

Precision in detail

System technology for perfect surfaces

Walter Lemmen GmbH



Surface technology
Medical technology
PCB technology
Automatisation
Filter technology

www.walterlemmen.de



● Walter & Dieter Lemmen | CEO's

Over 40 years of experience and passion

PLANT CONSTRUCTION | ENGINEERING |
SURFACE TECHNOLOGY

For over 40 years the Walter Lemmen Ltd. has been producing an extensive selection of products, for the surface and printed circuit board technology for industry, research and teaching. The different facilities are constructed and manufactured in our factory in Kreuzwertheim and distributed worldwide. The product range includes machines and equipment for the production of single or double-sided PCBs, through hole plated PCBs and multilayers for prototypes and small serial production. Barrel and rack treatments are individually adapted to customer requirements for electroplating and finishing of different materials. These applications are used for decorative and functional surfaces to complement the portfolio. The outstanding results can be seen in exceptional quality materials and components thereby guaranteeing a low maintenance operation.

01 Surface technology



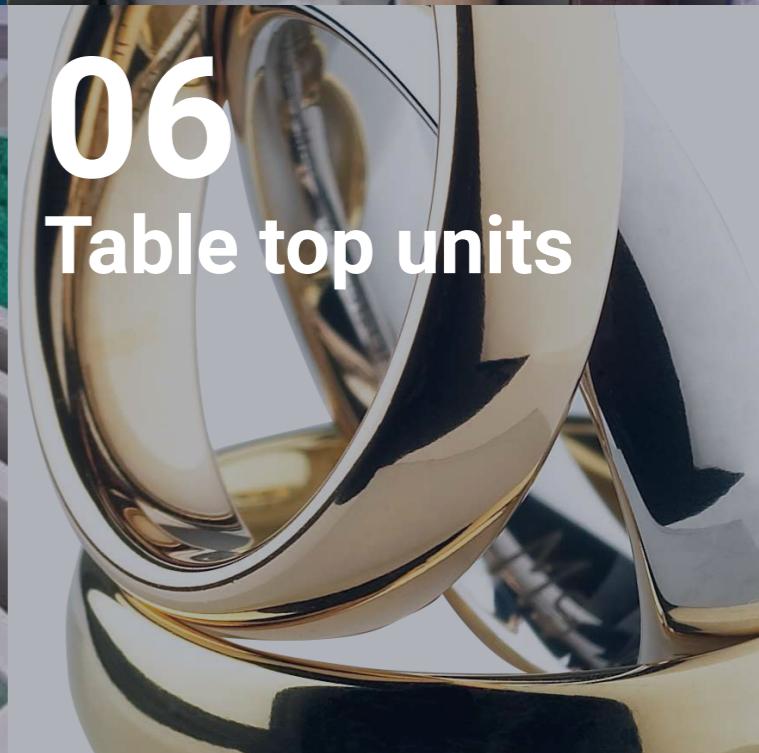
05 Automation



02 Medical technology



06 Table top units



Precision in Detail

The complete program for PCB & surface technology

DEVELOPMENT | CONSTRUCTION | PRODUCTION

Walter Lemmen Ltd. offers as a system supplier, the development, design and construction of equipment and systems for printed circuit boards and electroplating. Additionally, the company offers a complete product and service program, consisting of the delivery of customer-specific systems, components and chemistry, service and environmental concepts for various industrial branches. Our main customers include the PCB industry, the automotive industry, the electronics industries, the aerospace, the telecommunications and management industry, the control systems, the medical technology and the photovoltaics industry. The company has a close cooperation with different institutions in research and development. The basis for innovative implementations and enhancements of our plant diversity, is found in colleges, universities and in several industries and used to support new technologies in the printed circuit board technology and electroplating.

Surface technology

01

WALTER LEMMEN GMBH
SURFACE TECHNOLOGY

Product rage:**Tank volume:**

5 liters - 100 liters

(other volumes on request)

Design:

Manual rack and barrel treatments

Automatic handling systems on request

Units for pre-treatment:

Pre-cleaning

Degreasing

Ultrasonic

Systems for decorative surface treatment:

Gold

Silver

Rhodium

Chrome

Systems for functional surface treatment:

Copper

Tin

Zinc

Electropolishing

Systems for anodization and coloring treatments

Anodization

Titanium coloring

**Decorative and functional surface treatment for rack and barrel treatment**

With our extensive knowledge and wide product range, we offer high productive systems in the field of surface technology and finishing. Our system covers an entire range for processing of the most diverse materials for decorative and functional

surface coating. This includes cleaning, coating and finishing of barrel and rack treatment of plastics, steel, aluminum and titanium or other metals. Customer-oriented concepts matched with the respective chemical processes and reliable services comple-

ment the portfolio. As a competent partner for the PCB and electronics industry as well as the automotive, sanitary, jewelry and consumer goods industry, we pursue a high quality standard and reliability in corrosive resistant surface.



