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Industry insights

Accelerate agricultural machinery design with Solid Edge

Siemens Digital Industries Software

Agricultural machinery and equipment manufacturers face pressure to improve the speed and efficiency of their engineering processes so they can deliver new products on time and meet their customer's expectations for high-quality, reliable equipment that can withstand harsh environments. Siemens Solid Edge® software provides next-generation technologies that solve today's toughest product development challenges. A 3D computer-aided design (CAD) software platform, Solid Edge creates digital models that allow you to visualize and validate ideas, reducing the need to build and test physical prototypes and improving your product development performance.

Solid Edge enables farming and agricultural machinery manufacturers to rapidly digitalize their product development processes, a fundamental step in moving to a digital enterprise. Digitalization efforts help these

manufacturers respond to major industry trends that threaten to disrupt their businesses, such as:

- Increasing demand for reliable, low-cost equipment that minimizes capital expenditure and running costs
- Increased use of sensors and geolocation to improve farming efficiency, and a corresponding increase in electrical content
- Global competitive pressures from new low-cost providers in fast-growing countries with lower employment costs
- Rising material and energy costs that threaten manufacturers' profit margins

To respond to these trends and succeed in the competitive agricultural machinery market, manufacturers can improve their performance by creating and using 3D digital models for these key processes:

The Solid Edge advantage

- Meet increasing demand for machinery with shorter product development times
- Support innovative machinery and equipment design with powerful, flexible 3D design tools
- Facilitate feasibility studies with rapid 3D modeling to assess new product designs and configurations
- Easily integrate standard and catalog parts from external suppliers into your designs
- Perform virtual testing of your designs to eliminate interference between moving parts, and minimize manufacturing issues
- Optimize designs for high performance and durability while minimizing material costs

Solution focus

The Solid Edge advantage continued

- Reduce end-user operating costs with efficient machine designs
- Demonstrate compliance with government and industry regulations with secure document control and electronic workflow management and signoffs
- Improve customer service by providing high quality, illustrated maintenance documents and maintaining accurate as-delivered BOMs

Visualize new products

Substantially improve how you showcase designs before product manufacturing. Photorealistic 3D renderings and animations can communicate innovative features to potential customers, quickly conveying the value of the design and potentially selling the product before it is built. Solid Edge even offers the ability to showcase designs through augmented reality, so customers can view products in real-world settings.

Perform feasibility studies

Assess the feasibility of new products and sourcing components and sub-assemblies from external suppliers. Being able to quickly and accurately understand the impact of using new components and changing configurations accelerates the product development process. Unique synchronous technology in Solid Edge allows you to treat multi-CAD data as native files, enabling seamless collaboration with suppliers and partners.

Accelerate mechanical design

Support innovative machinery and equipment design with powerful, flexible 3D design tools. Solid Edge provides a complete software portfolio to speed the design of complex parts and

assemblies and to eliminate errors prior to manufacturing. The CAD software allows you to work directly with the design's geometry and make changes instantly, quickly producing accurate 3D part models and assemblies that enable you to deliver products sooner.

Reduce customized content

Configure standard products to meet specific customer needs while minimizing the need for one-off customized product development. Solid Edge enables you to manage product configuration throughout the sales cycle, including selecting the optimum configuration based on experience and standards. This reduces risk by enabling you to fulfill more orders with standard, predictable product configurations.

Integrate electrical and mechanical domains

Overcome electromechanical design challenges that arise from including electrical components, such as sensors, actuators and GPS systems in your designs. Solid Edge Electrical Design software modules seamlessly communicate changes between mechanical and electrical environments. The electrical computer-aided design (ECAD) tools contribute connectivity information for



wiring and board schematics while the mechanical computer-aided design (MCAD) software routes wires, cables or harnesses through the 3D physical space. This type of collaboration, which includes validation of electrical circuits, cross-probing and cross-visualization, enables faster and more accurate design.

Design frames and weldments faster

Accelerate the creation of rigid frame structures and weldments using process-specific applications. Solid Edge includes embedded engineering process knowledge, along with structured workflows, that enable faster design. Frames and weldments are fully associative with Solid Edge assembly, part modeling and drafting capabilities. Advanced memory management techniques allow you to easily manage large assembly models with unprecedented speed.

