

THERMAL SYSTEMS

Protective coating for electronic assemblies

Highly selective conformal coating



PROTECTO
Coating

Coating

Reliable protective lacquer coating
for high grade electronics



Highly selective conformal coating as a key to a wide range of applications

Conformal coating offers many possibilities in electronic manufacturing. Protective lacquer coatings are used particularly in the manufacture of products where error-free functioning needs to be ensured in spite of strenuous environmental influences, and ensure reliable control of complex electronics. Extreme variations in temperature or humidity should be irrelevant – the electronics have to function just as well on the North Cape as in a desert country or a rainforest.

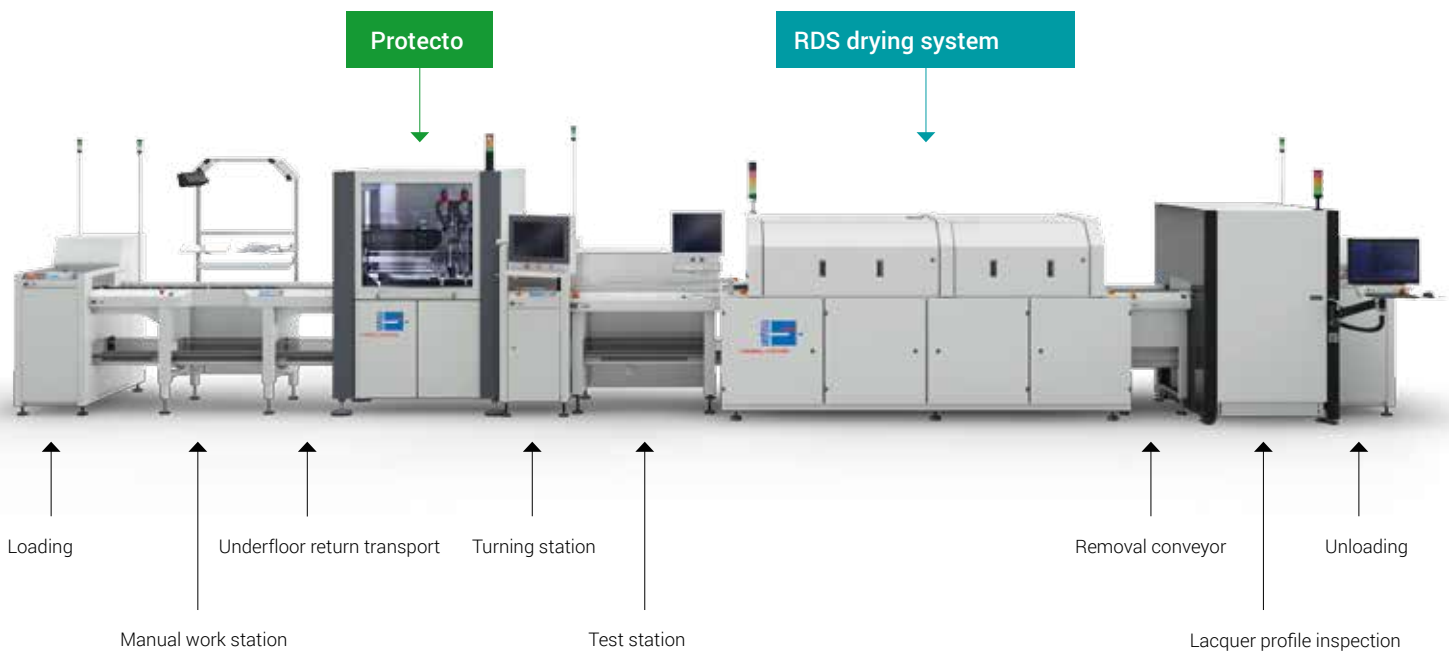
The use of protective coatings improves the quality and durability of your products. Our Protecto selective conformal coating system protects sensitive electronic assemblies from damage by corrosion or other environmental influences, such as humidity, chemicals or dust. There are numerous areas where circuit boards are constantly exposed to dirt or demanding environmental conditions. Many of these products are closer to us than we think, and some of them even protect our lives. In these cases the use of protective lacquer coatings makes perfect sense for conserving the functionality of circuit boards over a long period. Fields of application range from offshore wind farms through shipbuilding, military hardware, telecommunications, medical technology, industrial control and automotive systems to electronics in private households.

