



ASSEMBLY PLANNING

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www.ipa.fraunhofer.de/en/assembly_planning

This might also be of your interest:

Modular, reconfigurable assembly systems,
more info below:

www.ipa.fraunhofer.de/en/matrix_assembly

Automate assembly, more below:

www.ipa.fraunhofer.de/en/assembly-automation

Current situation

Competitive assembly systems have to withstand a volatile business environment: fluctuating quantities, high numbers of variants and a general uncertainty about future developments push conventional planning concepts to their limits.

At Fraunhofer IPA, we pursue the approach of designing assembly structures so that they can be adapted to changing conditions during their life cycle.

We take a holistic approach, meaning that related processes such as logistics and material supply are also included in the design. The focus is not only on planning new assembly lines but also on optimizing existing assembly structures.

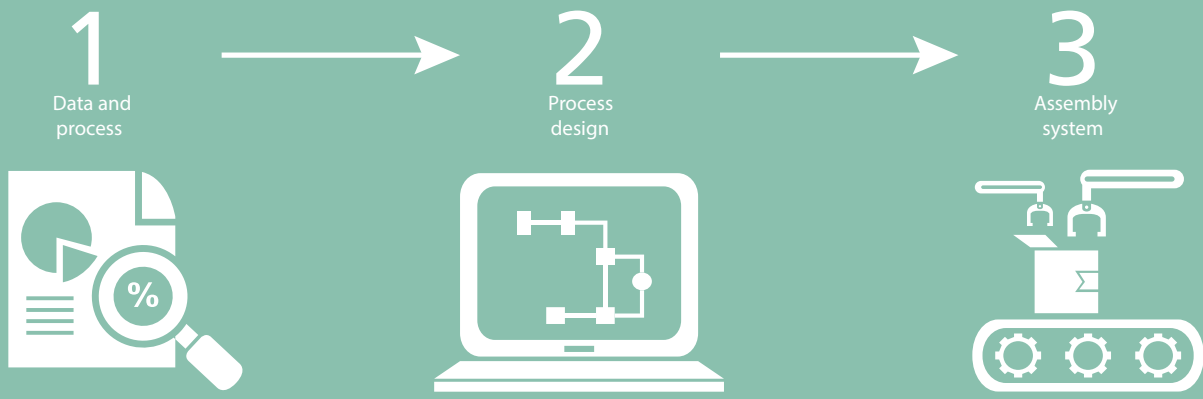
Our approach

Data and process recording

To start with, we make an in-depth, variant-specific analysis of the products to be assembled and the related processes.

This information is as well as for the related processes. Possible variants are analyzed and their impact on technologies and assembly processes is visually mapped in variant trees and priority graphs.

If an existing assembly system should be improved, process times and value-adding potentials can get recorded and evaluated by our video tool for waste analysis or our plug & play sensor system for AI-based process analysis. If, on the other hand, a new assembly system is being planned, we implement common time management methods to calculate your time modules on the basis of variant supplements.



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By combining our Design for Automation method with an analysis of the automation potential, we identify ways of improving the design of your products.

Process design

Following the determination of product and process requirements, the designing of the process sequences can start. Designing manual processes, equipment and devices is as much a part of Fraunhofer IPA expertise as selecting standard automation solutions or developing and testing customized automation systems. When selecting optimal assembly process sequences, we focus on the technical and economic aspects.

Planning the assembly system

After choosing the optimum assembly process sequence, the next step is to plan the assembly system itself.

We select the most suitable structure for you from the many available layout types, such as line, row or group layout, or the emerging concept of matrix production system. The decision also takes possible future requirements into account, thus ensuring the flexibility, scalability and versatility of the assembly system.

This is followed by capacity planning and distributing the assembly contents among the system's various workstations.

If assembly systems are linked in a line, we apply the classical principles of lean production (lean line design). Freely-interlinked assembly systems are planned with our own process-oriented planning methods developed in-house.

The integrated logistics planning encompasses not only the design of the material supply to the workplace but also the transport of products and waste materials away from the workplace.

This involves selecting an appropriate material supply strategy, determining the necessary storage levels and designing the appropriate means of transport.

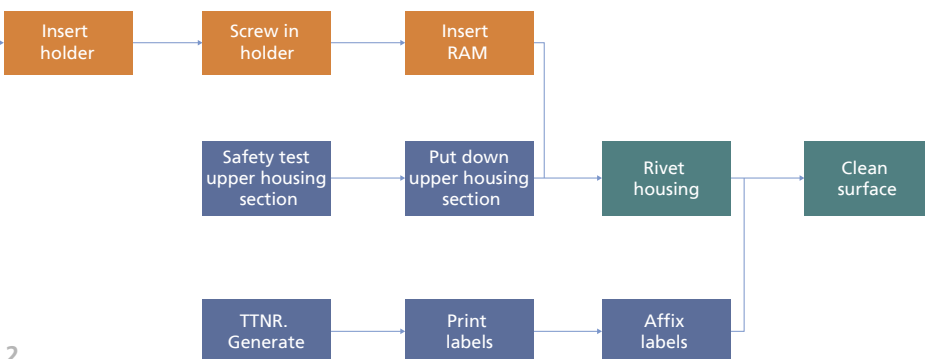
Thanks to material flow simulation, processes can be validated in advance and, if required, optimized before being physically installed and put into operation.

Your advantage

You receive a holistically planned assembly system which contains flexible elements enabling easy adaptation to changing requirements. We offer you a methodical planning concept based on extensive experience from numerous applications in industrial projects. Both, technical and economic criteria and objectives are taken into account. Layout and workplace design can be planned in great detail, also in CAD, enabling direct implementation. We validate our planning solutions in material flow simulations and, if required, also provide support during the installation process of the system. Thus, from the design of the concept to its smooth implementation, you can be assured of a state-of-the-art assembly structure that meets both current and future requirements.

Feel free to contact us and let us plan your installation – productively and cost-effectively.

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1 Assembly planning approach.

2 Example of an assembly priority graph.