● COMPACTA | Decorative



Life-saving in detail

Medical technology

02

MEDICAL
TECHNOLOGY

Product range

Equipment for surface treatment of titanium and titanium alloys:

Pretreatment: degreasing / ultrasonic

Pickling

Color anodizing

Gray anodizing

Etching

Electropolishing

Rinsing

Drying

Equipment for surface treatment of stainless steel:

Pretreatment: degreasing / ultrasonic

Pickling

Electropolishing

Passivation

Rinsing

Drying

Units for manual and semi-automatic applications:

Manual rack, basket or drum systems

Semi-automatic with handling system and SPS control system

Tank volume:

Manual units:

5 liters - 250 liters volume

(Larger tank volumes on request)

Semi-automatic units:

5 liters - 100 liters volume

Load weight Handling system: max. 10 kg

(Larger tank volumes on request)



Surface treatment of materials of medical technology

Titanium and Titanium Alloys

Niobium, Nitinol, Tantalum

Chromium-Cobalt Alloys

Stainless-steel

The requirements for medical instruments, components and materials are varied and complex. Safety and reliability materials, manufacturing processes and machine technologies are used in medical technology have high priority.

In addition, the validity of the complete process and sequences are increasingly important. Especially metallic heart or dental implants are subject to strict material properties:

High mechanical strength, highest biocompatibility and corrosion resistance. Raw-Materials such as titanium, niobium or stainless steel provide these material properties for highly stressed medical instruments and components.

For the surface treatment of medical instruments and components we offer special designed tank systems and compact electroplating units, manually operated or semi-automatic with handling system and PLC control.

The modular design of the electroplating units includes all the necessary process steps and tank applications for a high-quality surface. We offer as a system supplier, the development, design and construction of equipment and systems for the treatment of medical components. Additionally the complete product and service program, consisting of the delivery of customer-specific systems, components and chemistry, service and environmental concepts for the medical industry.



● Titanium coloring device | Implants

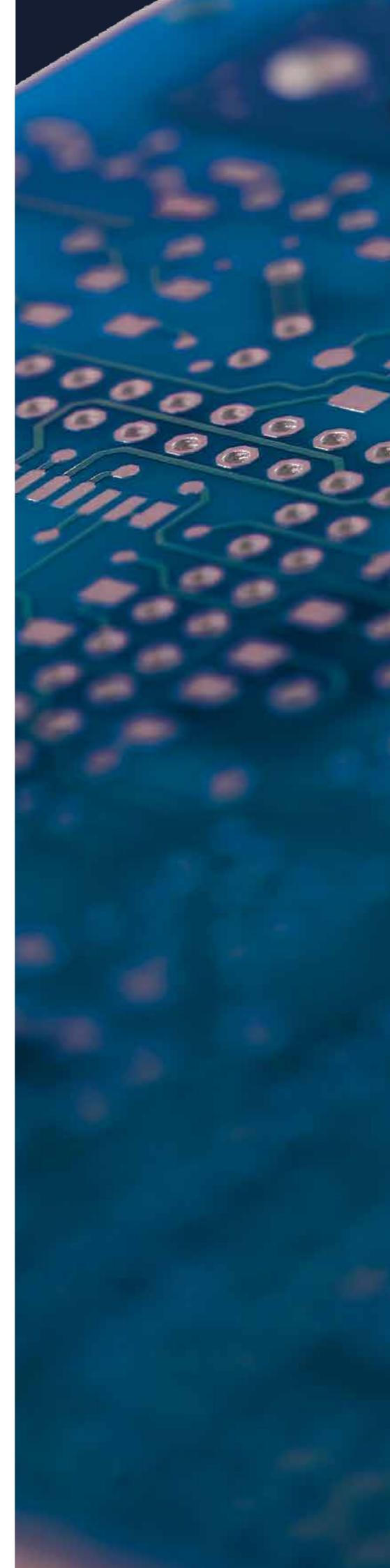
PCB technology

03

PCB
TECHNOLOGY

PCB technologies

- One and double sided PCBs
- Through hole plated PCBs
- Multilayer up to max. 6 layers
- RF circuit boards
- LTCC - Ceramic
- MID-Wafer Technology
- HDI Micro via Technology
- Flex and Flex-rigid Board Technology
- Thick Copper Board Technology
- Insulated Metal Substrate (IMS-Board Technology)
- Structuring of non-ferrous metals, stainless steel and aluminum front panels and labels



