

# Complete Solutions in Demand

Tool Coating



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## Masthead

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Special reprint

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When deciding to invest in a coating unit, it is no longer only factors such as layer performance and special features that are decisive. The effort is justified only if peripherals and service are also in accordance with the performance of the coating unit.



**1** TCS: Turnkey Coating System (© Platit)

TIBOR CSELLE, CHRISTIAN BÜCHEL AND ALEXANDER MOSCHKO

→ In the benchmarks, of course, primarily the coating performance and the unique features of the coating systems are compared, but in the investment decisions, the service and the peripherals also play an essential role. It also separates the wheat from the chaff.

The article introduces new components of the PLATIT coating systems, whose development requires large personnel and financial investments from

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the manufacturer but makes the operation of the coating systems much easier or even possible for the users.

**The most important elements of a complete coating system**

PLATIT is well known as a supplier of Turnkey Coating Systems (TCS) based on the four standard machines of the Series 11 [1]. These are

- the small system π111 with ø 355 mm × 440 mm coating volume,
- the medium size π411 with ø 500 mm × 440 mm coating volume and
- the large plants, πPL1011 and π1511 with 700 mm × 700 mm coating volume.

To be able to work professionally, a coating system must contain, in addition

to the coating unit and its accessories (substrate holders and handling devices), the following components (Fig. 1):

- project processing and service,
- stripping (decoating),
- pre- and post-treatment of the substrates,
- cleaning,
- quality control

**Project processing and service**

The collaborative work of the user and the supplier starts several months before the installation. The project engineer of PLATIT plans the following tasks in advance:

- The layout for the coating system according to the workshop of the user.

- The draw up the connection diagram for electricity, gas, water.
- The compile the complete documentation (recipes, training documents, manuals, etc.) according to the user's production tasks.

During installation, the operators, the maintenance staff and the department manager are trained, which usually takes about 4-5 manweeks on site of the user.

After commissioning, users and suppliers work together best in the context of service contracts. The most essential benefits of regular service are

- a high level of production reliability
- the maximized machine operating time,
- the ensurance of a constant layer quality
- the reduction of the maintenance costs.

Without false modesty one can claim that PLATIT's project and services are well above the average level, which was very often decisive in purchase decisions.

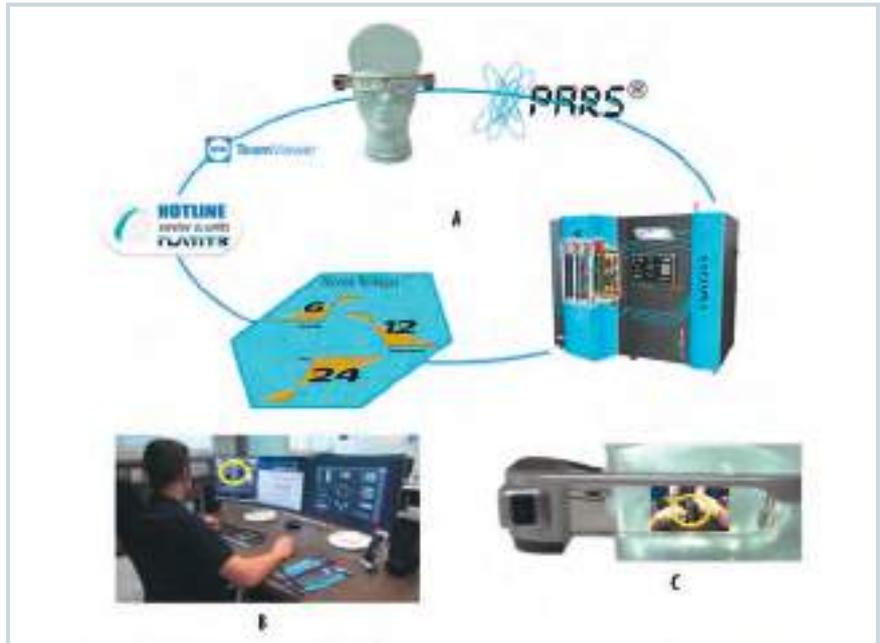
In order to further improve these services, PLATIT once again presented a world first service (for the coating industry) at the GRINDTEC 2018 trade fair; the PARS® Service (PLATIT Augmented Reality Service), Figure 2 [1].

