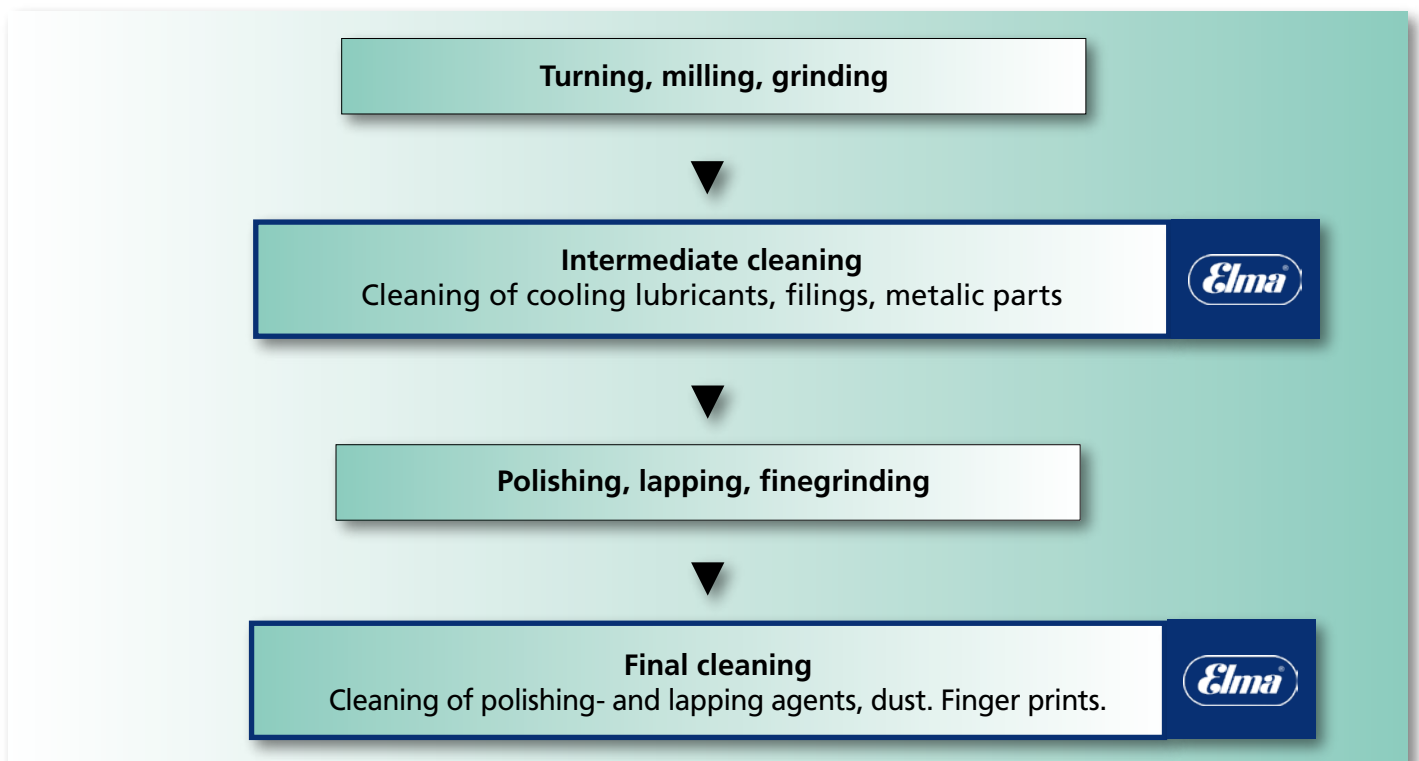
# Manufacturing process with cleaning steps for metal implants of Ti, Co/Cr/Mo, 316L, 316LN, Ta



## Manufacturing process with cleaning steps for ceramic implants



## Manufacturing process with cleaning steps for medical instruments



# Standard products for rough-, fine- and final cleaning in the manufacturing process

## Flex 1 und 2

X-tra 250 / 550 / 800 / 1200 / 1600



Ultrasonic and rinsing equipments for the cleaning of implants, medical instruments and endoscopes with water-based cleaners and following rinsing for small throughput.

Ultrasonic available in two multi frequency versions 25/45 kHz, 35/130 kHz.

Accessories: Agitation, pump filter unit for bath care.