“

The demand for finer and more complex structures, small components and flexible materials is growing rapidly. As a result, the company is expected to be fast and flexible in implementing the new technologies with available highquality equipment.“

● **Walter Lemmen** | CEO

Equipment for the manufacture of printed circuit boards

The Walter Lemmen Ltd. has a perfectly matched equipment program. It covers the entire manufacturing process to produce high quality printed circuit boards with complex structures. Additionally it covers fine conductor plates, widths and distances on different base materials. The product lines from the Walter Lemmen Ltd. ranges from systems for structuring, surface treatment and through hole plated systems. Surface facilities for the protection of one and double sided printed circuit boards, chemical milled parts and multilayer are also included. Our product range is complemented by environmentally friendly production technologies. This includes a high level of safety standards, reduction of environmental pollution, lower consumption of raw materials, chemicals, energy and water. Integrated rinsing and filtration technology, regeneration equipment, wastewater treatment plants and electrolytic cells used for the complete recovery of precious metals from the rinse water process are reflected in our products.



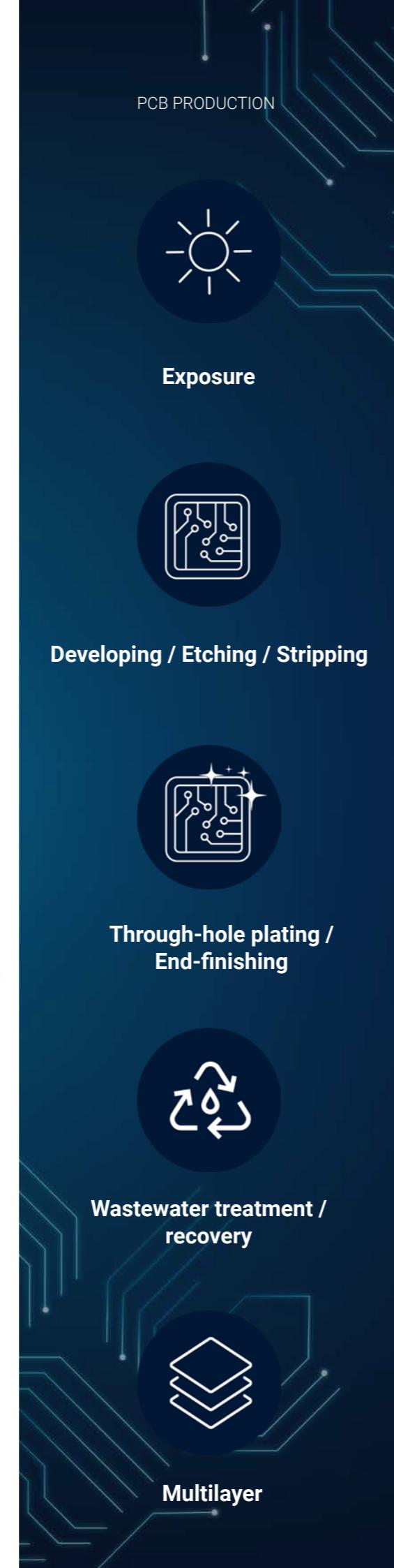
● **Etching Center S** | Developing & Etching



Developing - Etching - Stripping

The spray development and spray etching units, ETCHING CENTER S and CONVERT from Lemmen Ltd., are suitable for the production of fineline single or double-sided printed circuit boards or chemical milled parts. The systems are available either manually or vertically, which are operating systems with integrated rinsing modules.

Our new rotation spray systems give uniformity and intensive treatment to the entire surface. The units are equipped with multiple rinses which is characterized by their clean and compact way of working. The modular design allows expansion of the units by a stripper and dryer module.