The user and the hotline service engineer from PLATIT are visually and acoustically connected on the Internet via several channels:

- The service engineer sees through TeamViewer what the coating system is doing and can intervene in the software in real time.
- He sees by the augmented reality glasses of the operator also the events, the loading, the machine components, so the hardware.
- He can put markers, instructions and pictures in the operator's glasses to alert the operator and show him possible solutions.

### Stripping (Decoating)

The stripping of cutting tools is an important prerequisite for high quality re-coating. The conventional methods are



**2 PARS-PLATIT Augmented Reality Service** A: The on-line circle of PARS; B: The hotline service engineer is connected on-line with the coating machine and with the PARS glasses of the machine operator; C: The operator sees the markings and instructions of the hotline service engineer in his glasses (© Platit)



**3 Super-fast decoating with PLATIT's CT-Technology** E: New design of the decoating unit CT20 A: Stripping bath B: Bath for corrosion protection S: Control unit (computer) P: Pulsed power supply W: Tool holder with shank tools (© Platit)

slow and expensive. Why do we have to recoat? The reasons are obvious:

- Our resources (tungsten, cobalt, vanadium etc.) are getting scarcer and more expensive.
- The multiple use of the tools increases the sustainability.

The electrochemical decoating systems CT20 (2 basins) and CT40 (4 basins) work with a free programmable, pulsed voltage source, which is con-

trolled by an integrated computer (Fig. 3). The essential features of the stripping process [2] are the following:

- The stripping times are in the range of minutes (Fig. 4. Please note that the scale on the Y-axis is logarithmic due to the enormous acceleration of the stripping process.).
- The patented PLATIT decoating technology [2] uses a thin TiN adhesive layer.

- It provides excellent adhesion, prevents cobalt leaching and
- allows the automatic stop of the stripping process.

### Pre and post treatment of substrate edges and surfaces

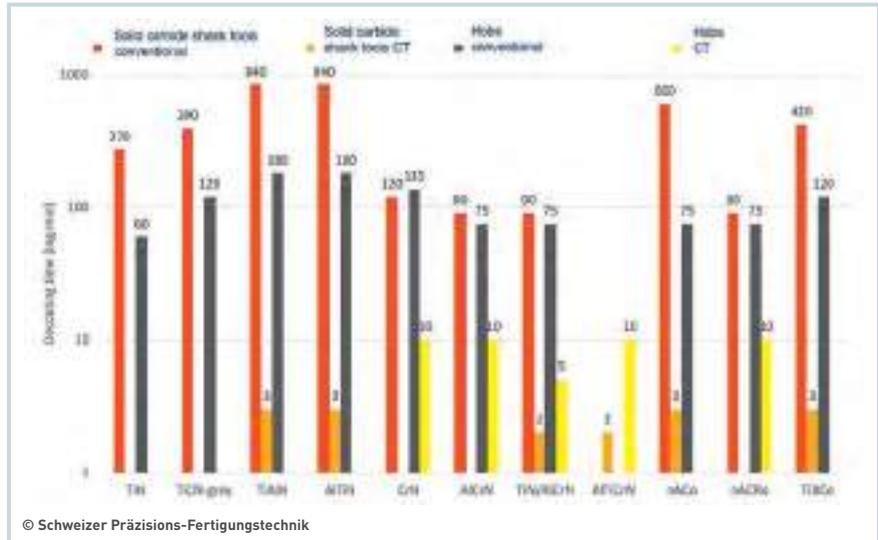
PLATIT cooperates with the best manufacturers of equipment for the pre- and post-treatment of tools, in particular of their cutting edges. Of course, the most popular methods have advantages and disadvantages. Hereby only the (in our opinion) most important applications are listed [1]:

- Brushing. [3] Particularly well suited for special tools. It makes the special targeted treatment of tool elements possible. E.g. for drills, different treatment of tip, round phase and flute.
- Drag finishing (stream finishing) [4], [5] For standard tools, the most widely used method. Low unit costs. The slow manual setup is accelerated by loading with robots.
- Micro blasting [6] The standard method for the treatment of hobs. It can also be used for standard shank tools with high productivity. Dry blasting is most often used for burr removal and for surface activation before coating. Wet blasting works with highest kinetic energy, whereby the regularly required cleaning against drying of the wet powder mixture at the plant walls, requires a considerable effort.
- Magnetifinish [7]. For micro tools the only industrial alternative. It can be used universally through very intensive further development also for standard shank tools and indexable inserts. Automatic robot loading increases productivity.

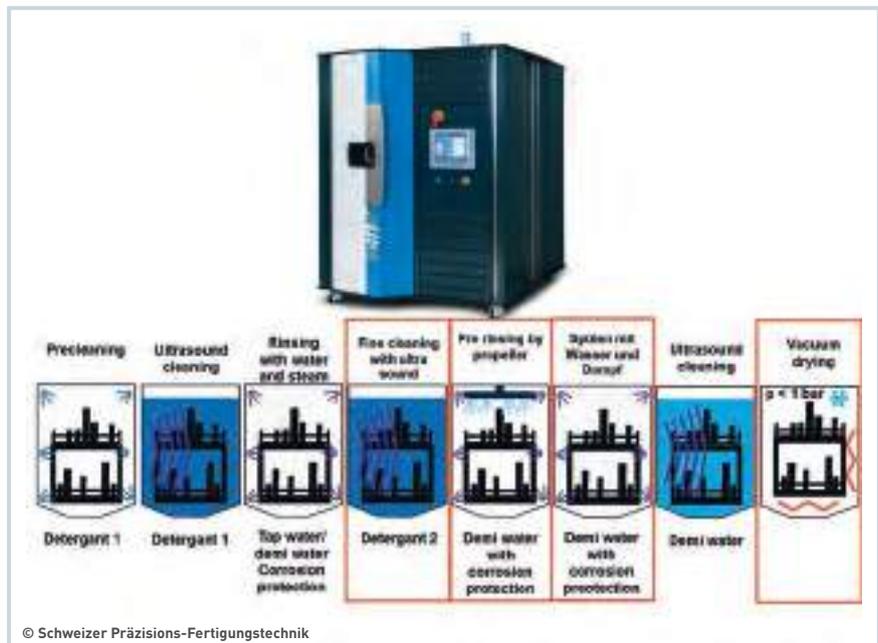
### Cleaning

When selecting the cleaning system, the “crunch question” comes up again and again: Should you decide for a cleaning line or a single-chamber system? If you examine the question through the glasses of a machine or toolmaker, the answer is very clear. The automatic single-chamber system has decisive advantages:

- Significantly lower space requirements.



4 Comparison of the stripping times with conventional and CT technologies (© Platit)



5 Single-chamber cleaning unit and its process steps, Standard steps framed in red, Optional steps not framed (© Platit)

- You do not have to worry about the chemical state of the (up to 13) chemical baths.
- For a single-chamber system, you do not need a housing with an exhaust system.
- Complete processes run automatically very fast (<1 hour).
- The new cleaning system of PLATIT, V411 has been developed in cooperation with our long-term partner, Eurocold (Vicenza, Italy) [1]. The standard cleaning process runs automatically with the following steps (see red framed blocks in Fig. 5):
- Oil separation through top-hole skimming, (For heavily soiled parts, a rough cleaning in a simple ultrasonic bath with oil separator is recommended).
- Fine cleaning with ultrasound.
- Pre-rinsing with demineralized water, which is circulated via a propeller.
- Rinsing with demineralized water and steam, with a dosage of corrosion protection for corrosion prone tools is possible and
- Vacuum drying.
- In addition, the wastewater is neutralized.