## X-tra Line

250 / 550 / 800 / 1200 / 1600



Modular system with standard devices for the cleaning of implants, medical instruments and endoscopes for small to medium throughput. From manual devices to fully automatic versions with transport robot.

### Advantages:

- Proved industrial series devices in different sizes and versions.
- From the single device to the automated equipment.
- Elma X-tra line can be extended step by step according to your needs and available budget.
- Modular system for different cleaning requirements.
- Extensive range of options and peripheral devices.
- Short delivery time.
- Plug & Clean.
- Choice of different cleaning programs in connection with transport system.
- Interchangeable devices and options for later modification and upgrade of cleaning requirements possible.
- Upgrade of the modules and devices is possible at any time.



## STC/MTC 50-200



**Fully automatic standard equipments in different sizes and versions for the cleaning of implants, medical instruments and endoscopes for a high throughput. Process steps free selectable and with extensive options. Modular system with standard devices.**

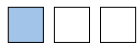
### Advantages:

- Modular system depending on the individual process requirements.
- Ultrasonic equipment with multi frequency technology for the different sensitive products.
- Flexible integration into the production process (in line solution).
- Process related flexibility of cleaning line and application.
- Well proven components.
- Graphically designed control system.
- Process control production for constant quality.
- Lower investment costs through standardization.
- Adjustment of investment costs to the shortened product lifecycles.



## Typical equipment versions for the manufacturing of metal implants

### STC100-6-WLT-F-LRS2



Cleaning product: Knee implants  
 Material: Femur, CrCoMo alloy, titanium alloy, VA, plastic material  
 Pollution: Manufacturing residues after pre-cleaning, polishing pastes  
 Cleaning result: Final cleaning before sterilisation and packaging  
 Cleaning chemistry: elma clean 112, elma clean 212  
 Process: Cleaning (Ultrasound)-Cleaning (Ultrasound) -Rinsing (Ultrasound) -Rinsing (Ultrasound)-Rinsing-Rinsing-Drying with filter  
 Size of batch: 250 x 510 x 100 mm (W x L x H)  
 Throughput: 12 batches / h  
 Periphery: Automatic loading conveyer  
 Machine speciality: Optional swivel device for assembly parts with blind holes at the robot, transport device in clean room, controlled branch before the clean room.



### X-tra-Line 550/4-WLT-R



Cleaning product: Human implants, bolts, screws and so called ADD-implants  
 Material: Titanium alloy  
 Pollution: After pre-cleaning  
 Cleaning result: Final cleaning before packaging  
 Cleaning chemistry: elma clean 112/212  
 Fixed cycle: 5 min  
 Process: Cleaning-Cleaning-Rinsing-DI-water (Ultrasound)-Drying  
 Periphery: Oil separator, filter pump, pure water circulation equipment. Loading and unloading conveyer.



## Typical equipment versions for the manufacturing of ceramic implants

### X-tra-Line 550/4-WLT-R



Cleaning product: Hip-joint implants (socket joint)  
 Material: Ceramic  
 Pollution: Working residues from polishing as dust of diamond and ceramic  
 Cleaning result: Final cleaning before inspection  
 Cleaning chemistry: elma clean 225E/I  
 Process: Cleaning (Ultrasound)-Rinsing (Ultrasound)-Rinsing-Rinsing DI (US)-Drying  
 Fixed cycle: 3 – 5 min  
 Periphery: Filter pump-aggregate for tank 1, clean water circulation equipment elmapur 100  
 Machine speciality: With validation for medical products, swinging of the parts to be cleaned.



### MTC50/7-WLT



Cleaning product: Joint implants  
 Material: Ceramic  
 Pollution: Finger prints, dust, polishing residues, residues of dye penetrant test (crack test)  
 Cleaning result: Free from residue and dry, visual control by microscope  
 Cleaning chemistry: elma clean agent 225  
 Process: Cleaning (Ultrasound)-Rinsing-Cleaning (Ultrasound)-Rinsing-Rinsing DI (US) - Rinsing DI- Drying  
 Periphery: Dosing, device, filter pump, FFU, clean water circulation equipment elmapur 600 Loading and unloading conveyer in connection with clean room lock  
 Machine speciality: Validation for medical products, swinging of the parts to be cleaned