Through hole plated technology

The creation of high-quality printed circuit boards and multilayers require high precision and systems engineering for the metallization of the holes, soldering of the contacts and finishing, which protects against oxidation and corrosion. To create the through-hole plated printed circuit boards, the PCBs must be pretreated

by a wet chemical process, by metallizing the substrate inside the hole and thereby establishing connection between the individual layers. For the through-hole plating galvanic process we offer our range COMPACTA, as a general-purpose electroplating plant, for the chemical or electrochemical treatment of metals in vertical

technology. In consultation with the customers requirements the desired through-hole plating system is constructed. The general production of high quality through-hole printed circuit boards, is based on an environmentally friendly direct metallizing with graphit as catalyzer, in tenting or subtractive process.



● COMPACTA | Troug-hole plating

04

Filter technology

Environmental protection

Walter Lemmen GmbH

21

FILTER
TECHNOLOGY

Product range

Waste-water-treatment

Circulation ion exchange units with resin volume 1.5 - 30 liters
 Ion exchange cartridges (cation, anion, mixed bed)
 Ion exchange resins (cation, anion, mixed bed)
 Active carbon filters
 Regeneration service
 Change of resin mixed bed
 Fully de-sterilized / mixed bed cartridges
 Reverse osmosis systems

Metal recovery (closed and open systems)

Metal-Recovery Systems for the recovery of precious metals
 Metal-Recovery Systems for the recovery of non-precious metals
 Stripping equipment in combination with recovery cells

Filter technology

Solid filter with filter cartridges activated carbon
 Solid filter with filter cartridges PP
 Complete filter units with pump in different versions
 Bag filters
 Filter housing

Exhaust air technology

Exhaust Air washer
 Demister Laboratory ventilators



Waste-water-treatment | Metal recovery | Filter technology

ENVIRONMENTAL TECHNOLOGY SYSTEMS

In addition to the development, design and construction of equipment and systems for surface technology, we offer a complete product and service program and environmental concepts for various branches of industry: Exhaust air technology, filtration, treatment and recovery. We are supported

by qualified specialist companies who work with us to guarantee the optimum design and implementation of customer requirements. Through environmentally friendly production methods and the use of high-quality components, we ensure process reliability, reduced environmental pollution and

lower consumption of raw materials, chemicals, energy and water. This includes integrated rinsing technology, water treatment systems as circulation systems and electrolysis cells for the complete recovery of precious metals from rinsing water.



● **Environmental technology** | Exhaust air technology, filtration, recovery and recycling

Waste-water-treatment

Special filters and water treatment technology ensure a clean water process. Besides a large selection of filters, we offer solid ion-exchange systems in the series IONEX that allows for continuous cleaning and reuse of rinse water from rinsing baths and sinks savings. This contributes to an increase in the circulation of water quality and substantial water savings.

The waste water treatment is designed as a circulation or flow-through system. The circulation system cleaned and filtered the waste-water and return it to the electroplating units for reuse. Through the use of special ion-exchange resins precious metals (gold, silver, rhodium, palladium) can be recovered from the rinse water. The recovery of ion exchange resins is offered as a service and is therefore an economic solution in the waste water treatment process.

IONEX

Waste-water treatment units



Metal recovery

The TG-Electroplating systems have a standard tank volume of 5 l / 10 l / 20 l and 50 l, allows the individual assembly of treatment tanks. The TG-Electroplating system can be converted into an electroplating tank, by using conversion kit E or in a cleaning tank with air agitation by using conversion kit S. Additional options, such as agitation for movement, rectifiers, floor heaters with temperature controllers and barrels equipment allows reliable surface treatment for various applications.

METAL RECOVERY

Recovery units for precious metals



Filter technology

Complete solid filter units for particles and fine filtration of electroplating and chemical production processes. Different applications in combination with sealless magnet coupled centrifugal pumps in PP / PVDF / ECTFE suitable for fine filtration of organic and inorganic pollutions of aggressive and neutral liquids.



