



1 Process management according to Six Sigma.

2 CoaTway® forecasting system.

OPTIMIZING PAINTING PROCESSES

Status quo

In recent years, painting has developed into an expensive production step which is difficult to control. Past and future environmental protection investments are undermining the competitiveness of painting companies. Added to this is considerable price pressure due to the current general economic situation.

The high cost pressure can be reduced by systematically identifying and exploiting rationalization opportunities (Figure 1).

We can help

Fraunhofer IPA has been optimizing painting processes and paint shops with an experienced team for over 40 years. We employ recognized testing and evaluation methods. To develop and implement the best possible solution, in consultation with you we form a project team of employees from the respective departments (e.g. pro-

duction planning, production, maintenance) and specialist companies (e.g. paint manufacturers) We select a suitable project procedure that ensures a clear overview of the extensive interdependent criteria involved in optimizing painting processes. We document the knowledge gained in each phase for you and summarize it to form a basis for decision-making. After each project phase, the next step is ascertained or objectives modified. Of course, the amount of time and money invested in the optimization work depends very much on the size and type of project. For this reason, before carrying out tests to verify the suitability of an alternative process, system or work method, we make a quick and reliable assessment of the rationalization potential of possible optimization measures. This enables new economic and ecological ways to be found without wasting time and money on testing unsuitable technologies.

With this in mind, Fraunhofer IPA has developed a computer-aided system for optimization projects (Fig. 2).

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Schwachstelle Optimierungschance	Prio.	Ursachen	Maßnahmen	Einspar- potenziale (€)
Zuständigkeit:		zu erled. von:	Solltermin:	Isttermin:
Stand der Arbeiten, Ergebnisse:				
OPTIMIERUNGSMABNAHMEN LACKIEREREI				Datum: Blatt:

3

Our approach

Fraunhofer IPA uses generally-accepted optimization methods. The Six Sigma approach established by General Electric in the 1990s centers on improvement projects that are used to optimize processes (or products) in companies. Improvements are implemented according to the so-called DMAIC cycle (DEFINE – MEASURE – ANALYZE – IMPROVE – CONTROL). Each of these project phases is supported by powerful and proven tools. Throughout the entire optimization project, the focus is always on the needs of the customer. Six Sigma projects are primarily implemented in cases where projects are relatively complex and where the classic lean approaches have already been exhausted.

Among others, we include the following aspects when recording the status quo:

- Composition of the workpiece spectrum
- Arrangement of workpieces on product carriers (conveyors)
- Description of the paint shop
- Material flow
- Paint-related data
- Key data of the coating properties
- Key data of the paint application process
- Cost of the coating process
- Current requirements

We make our on-site weak-point analysis to determine the savings potential empirically with the aid of targeted measurements or tests. Examples include:

- Spraying parameters
- Paint utilization rate
- Paint shop capacity
- Air conditions in the spray booths
- Material flow
- Required structure of the paint layer
- Thickness and distribution of the paint film
- Energy analysis
- Rework statistics

Fraunhofer IPA carries out this work using checklists, assessment methods and a comprehensive range of testing and measuring instruments.

To evaluate the status quo and assess optimization options, we prepare a detailed requirements catalog and a trend analysis.

In the catalog, the decorative and functional requirements are defined for all parts, as well as the constraints related to the paint shop and painting process. The trend analysis takes into account anticipated future developments, e.g. with regard to coating quality, parts spectrum, colors and paint structures, as well as environmental protection requirements.

On the basis of the preceding work steps, a catalog of measures (Fig. 3) is drawn up, priorities are set and time targets are defined. The anticipated savings potential of the measures is outlined. To implement the measures, we carry out systematic trials with all project members. As a matter of principle, one of our top priorities is to closely involve all employees concerned in the processes of the optimization project at an early stage. Through this, staff are more open to innovations and changes in a lasting way. The experimental trials are initially performed by us in pilot plants and laboratories. Depending on the task, training programs may also need to be developed and carried out. Fraunhofer IPA supports the implementation of the measures and monitors the progress made towards achieving your goals.

3 *Example of an action plan.*