# Typical equipment versions for the cleaning and passivation of metal implants

## X-tra 800/5-WLT-R



Type: Robot device for the cleaning and passivation  
Cleaning product: Implants  
Material: Titanium alloys, VA  
Pollution: Polishing pastes, oils, greases, Corund  
Cleaning result: Final cleaning/passivation  
Cleaning chemistry: elma clean 112, elma clean 212  
For passivation: elma clean 115C  
Process: Cleaning (Ultrasound)-passivation (Ultrasound)-Rinsing-  
Rinsing (DI)-Rinsing (DI/Ultrasound)-Drying  
Periphery: Oil separator, pump filter, clean water circulation  
equipment  
Machine speciality: Device can be used for cleaning (fixed  
cycle: 5 min) or for cleaning and passivating (Fixed cycle: 10 min)



## STC50-7-WLT-LRS1



Type: Robot device for cleaning and passivation  
Cleaning product: Medical implants  
Material: Titanium or stainless steel  
Pollution: Polishing pastes, finger prints, working residues  
Cleaning result: Final cleaning before assembly and packaging  
Process: Cleaning (Ultrasound)-rinsing-passivation (Ultrasound)-  
Rinsing (DI)-Drying  
Cleaning chemistry: elma clean 112, elma clean 212  
For passivation: elma clean 115C  
Periphery: Tunnel dryer, automatic dosing, pump filter



## x-tra 550/8-WLTZ-M



Type: Fully automatic robot device for the final cleaning  
Cleaning product: Implants and instruments  
Material: Stainless steel, titanium  
Pollution: After the mechanic test, finger prints, particles  
Process: Cleanig (US), Rinsing, Passivation (US), Rinsing,  
Rinsing DI (US), Rinsing DI, Drying  
Cleaning chemistry: elma clean 112, elma clean 212  
Passivation: elma clean 115C  
Periphery: Automatic dosing, PF  
Machine speciality: Device can only be used for cleaning (fixed  
cycle: 5 min) or for cleaning and passivating (fixed cycle: 10 min)



# Typical equipment versions for rough and fine cleaning for the manufacturing of medical instruments, endoscopes and accessories

## x-tra-550/4-WLT-M



Cleaning product: Medical instruments  
Material: Titanium, stainless steel, aluminium  
Pollution: Working emulsion  
Cleaning result: Final cleaning before sterilisation and packaging  
Cleaning chemistry: elma clean 225E/I  
Process: Cleaning -rinsing - passivation - DI - Drying  
Periphery: Oil separator, filter pump, clean water circulation equipment  
Machine speciality: Manual device with control, also available as fully automatised robot device



## Accessories

Besides the cleaning devices and equipments Elma offers a wide range of accessories.

Water treatment plant for the generation of softened city water, reosmosis water resp. pure water for the circulation in different classes of performances of 100 - 2400 l/h.



Pump filter units for the continuous bath care of cleaning and rinsing tanks.



Laminar flow modules for the generation of clean room conditions within closed cleaning equipments.



## Reference list

Aesculap-Werke  
Bayer AG  
Ciba-Geigy  
Fehling  
Henke-Saas-Wolf  
Hoffmann La Roche  
Keramed  
Kreidler  
Link  
O. Leibinger  
R. Martin

Tuttlingen, Germany  
Leverkusen, Germany  
Basel, Switzerland  
Karlsstein, Germany  
Tuttlingen, Germany  
Grenzach-Wyhlen, Germany  
Moersdorf, Germany  
Tuttlingen, Germany  
Norderstedt, Germany  
Mühlheim-Stetten, Germany  
Tuttlingen, Germany

Rudischhauser  
S + N Richards  
Siemens UB med  
Steiner  
Storz  
Wenzler  
Ceramtec  
Digitana  
Prototyp  
JRI Limited

Tuttlingen, Germany  
Tuttlingen, Germany  
Erlangen, Germany  
Engen, Germany  
Tuttlingen, Germany  
Tuttlingen, Germany  
Markdrewitz, Germany  
Horgen, Switzerland  
Freiburg, Germany  
Sheffield, UK