Full power for your turnkey solution

Flexibility from start to finish

Would you like to combine optimal coating solutions and reliable drying methods in your manufacturing process? Our conformal coating concept, which consists of the Protecto coating unit and an RDS coating dryer, including handling based on customer specification, is a turnkey solution for the selective conformal coating process. Thanks to highly efficient and accurate coating technologies, the Rehm Thermal Systems line can be used for all selective coating applications

and is available with a range of handling variations. This allows you to produce in a flexible and reliable way and makes you ideally equipped for the demands of complex processes. The RDS drying system is suitable for hardening all conventional coatings immediately after the coating process. An optional integrated underfloor return transport system ensures an even faster and more effective production flow.

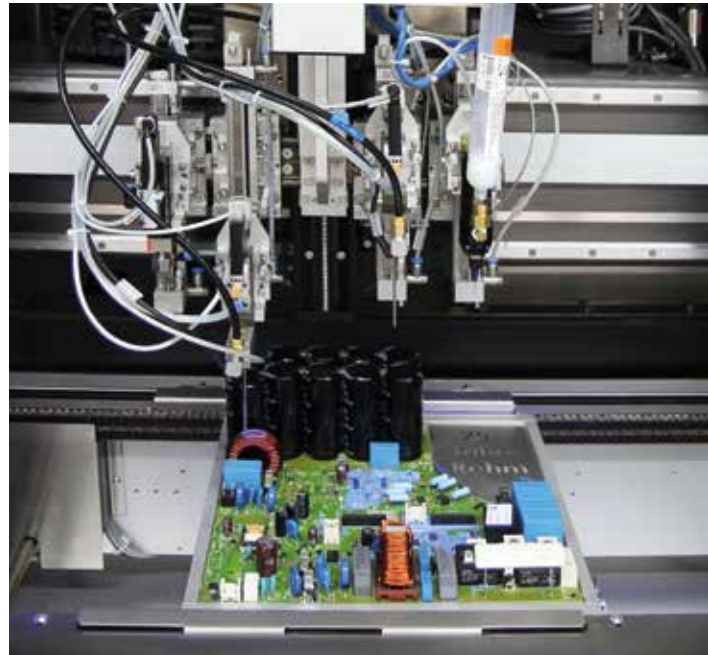


- › Greatest possible process reliability
- › All-in-One lacquering
- › Flexible lacquering options thanks to multifunctional lacquer applicator
- › Highly selective coating
- › Minimal maintenance
- › Effective lacquering and drying in a line concept
- › Quick, intuitive programming with dependable software tools

Flexible lacquering procedures for optimum coating

Protecto will satisfy your need for the highest quality, stability and productivity for automatic inline coating jobs. Your product requirements determine how the plant is equipped.

Circuit boards are usually not coated completely, since parts such as switches or electrical plug connections need to remain uncoated to retain their functions. There are various application procedures for these sometimes highly selective coating jobs. With up to 4 lacquer applicators, you can simultaneously coat 4 assemblies synchronously in a master-slave operation or apply up to 4 different materials directly without a set-up time.



All-in-One lacquering

The patented Stream-Coat® nozzles are compatible with all conventional coatings, from low-viscosity to high-viscosity. An external diameter of just 2.4 mm with a length of up to 100 mm allows optimum coating even between tightly packed, tall components or even under the components themselves. With Protecto you can carry out the various selective application procedures of dispensing, spraying,

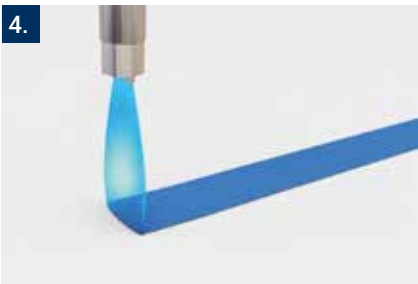
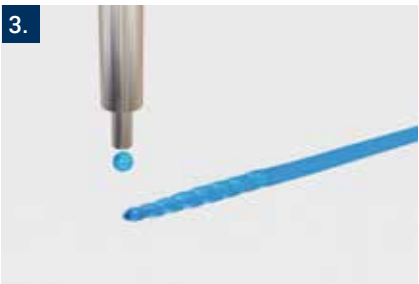
jetting and curtain coating “on the fly”. An implicit air nozzle precisely dispenses the coating and distributes it with little splatter or mist. The homogeneous film of coating can, with the aid of the adjustable airstream, even be applied under or behind adjacent component pins and in shadow zones without the need to tilt the applicator.