According to the customer-specific application, the cleaning system can be extended with the following options:

- Rough cleaning for very oily tools.
- Pre-cleaning with ultrasound for a 2-stage cleaning.
- Integrated water treatment.
- The flush can be additionally equipped with city water and / or a cascade system.
- A final rinse with demineralized water and ultrasound ensures perfect rinsing in mold and dies with complicated geometries.
- An ultrasonic cleaning at a second frequency.
- To reach larger and complicated substrates over the entire surface, the substrate table and / or the rinsing nozzle propeller can be rotated.
- Boosted vacuum drying can shorten the drying time.

### Quality control

The standard control over Calo- (layer thickness) and Rockwell- (adhesion) tests has now been extended to check the cutting edges. PLATIT cooperates intensively in the standards committees, so that finally uniform regulations for the measurement and evaluation of the cutting-edge profiles arise. The green print for this VDI standard [8] has been published end of august 2018.

In the interests of smaller users, cost-effective devices would be desirable. In addition to the extensive profile measurements, these should allow fast and reliable control of the cutting edges under production conditions [9], [10], [11].

### Outlook

The integration of coating systems directly into the tool production has clearly established itself in the last two decades, also in the medium-sized industry. The investment in a coating system without the strong support of

the system manufacturer especially regarding periphery and service often did not lead to the desired success. A one-man show cannot be a long-term solution. The users need

- highly flexible and efficient coating equipment, as well
- peripherals selected according to their specific applications and
- a strong support of the system manufacturer with project management and service.

Of importance is the mutual trust, the openness, so that the plant manufacturer and the user can work together on the continuous development of the products and their coating layers. ■

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Translated by Platit AG

### REFERENCES

1. Compendium PLATIT AG, Selzach, 60th edition, 9/2018
2. Wittel, B., Büchel, C., u.a.: Productive Decoating of PVD Coatings, Swiss Quality Production, Hanser Verlag, München, 2014
3. [www.mutschleredgetech.com](http://www.mutschleredgetech.com)
4. [www.otec.de](http://www.otec.de)
5. [www.platit.com/sites/default/files/pdf/stream\\_machine\\_duo-stream\\_3-20.pdf](http://www.platit.com/sites/default/files/pdf/stream_machine_duo-stream_3-20.pdf)
6. [www.graf-technik.de](http://www.graf-technik.de)
7. [www.magnetfinish.com](http://www.magnetfinish.com)
8. Standard for measuring cutting edges, VDI green printing, Frankfurt, Sept / 2018
9. [www.alicona.com](http://www.alicona.com)
10. [www.lmi3d.com](http://www.lmi3d.com)
11. [www.global.zoller.info](http://www.global.zoller.info)

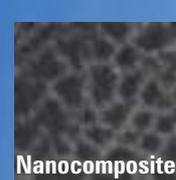


## Milestones of PLATIT-Coatings

2017  BorAC<sup>®</sup>  
BorAT<sup>®</sup>

2012  ALL<sup>4®</sup>-Tribo  
nACoX<sup>4®</sup>

2007  TiXCo<sup>3®</sup>  
nACo<sup>3®</sup>

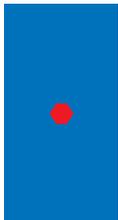
2003  nACo<sup>®</sup>  
nACRo<sup>®</sup>

1994  UniversAl<sup>®</sup>  
UniCut<sup>®</sup>  
Conventional Coatings

# Service Centers



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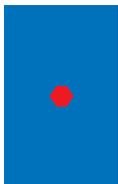


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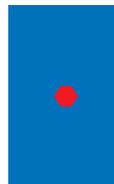


World Wide Service

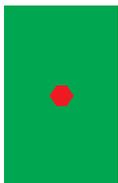
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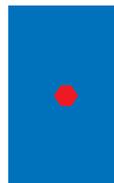
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