Assembly Planning and Validation

Benefits
• Deliver high quality products right the first time
• Streamline the assembly planning process and reduce its duration
• Shorten production setup and enable faster rampup
• Resolve product assembly issues during process authoring
• Improve communications between design and manufacturing teams
• Better understand the impact of product changes on the assembly process
• Utilize more standard processes and maximize the re-use of assembly solutions from previous programs
• Reduce future capital investment by re-using existing production resources
• Automatically validate assembly and disassembly processes
• Reduce tool installation time
• Minimize system try-out costs
• Improve time to volume
• Facilitate assembly line flexibility
• Provide more accurate assembly work instructions
• Optimize resource utilization

Summary
Tecnomatix® Assembly Planning and Validation software provides an end-to-end solution to collaboratively design, validate, optimize and document your assembly processes. The solution enables you to leverage a single source of product and manufacturing knowledge and drive a design-for-assembly strategy. Re-use of standard and proven assembly processes shorten your planning efforts. You can validate your assembly plans in a 3D environment to increase your productivity during the planning phase. In addition, you can improve the productivity of your assembly process by optimizing it up-front at the start of production.

A collaborative solution for planning and validating your manufacturing assembly processes
Tecnomatix Assembly Planning and Validation enables you to evaluate different assembly alternatives, coordinate resources, optimize throughput, plan for multiple variants and efficiently manage change across your entire assembly process lifecycle. As a result, you can reduce your planning process, shorten production setup, achieve faster rampup and deliver quality products right the first time.

Assembly Planning and Validation is a solution comprised of four key capabilities, including:
• A synchronized process-driven design environment that facilitates communication between manufacturing and design. This environment allows your company to fully understand the impact of product changes on the assembly process. Product assembly issues that arise during the process design can be communicated back to product engineering for review and adjustment of the product.

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Features
Synchronized process-driven design
• Single source of product, process, resource and plant information
• Intuitive user interface to perform quicker and more accurate planning analysis
• Collaboration environment for cross-team communications
• JT™ visualization of parts and resources
• Process modification based on product and requirements changes
• Control of information flow through change management, revision control, classification and workflow capabilities
Commonality and re-use
• Process plan authoring via best-in-class templates
• Resource classification and management to define plant and resource structure
Assembly validation
• Simulation of assembly sequence, human and machine interaction
• Web access to assembly information (e.g., work instructions)
Process optimization
• Line balancing for multiple product variants
• Time management to reduce non-value-added processes
• Ergonomic optimization of workplaces and stations
• Report tracking for resource utilization

• Commonality and re-use capabilities that facilitate the utilization of standard processes and resources as well as maximize re-use from previous production programs. These capabilities significantly reduce future capital investment and shorten assembly planning activities and its related costs.
• Comprehensive set of assembly validation tools that enable smooth production setups and flexible line tuning, which leads to reduced system try-out costs.
• Make smarter manufacturing decisions during the planning phase, which is where 80 percent of your manufacturing costs are established. Assembly Planning and Validation enables you to start this optimization in tandem with lean manufacturing initiatives on your shop floor.

Today’s assembly process challenges
Today, product design and manufacturing process planning are generally performed independently and within their own time line. This traditional approach results in long engineering processes and assembly issues that arise during production setup and rampup.

Product changes are introduced throughout the process’ design phase until the start of production. The lack of communication between product engineering and manufacturing process planning frequently leads to postponed or hasty production launches.

Similarly, the inability of product design and manufacturing engineering to work together effectively inhibits many companies from maximizing the re-use of proven assembly solutions in new product introductions. This failure causes companies to unnecessarily create manufacturing processes from scratch and leverage existing capital investment ineffectively – thereby directly affecting their financial bottom line.

The Assembly Planning and Validation solution allows you to establish best-in-class production strategies for an entire manufacturing process lifecycle that runs from process planning and detailed engineering to full production. Four key capabilities distinguish this end-to-end solution.

Synchronized process-driven design environment
Companies that synchronize their product design and manufacturing planning processes are able to design their products, taking the constraints of production into account. This approach enables companies to avoid the costly delays associated with both unnecessary design revision and assembly change.

By connecting your product engineering, process planning, industrial engineering, layout design and project management teams into one virtual environment, the Assembly Planning and Validation solution enables these groups to collaboratively plan, author, validate and optimize your manufacturing assembly processes.

Leveraging Siemens PLM Software’s open JT-based visualization capabilities allows you to establish a continuous data flow from product development through process planning to execution.
You can use the solution to author assembly processes based on your most current product data. You can establish and re-use best-in-class processes for future manufacturing programs by defining process templates. Basic product lifecycle management (PLM) capabilities – such as change management, revision control, classification and workflow – enable you to distribute information across your enterprise.

Manufacturing engineers can use the solution’s collaboration capabilities to communicate assembly requirements back to product engineering and facilitate design-for-assembly. Similarly, product engineers can use the solution to show the impact of a product design change to your assembly process.

**Commonality and re-use capabilities**
Creating manufacturing processes from scratch is a time-consuming activity that requires in-depth validation of each process. Companies that frequently use standard processes and maximize the re-use of proven assembly solutions are able to shorten their assembly engineering process and gain a faster return on their process innovation investments.

Assembly Planning and Validation leverages Teamcenter® software – Siemens PLM Software’s digital lifecycle management solution – to bring a single source of product, process, resource and plant information to your go-to-market teams.

You can use this single source of knowledge to quickly locate standard assembly processes and tools used in earlier programs. Then you can evaluate the chosen processes and tools with your latest product variants using the solution’s automatic assembly and disassembly capabilities. These validation tools help reduce workload while ensuring that all of your processes are properly validated and approved.

**Comprehensive set of assembly validation tools**
Companies that digitally validate their production systems are able to reduce tool installation time and minimize their system try-out costs. This approach significantly improves time to volume.

Assembly Planning and Validation provides the industry’s most comprehensive set of general assembly tools to facilitate process design, bill-of-material alignment, time management, line balancing, automatic assembly/disassembly, 3D layout planning and other planning and validation tasks. In addition, you can use Assembly Planning and Validation’s process simulation capability to validate your assembly sequences, as well as human and machine interaction.

**Early assembly process optimization**
Assembly Planning and Validation enables you to digitally optimize your assembly processes and thereby increase assembly productivity. Optimizing the assembly process upfront at the start of production is highly valuable because 80 percent of your manufacturing costs are determined during the planning phase.

Improving resource utilization and optimizing your assembly process times provide a foundation for implementing lean manufacturing initiatives on the shop floor.

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