Precise coating of electronic connections between tightly packed, tall components

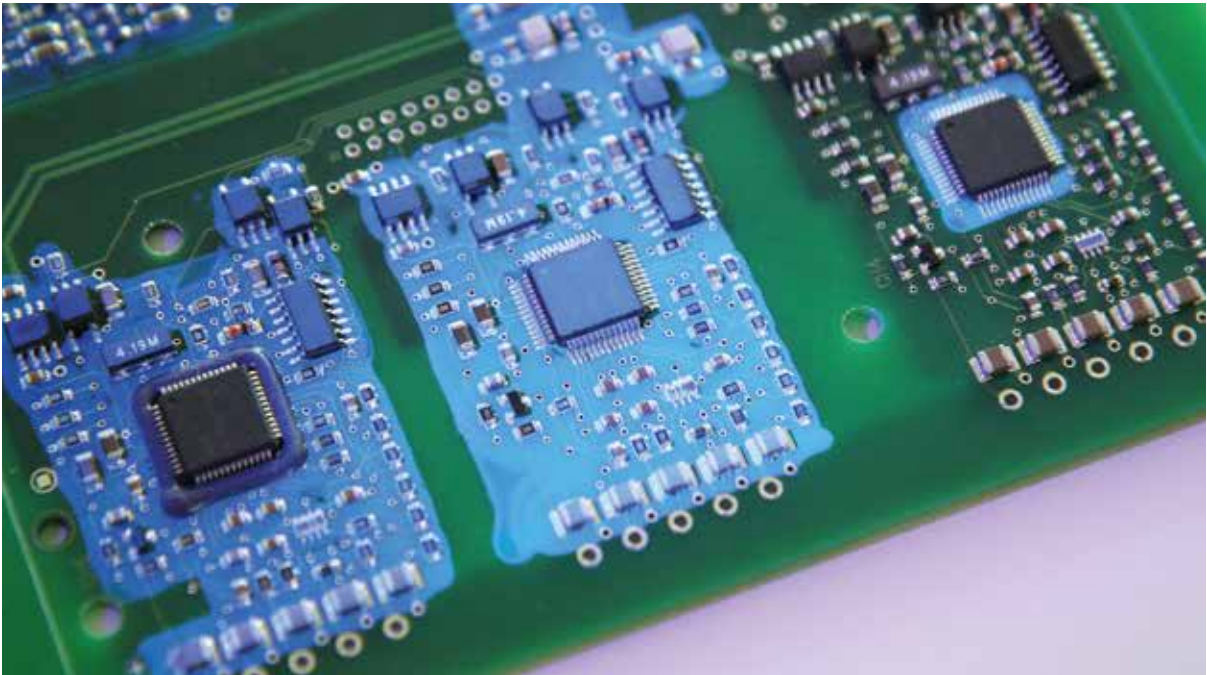


Multifunctional lacquer applicator for perfect application



- 1. Dispensing**
Homogeneous and precise application of a thixotropic material
- 2. Spraying**
Coating of large areas with a low splatter and mist spraying procedure
- 3. Jetting**
Pinpoint lacquer application of up to 120 miniature dots per second through rapid opening and closing of the valve
- 4. Curtain Coating**
Coating of large areas with little splatter and mist at considerably higher process speed

Optimum coating profile



Protecto makes precise and homogeneous coating achievable. The picture shows the following application procedures under UV light: laying a barrier by dispensing and then jetting with multi-line (left), jetting of large areas without distributor air (middle) and jetting without distributor air with frame tool for high edge accuracy (right).

