Contents of the Seminar in Beijing, in Oct,2004

We prepare six blocks for the seminar in Beijing, in Nov,2004 as follows:

Premium Production Quality through digital methods in the coating process

Abstract:
Digital methods enter to all parts of the life of a plant: commissioning, designing, product launching, project management, optimisation, detecting defects, etc. This seminar shows how to save costs and time and improve quality at the same time in practical examples. The digital methods vary from process simulation, data management, data collection and analysis. The main examples stem from the coating process in the automotive area – a field of high automation and high complexity in respect to the physical interactions as well in the technical chains.

Seminar plan:

Block	Theme	speaker
1	Offline process-simulation	Tiedje
2	Offline programming of robot automation in a virtual digital world	Maus
5	Transparent plant	Tiedje
4	Commissioning, analysis of facilities through digital methods	Maus
3	Electrophoretic coating, pre-treatment	Tiedje
6	Optimisation	Maus

Block abstracts:

Block 1: Offline process-simulation
Process simulations are the elements of the digital plant. Here shall be shown, that quick and practice-orientated calculations give high benefit for design and optimization nowadays on the one hand and will be a part of the complete digital plant in the future on the other hand. The approach is the combination of system know-how, process modelling and simulation calculations. As examples we will show the main concepts in the highly complex coating process. We will use the mathematics of rate equations, electromagnetic calculations and high dimensional integration. The physical background is mainly hydrodynamics and electromagnetism

Block 2 Offline programming of robot automation in a virtual digital world

Nowadays, the commissioning of new plants or the commissioning of new robot programs has to be performed in high quality within a very short project time window. To accelerate the commissioning it has become necessary to develop and simulate new paint processes in the virtual digital world in advance. The spray coating process is known as one of the most complex production processes. Therefore, we will demonstrate the advantages of offline programming in the automotive coating

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industry. For example, the possibilities to match the paint robot kinematics perfectly adapted to the specific shape of different car types will be highlighted. In addition, the precious capabilities of digital process development taking into account the special knowledge of the complex production processes will be revealed.

Block 3: Electrophoretic coating, pre-treatment
One necessary condition for the digitalization of a plant is to know all data of existing plants. Therefore the process data have to be collected and to be automatically analysed. With these information it is possible to have a virtual equivalent of the plant to detect defects and to optimise the facility. Furthermore this is the foundation of the designing the digital factory. We will show examples for detecting faults digitally, for getting transparency in the plant and for optimisation of the facilities on the background of achieved and digitally analysed data.

Block 4 Commissioning and industrial facility improvements through digital methods

The application of sophisticated methods and high-end equipment by highly-qualified specialists is very valuable for improving industrial processes very rapidly. Very important is the Know-How transfer and transparency of the achieved improvements which can be provided through the use of modern digital methods, data acquisition and the associated statistical analyses. We will show how the application of such digital methods which we adapted to different production fields, to various machine types and to specific process conditions help to analyse processes, to detect malfunctions, to accelerate commissioning, to improve machine performances and to provide transparent insights into technical details as well as to transfer an understandable overview about the total production process.

Block 5: Transparent plant
The first two steps in coating process are generally pre-treatment for cleaning and the electro coating for corrosion protection. The digital methods applied in the fields are various methods of measurement, simulations of layer-thicknesses and filters, complex control systems and statistics. The measurements and achieve process data can effectively combined to optimize the process. In this part of the seminar we will introduce the technical aspects of these parts of surface treatment and show how to apply digital methods.

Block 6 Optimisation of automated production spray coating processes with tailor-made digital tools

Coating processes in the automotive industry require highest quality standards. The challenge is on the one hand to achieve such a high production standard and, on the other hand, to stabilize the achieved standard over a production lifetime of several years. Therefore, it is of advantage to establish a high standard within a process window as large as possible. The approach to such a high standard can only be achieved by a systematic optimisation proceeding. A highly systematic and successful approach is supported by the use of digital software tools consisting of capabilities such as digital process engineering, complex process data linking,

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modern data management, intuitive data visualisation, data analyses, data optimisation and efficient optimisation and data documentation. We will demonstrate how systematic quality optimisation have led to premium coating quality by the combination of the leadership of coating process specialists together with such tailor-made digital tools.

Case Studies:

The projects realised by syspilot Industry Consutling for various customers , such as , DaimlerChrysler, BMW, BASF, Dürr , Nedcar, Volvo, Mitsubishi, Smart, Brose and peguform.

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