Contamination	Processing steps before and after cleaning	Stainless steel, Titanium	Aluminium alloys	Ceramics	Plastic materials	Product (short name)	Properties	Recommended application concentration, character; pH-value
<b>Precleaning and intermediate cleaning</b>								
Residues of mechanical treatments: emulsions, oils, greases; abrasives, mass finishing & polishing agents.	After or between steps of mechanical treatments like turning, milling, drilling, grinding or polishing.	+		+	+	elma clean 110 (EC 110)	Concentrate for the ultrasonic cleaning, NaOH-based, emulsifying.	3-5 vol%, strongly alkaline; pH: 12-13
Residues of mechanical treatments: emulsions, oils, greases; abrasives, mass finishing & polishing agents.	After or between steps of mechanical treatments like turning, milling, drilling, grinding or polishing.	+		+	+	elma clean 112 (EC 112) + elma clean 212 (EC 212)	Alkaline builder- and surfactant-concentrate for the ultrasonic cleaning, KOH-based, demulsifying.	4 vol% EC 112 + 0.4 vol% EC 212, strongly alkaline; pH: 13-14
<b>Final or finest cleaning, respectively</b>								
Polishing abrasives and mass finishing agents, fingerprints, dust and particles.	After polishing, mass finishing, blasting and before packing up.	+		+	+	elma clean 110 (EC 110)	Concentrate for the ultrasonic cleaning, NaOH-based, emulsifying.	3-5 vol%, strongly alkaline; pH: 12-13
Mass finishing agents, fingerprints, dust and particles.	After mass finishing, blasting and before packing up.	+	+	+	+	elma clean 260 dip& splash (EC 260d&s)	Concentrate for the ultrasonic immersion cleaning and for cleaning by splashing, removes lime soaps, demulsifying.	immersion cleaning: 1 - 2 vol%, splashing: 0.5 - 1 vol%, neutral; pH: 7.5 - 8.5
Mass finishing agents, fingerprints, dust and particles.	After mass finishing, blasting and before packing up.	+		+	+	elma clean 300 (EC 300)	concentrate for the ultrasonic cleaning, KOH-based, emulsifying.	1 - 5 vol% alkaline; pH: 11.5-12.5
Polishing abrasives and mass finishing agents, fingerprints, dust and particles.	2nd cleaning step after alkaline cleaning (after polishing, mass finishing, blasting), before packing up.	+	+	+	+	elma clean 115C (EC 115C)	Concentrate for the ultrasonic cleaning, based on citric acid, emulsifying.	1-3 vol%, weakly acidic; pH: 2.5 - 4
<b>Passivation of stainless steel surfaces</b>								
Iron ions in the surface of stainless steel parts (passivating layer) - they are a risk of corrosion.	After cleaning and before packing up.	+				elma clean 115C (EC 115C)	Dissolves iron ions out of the oxidic surface layer by forming soluble iron compounds.	10-20 vol%, acidic; pH: ~2

## We about us

Highly specialized, and yet innovative in multiple ways – this is ELMA, a company which has successfully been on the market with their ultrasonic technology for more than 50 years now. ELMA started in 1948 with only 2 people who had an idea for a totally new watch cleaning machine. They kept looking for the perfect cleaning technology which eventually led them to try ultrasound.

Constant research and permanent technical improvement of the products in the ultrasonic and process technology department have always been the core competence of the company. The product range contains a large number of serial units, modular cleaning lines and special customer-made cleaning installations. Cleaning chemicals, developed, tested and produced in our own chemical laboratory round off the ELMA product range and help to solve even the most difficult cleaning jobs in various business sectors.

ELMA are exporters of customized state-of-the-art technology into more than 70 countries all over the world, distributing their products to watchmakers and jewellers, to dental and research laboratories, to companies in the medical and optics sector and to industrial businesses. You can find ELMA products on more than 100 international trade

shows. Numerous distributors around the world recommend the ELMA technology to their customers and rely on the ELMA quality standard „Made in Germany“.

There is a staff of more than 200 people working in the research and production departments at three company sites in Singen in the South of Germany.

With ELMA, quality and service enjoy top priority! In addition to the main business with ultrasonic technology, we have been highly competent as a partner for watchmakers and jewellers, looking back on a long tradition in this sector. There are special machines for all purposes around the valuable watches and jewellery: for manufacturing, for testing, for servicing and for cleaning and the ELMA engineers are constantly working on the development and design of new machines.

