Swiss Quality Production

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No small amount of experts believes that the coating of a cutting tool determines up to 50 percent of its performance. Generalized in such a way, this is clearly an exaggeration, but there is also a lot of truth in it. So, it can’t be a coincidence that one of the most major trends on the market consists of integrating coating technology into the production process of the tool manufacturers. The main reason for the decision to invest in your own coating system lies in the technical and operative field: complete manufacturing, faster delivery, higher quality and better coatings, as well as simpler logistics [1]. These varied reasons are enough for a great deal of companies to decide upon in-house coating. The specific tool geometry, the dedicated layer and the production process can be developed collectively, which gives rise to an optimal and thoroughly distinct product (Figure 1) [2].

The costs, the benefit, and the efficiency of coating at large coating companies are known to be excellent. But what is it like at smaller businesses? Or in other words: at what job coating costs should small or medium-sized enterprises (SME) invest in a separate coating system? This specific question will be answered below with reference to concrete practical figures.

An effective periphery is also a must for small systems

First and foremost, the optimal size and capacity of a coating system must be selected with the quantity of tools that need coatings in mind. For example, the 11 series by the coating specialists Platit – Figure 2 shows the different variations according to user need and with this the increments – covers a very wide spectrum of users. It ranges from small regrinders to large forming tool manufacturers [3]. Needless to say, a coating system only functions with the support of the corresponding periphery, which is also evident in Figure 2.

Cooling, cleaning units and quality control systems are absolutely necessary, even at the smallest expansion range. Additionally, tools need edge preparation and post treatment units, but these are already present in 95 percent of German grinders [4]. Furthermore, a decoating system is highly recommended for regrinders [5]. This kind of periphery can serve at least three coating systems. The space requirement of a coating system for
up to three coating installations ranges from 50 to 150 m² [3].

Costs and benefits realistically weighed up
An encouraging fact beforehand: the Return on Investment (ROI) is achievable in around two years depending on the size of the installation [3]. The costs pictured in Figure 3 were calculated for a tool manufacturer that produces drills, end mills, cutting inserts and hobs, with diameters between 3 and 80 mm and lengths from 46 to 180 mm.

The fixed costs such as credits, wages, social affairs, rent and depreciation, as well as the variable costs like energy, target, gas, cleaning and decoating were considered under the following production conditions:
- two shifts of eight hours production time in the day,
- fill rate/charge 80 percent,
- possible coatings for the different systems,
- typical discounts on coatings, depending on the systems and layers and last but not least
- the supposition of half a workload in the first year.

With how many tools, or in other words, at what annual job coating costs is it worth it for a small tool manufacturer to consider investing in a coating system? In order to answer this question pragmatically, we will make another calcula-

![A turnkey coating system and its features. In focus are the coating units, for example here the 11 series by Platit; coating can be performed by the small starter model (π111) right up to the heavy-duty model (π1511) (Photo: Platit)](image1)

![Comparison of gain and investment (Return on Investment – ROI) with a coating system for in-house coating, illustrated by the example of a tool manufacturer which produces drills, cutters, cutting inserts and hobs (Photo: Platit)](image2)
The increase in PVD systems is bigger than that of job coating. Consequently, the systems are more and more frequently used for in-house coatings. In summary, we can therefore establish that in-house coating is quite rightly in trend, due to both the technical and operative, and the economical advantages.

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150,000 euros for coating companies to get into the black

The table in Figure 4 also illustrates that, according to the calculations for this case, in-house coating is profitable once job coating costs reach 150,000 euros. But the most important benefits are still the technical and operative advantages: complete in-house manufacturing done independently, being able to deliver quickly, simple logistics, better and consistent quality, and not least the exclusive and dedicated coatings. If you look at the statistics from the global PVD coating industry, you will come to the following conclusions [6]:

- The growing number of cutting materials prompts more and more dedicated coatings, which cannot practically be delivered by job coating centers.

A deciding question: At what job coating costs is in-house coating profitable? (Photo: Platit)

REFERENCES
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