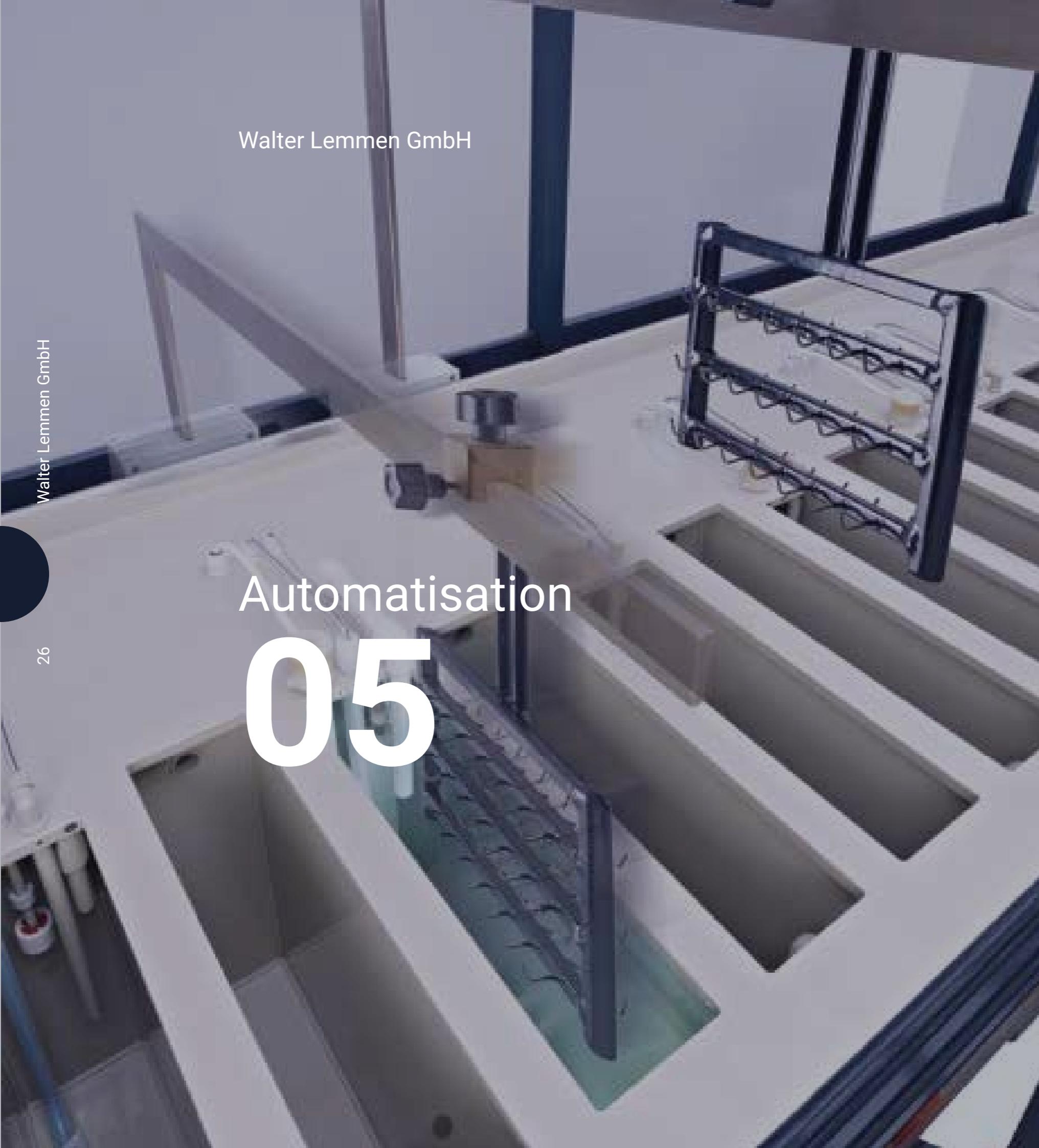
Exhaust air technology

FANS | DROPLET SEPARATORS | EXHAUST AIR SCRUBBERS

Custom-designed and converted laboratory air absorption systems, as additional application next to the exhaust ventilators for a clean laboratory environment. The system is controlled fully automatic and equipped with a level control system for filling and refilling the wash water, conductivity and pH control and monitoring system.



● Environmental technology | Exhaust air technology



Automatisation

05

Walter Lemmen GmbH

AUTOMATION

Electroplating systems with robotics

The new COMPACTA ROBOT electroplating line, in combination with advanced industrial robot technology, offers an optimal automation solution for electroplating processes. The control unit with operator panel offers numerous setting options, parameter management and product management. The automated processes achieve high savings potential and perfect surface results.



PLC-controlled electroplating systems

The COMPACTA PLC optimizes and automates chemical and electrochemical processes in electroplating. It offers numerous control options & setting parameters for a customer-specific process sequence. Through automation, consistent surface results can be achieved repeatedly.