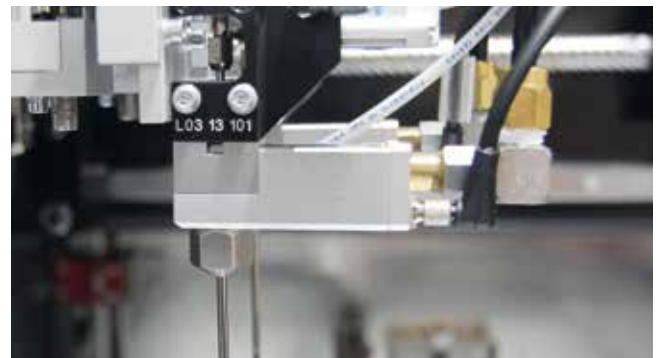
Greatest possible process reliability with innovative options

When it comes to coating, one thing is essential: precision. Protecto is designed to ensure that the required volume of coating is always evenly applied, whether through a pressure valve, a cartridge or a pump from the original container. Automatic needle measurement checks the target position of the applicators in freely definable cycles and if necessary corrects the coating program automatically. The dispensing of the

lacquer is controlled by the software, which loads the appropriate coating program with the suitable lacquer and nozzle type. An optional heated nozzle keeps the protective coating always at a constant temperature and thus a consistent viscosity regardless of environmental conditions. A specially developed lacquer lance with a level indicator prevents bubble formation when changing the lacquer.



Needle measuring cross with auto-correction



Jetting heating

A camera system for a wide range of applications

For absolute process reliability Protecto is optionally equipped with a fiducial camera. This means the coating program can be corrected and aligned by registering the marks even if a board is laid into the flight bar inaccurately. A barcode checks whether the set coating program is right for the assembly in place. If there is a deviation the process is automatically blocked.



Fiducial camera



Reliable process with low maintenance costs

Rehm has developed a ground-breaking cleaning system for Protecto which is particularly maintenance-friendly. A brush station with a solvent bath allows optimum cleaning of the lacquer nozzles. Even if the system has been off for up to ten days, it is operational at the touch of a button without additional cleaning work. An innovative blowout station allows automatic cleaning in just a few minutes when materials are changed. All technical control elements, including cleaning equipment, are compactly integrated in the plant and easily accessible for maintenance work.



Brush and blowout station

Optimum assembly protection without contamination of the work environment



Easily accessible lacquer supply in the plant

To prevent contamination from vaporised solvents of lacquers and compounds in the immediate vicinity of the Protecto, the lacquer supply is integrated in the system at the back of the plant. This means there is no odour pollution from random releases of solvent vapours into the environment. The plant also has an extractor system which conducts and removes solvent-containing evaporations to the in-house exhaust system during the coating process.

For a clean process and comfortable working atmosphere in your production line!



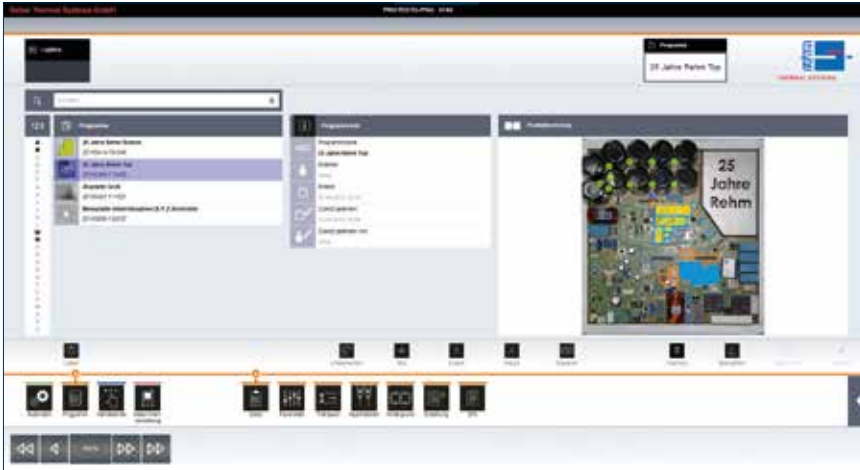
Innovative software tools for easy programming

The Protecto is operated via intuitively controlled software and made particularly user-friendly by a newly developed touchscreen interface. It has numerous software features including online and offline programming, language selection, rights management, MES connection and uncomplicated operator guidance. This means you can not only adapt all your work steps flexibly to your product requirements and process flow, but you can at any time track and document all procedures transparently as well.

For optimum and reproducible coating results!