Streamline sheet metal guarding and housing design

Streamline sheet metal design to reduce costs and delivery time. Solid Edge includes sheet metal specific features, such as emboss, dimple, drawn cutout, bead, contour flange, straight brake and etch, and unique functions for complex modeling efforts, such as the ability to easily design enhanced lofted flanges and relieve bend bulges. Built-in intelligence saves time by automatically calculating material treatments and validating parts for manufacturability. The ability to create manufacturing-ready sheet metal flat patterns and nest complex shapes efficiently helps eliminate scrap and improve manufacturing productivity.

Simulate designs for validation and verification

Validate and improve performance with scalable simulation tools that use virtual prototyping and integrated motion and vibration simulation. Finding and resolving issues prior to manufacturing results in significant reductions in costs and time. Virtual testing can be used to



eliminate interferences between moving parts and minimize manufacturing issues. The integrated analysis capabilities of Solid Edge Simulation optimize designs for high performance and durability while minimizing material costs.

Optimize manufacturing processes

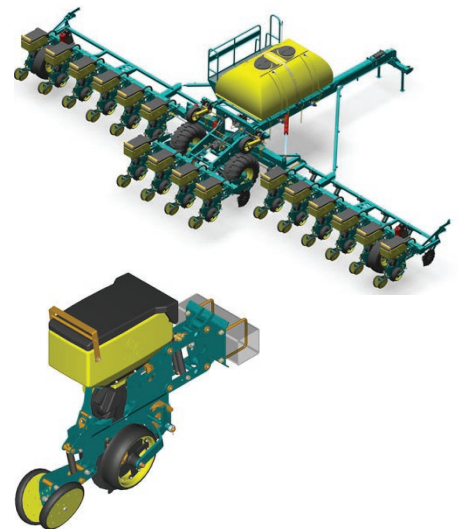
Manufacture accurately and efficiently to complete the job right the first time. Easy-to-use, learn and deploy solutions optimize manufacturing processes to maximize machine tool value, accelerate production and reduce errors. Solid Edge solutions feature a capable, proven set of tools that define and execute a wide range of manufacturing processes including CNC machining, nesting, cutting, bending, welding, assembly and additive manufacturing.

Comply with industry regulations

Demonstrate compliance with government and industry regulations with secure document control and electronic workflow management and signoffs, which can help demonstrate compliance with government and industry regulations by providing complete traceability. As a result, you have reliable audit results and a reduced risk of litigation.

Manage projects and changes

Retrieve data quickly, optimize resources and manage engineering changes efficiently for faster completion of design projects. The design management capabilities in Solid Edge provide a visual approach to managing complex design data, including the ability to manage standard parts.



Key solution components

- Solid Edge Mechanical Design for 3D part and assembly design using synchronous technology – speeds revisions and improves the re-use of proven components in new designs
- Solid Edge Electrical Design for the design of wiring, cables, bundles and printed circuit boards – enables true electromechanical co-design collaboration
- Solid Edge Simulation for digital validation of critical components – reduces the need to create physical prototypes, lowers material/testing costs and improves reliability and durability
- Solid Edge Manufacturing for definition of accurate machining, fabrication and assembly processes – improves overall efficiency with additive and subtractive manufacturing
- Solid Edge Technical Publications for creating illustrations and technical documents – communicates manufacturing, installation and maintenance procedures globally
- Solid Edge Data Management for searching, managing and sharing of product data – improves collaboration within the design team and with other departments, suppliers and customers
- Solid Edge Cloud Collaboration – online CAD management, viewing and collaboration



Access models on the go

Access design, installation and maintenance information while working on the shop floor and at remote locations. Solid Edge follows you wherever you go with mobile viewing of complete digital definitions of parts and assemblies including annotated 3D CAD models, which can be easier to understand than complex 2D drawings. And, with Solid Edge Portal, you can visualize and mark up CAD data created in many different formats and collaborate easily with suppliers and customers.

Realizing significant benefits

Machinery manufacturers who use Solid Edge consistently achieve significant benefits from designing their equipment in 3D. Solid Edge integrates seamlessly with a portfolio of affordable, easy-to-use software tools that address all aspects of the product development process, from 3D mechanical design to electrical design, simulation, manufacturing and more, assisted with integrated data management along the way.

Some examples of the benefits achieved using Solid Edge include:

- 75 percent faster completion of design changes
- 70 percent reduction of development time for new machines
- 33 percent decrease in time to market
- 30 percent decrease in manufacturing lead time
- 20 percent reduction in manufacturing costs
- Moving from concept to manufacturing drawings in 1/6 the time
- Reducing rework rate from 20 to 2 percent

For more information on how Solid Edge can enable faster design processes, see:

www.solidedge.siemens.com/en/industries/agricultural-machinery/

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