Features



Robot

With the robot arm, up and down movements as well as rotating and swiveling movements can be individually customized and carried out. The uniform movements enable a consistent surface result across all batches.



Linear axis

The optionally available linear axis increases the horizontal working range of the robot arm up to 5 meters. This allows complete electroplating processes to be mapped.



Barrel-, basket- & rack treatment

The COMPACTA ROBOT is multifunctional and can be used for barrel, basket and rack treatment.



PLC

In conjunction with a PLC, additional unit interfaces can be programmed and automated.



Linear axis

With the COMPACTA PLC electroplating line, upward and downward movements on the linear traverse system can be individually programmed and executed. The process sequences take place sequentially or optionally in parallel operation.



Rope system

The rope system developed in-house for transporting the product carriers is made of chemical-resistant polypropylene and is therefore suitable for all chemical and electrochemical electrolyte applications.



System variants

The COMPACTA SPS is multifunctional and can be used for drums, baskets and racks.



Table top units for
surface treatment

06



TABLETOP
UNITS

Product range

- Electroplating systems for the standard sizes of 1,5 – 3,0 liter tank volume
- Electroplating single tanks for the standard sizes from 5 - 50 liter tank volume
- Small electroplating plants as barrel or rack systems for the standard sizes from 5 - 100 liters of tank volume
- Pickling
- Stripper systems for precious metals
- Developing and etching equipment for structuring stainless steel and non-ferrous metals
- Accessories for electroplating

TG Program TABLE TOP UNIT

Table top unit | 5 / 10 / 20 / 50 Liter



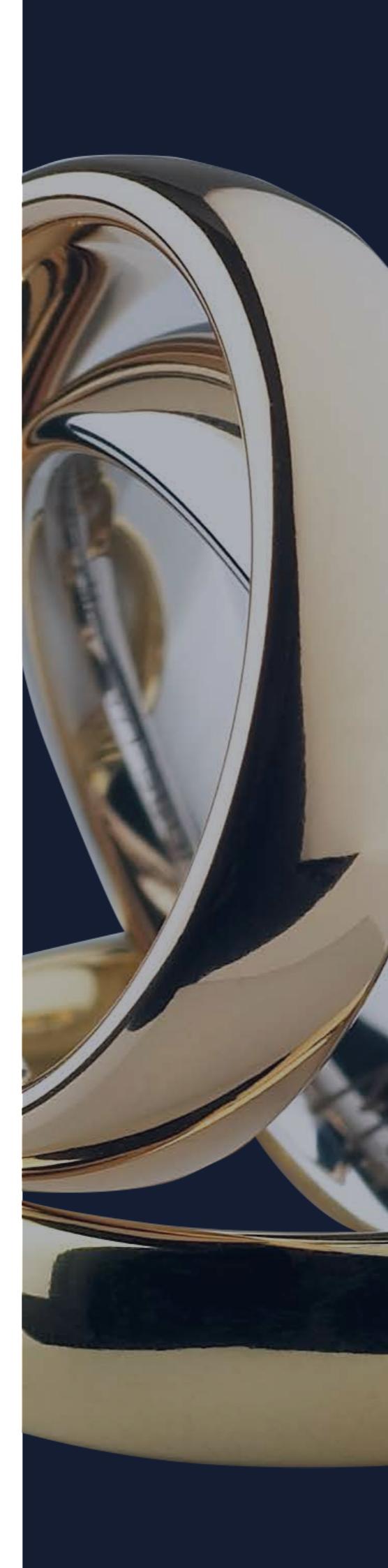
WILAPLAT TABLE TOP UNIT

Electroplating Unit for functional & decorative surfaces



COMPACTA TABLE TOP UNIT

Tank sizes 5 / 10 / 20 Liter



Small electroplating systems for decorative and functional surfaces

In addition to our small electroplating plants, we offer a universal program for smallappliances for functional and decorative surfaces with small bath volumes. These multi-functional devices and systems from 1,5 liter tank volume are suitable for the jewelry-industry, medical and industrial manufacturing of small parts. Through a variety of different bath components, such as heaters, rectifiers, barrels, racks, filters and ion exchange equipments, the units offer the optimum surface condition for a professional result.



● TG-Program | Table top unit

Walter Lemmen GmbH

Birkentraße 13
97892 Kreuzwertheim
info@walterlemmen.de
+49 (0) 9342 240 977 - 0
+49 (0) 9342 240 977 - 29
www.walterlemmen.de