Programming, process locking, traceability for reliable process documentation



Simple program selection through product management with preview

The Protecto software makes programming the coating procedure simple and fast. The assembly is shown as a background image. The areas to be coated can then be defined via various line and surface elements. Touchscreen operation makes this a trouble-free procedure. Further process parameters such as lacquer, supply container, and valve settings are stored in the product

management system. The fiducial camera can scan DMC codes for the assembly currently in the plant and thus guarantee traceability. This is particularly important with regard to traceability and MES connections. As soon as a discrepancy occurs, insertion of the assembly into the plant is automatically blocked to prevent serial errors. The highest process reliability for your manufacturing!

Operating system

The new Protecto software is installed on a powerful industrial computer and uses the reliable Windows 7® operating system.



Offline programming

The Protecto software can be installed on an external device at any time. This permits offline programming of further production jobs at a separate workplace while the plant is in operation.



Data and facts:

An overview of Protecto

Lacquer applicators

DIAPHRAGM VALVE

Application procedure:	Dispensing, spraying
Track width:	2 -12 mm
Ø nozzle:	2,4 mm
Max. component height:	100 mm

JETTING VALVE

Application procedure:	Jetting, dispensing, spraying
Track width:	0,5 – 12 mm
Ø nozzle:	2,4 mm
Max. component height:	100 mm

VarioFlex CURTAIN VALVE

Application procedure:	Curtain Coating
Track width:	3 – 20 mm
Ø nozzle:	15 mm
Max. component height:	60 mm
Rotation angle:	0° + 90°

Technical specifications

DRIVE SYSTEM

3-axis system with CFRP arms and closed-loop servo motors

X-Y speed:	1 m/s
X-Y acceleration:	10 m/s ²
Z speed:	0,25 m/s
Z acceleration:	2,5 m/s ²
X positioning resolution:	10 µm
Y positioning resolution:	4 µm
Z positioning resolution:	0.25 µm
X-Y repeat accuracy:	± 20 µm
Z repeat accuracy:	± 10 µm

LACQUER SUPPLY

Dispensing pump
Bubble-free container change via special lacquer lance
Pressure-regulated cartridge holders
2K materials

TRANSPORT SYSTEM

Inline chain transport system with support of 5 mm respectively (optionally 3 mm), assembly clamping via transport chain

Width adjustment:	80 – 508 mm
Max. circuit board weight:	5 kg/m
Max. component height:	± 100 mm
Prepared underfloor return transport (further transport systems available on request)	

WORK AREA

Accessible to every lacquer applicator

With 4 lacquer applicators:	350 x 508 mm
With 1 lacquer applicator:	620 x 508 mm
Max. work area:	890 x 508 mm

Options

LACQUER APPLICATORS

Up to 4 lacquer applicators
Lacquer applicator heating
Up to 4 lift cylinders with up to 100 mm lift

FLUID

Up to 4 lacquer pumps for original container
Up to 2 lacquer cartridge holders (Euro/Semco cartridge)

MONITORING

- › Material level monitoring for original container
- › Material level monitoring for cleaning station
- › Material level monitoring for lacquer cartridge holder
- › Material volume monitoring by scales
- › Laser needle positioning system
- › Laser curtain width monitoring
- › Fiducial camera
- › Fluid pressure regulator via software



Strengthen your team

Optional products for an even better result

We want to offer our customers the greatest flexibility in the coating of sensitive electronics. That's why you can add to your Protecto plant with innovative optional equipment to make it a complete conformal coating line. The compact structure and ingenious equipment of our systems mean they can be integrated in any production line – regardless

of whether you want to produce series with a high output or small batch series with frequent changes of materials. Take advantage of our long years of experience in mechanical engineering! With our coating and hardening plants you'll be at the cutting edge of technology and ideally equipped for all requirements.

RDS 1200 UV



Rehm has developed an innovative UV dryer for hardening all UV lacquers. According to material requirement, the system is available with UV curing lamps with mercury medium pressure lamps or UV LED lamps. Its small, compact structure allows the system to be adapted flexibly to any production landscape.

RDS with infrared and/or convection



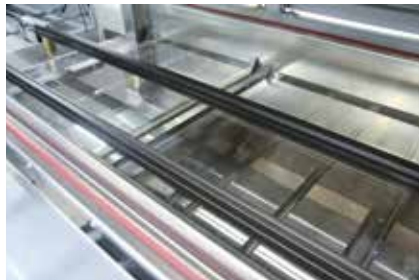
Rehm offers the RDS range for optimum drying and hardening processes. With powerful IR radiators or convection in a heating chamber, the plant dries all common lacquers fast and reliably. A glass cover over the IR radiators minimises maintenance costs.



