At which job coating costs can a SME think about investing into a coating system?

User

150'000 €

Job coating
When can a SME think about investing into a coating system?

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The coating is one of the most important factors they determine the performance of the cutting tools. Whether its influence is more or less than 50%, we prefer to leave it open .... But the fact is that more and more SMEs decide for an in house coating worldwide.

The main reasons for this lie in the technical and operational level: Complete production, fast delivery, better quality, own layers with brand names, and simpler logistics, to mention only the most important ones [1].

These varied reasons are enough for a great deal of companies to decide upon in-house coating. Even small businesses (fewer than 20 employees) opt more and more for in-house coating and thus provide constant quality in extremely short delivery times (Fig. 1).

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 [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 question will be answered below with reference to concrete practical figures.

The technological conditions

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 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:
- chiller for 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
In order to answer this question pragmatically, we will make another calculation. The cash situation of the business is analyzed according to today’s usual leasing conditions. The following cash-relevant costs are considered:

- leasing rates, calculated using the price of the coating system (including cathodes, coating recipes, basic holders, cleaning system and a quality system), with an interest rate of 4 percent.
- labour costs, including social costs, and
- variable costs like energy, target, gas and cleaning expenses.

On the other hand, there are the costs which the tool manufacturer has paid to the job coating company. The diagram in Fig. 4 shows the negative and positive cash flow (loss and gain) which in-house coating can generate against job coating, depending on the amount of tools being coated (or the original costs for job coating).

These are already present in 95% 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 system for up to three coating installations ranges from 50 to 150 m² [3] (Fig.2).

Costs and profit

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

– 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 economic advantages.

The table in Fig. 4 also illustrates that, according to the calculations for this case, in-house coating is profitable once job coating costs reach 150,000 €.

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.

Outlook

If you look at the statistics from the global PVD coating industry, you will come to the following conclusions [6] (Fig. 5):

**References:**


Coating Units of the 11 Series

π211
The DLC³-Unit

π311
The SME System

π411
The High Performance Machine

π511
The Start-Up Equipment

π1511
The Large Plant

Coatings made by 11 Series

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