High-performance lamps in the RDS 1200 UV for drying all UV-hardened coatings



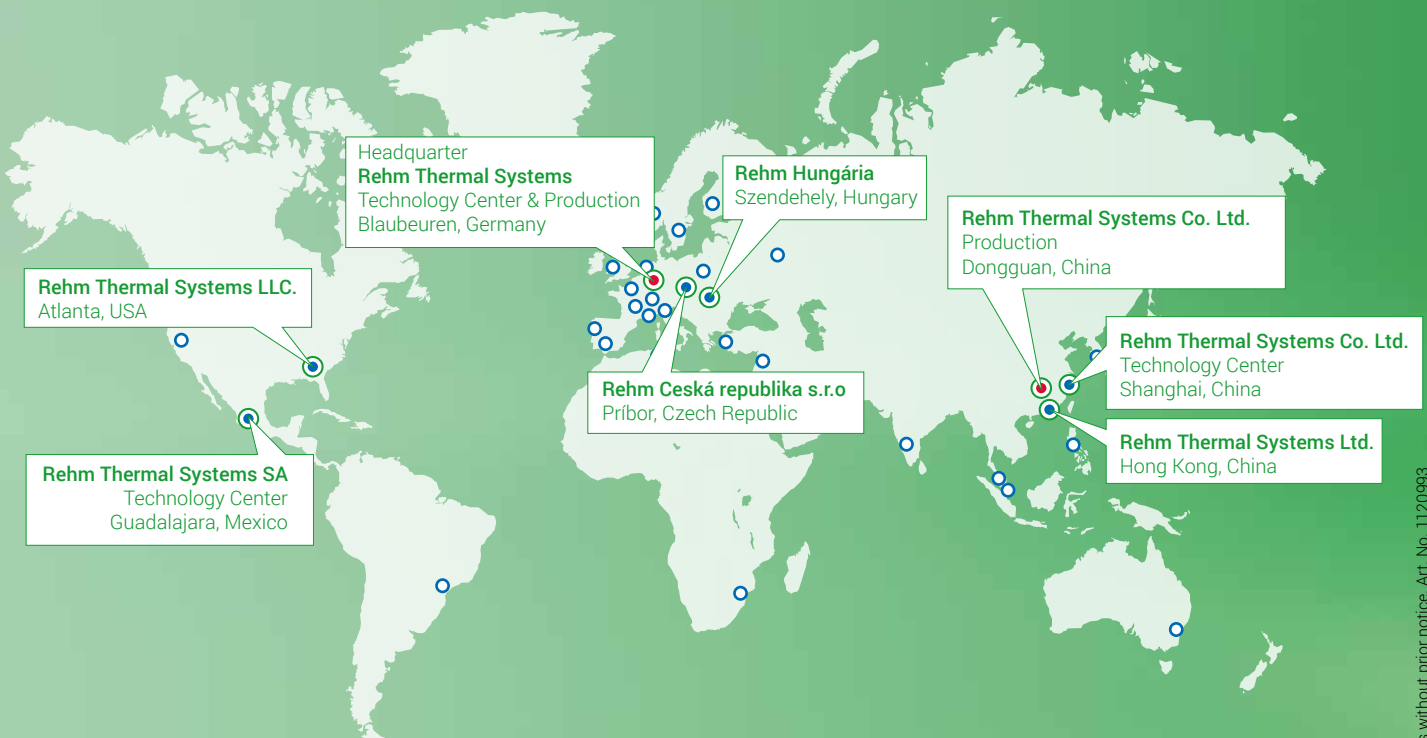
Trouble-free processing of boards with very tall components with the RDS range



Glass covering in the RDS plant for easy cleaning



THERMAL SYSTEMS



Rehm Worldwide

As a leading manufacturer of innovative thermal system solutions we have customers on every continent. With our own locations in Europe, America and Asia as well as 26 agencies in 24 countries we are able to serve the international markets quickly and to offer outstanding on-site service – worldwide and round the clock!

- Location
- Production facility
- Representation



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