

SOLIDWORKS

# IMPROVING CONCEPT TO MANUFACTURING WITH SOLIDWORKS 2020

How SOLIDWORKS 2020 delivers a range of new  
tools to empower engineers

THE CALL FOR PERSISTENT  
IMPROVEMENT

MANIPULATING  
ENORMOUS DRAWINGS AT  
LIGHTNING SPEED

BUILDING COMPLEX  
GEOMETRY AND ORGANIC  
SHAPES EASILY

ACCELERATING PROCESSES  
AND INCREASING  
PRODUCTIVITY

ACCURATELY MODELING  
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SUMMARY AND  
CONCLUSIONS

## THE CALL FOR PERSISTENT IMPROVEMENT

Make no mistake: product development is changing. Schedules are shortening. Budgets are tightening. The number of stakeholders is rising. This is the new dynamic for those designing products; be ready for change.

That, of course, means that the needs of today's engineers are not static. They are changing, shifting, and evolving. Today, they need tools to do things faster and easier. As a result, no CAD provider can sit on its laurels. There is an obligation for their tools to become faster, more accurate, and easier to use. Engineers still have unmet needs. That won't change going forward.

All that is driving SOLIDWORKS to get dramatically better. And in the 2020 release, it has. With the latest release of SOLIDWORKS, engineers can open and modify massive drawings quickly and easily. They can build out complex geometry and organic shapes intuitively. They can collaborate, review, sign off, and execute processes more quickly. They can accurately model and securely protect designs more easily. And those represent just a fraction of the enhancements in this latest release.

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# MANIPULATING ENORMOUS DRAWINGS AT LIGHTNING SPEED

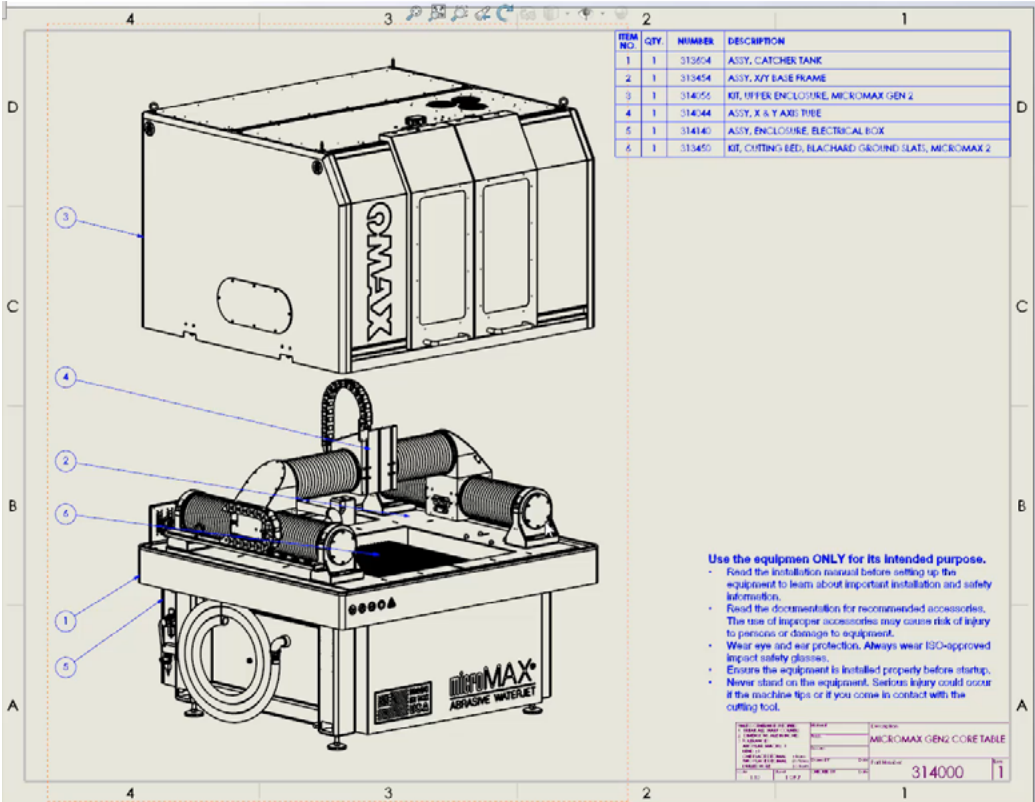
The design cycle requires a lot iteration, experimentation, and exploration to narrow in on the best designs. However, when you hit the design release deadline, you'd better have drawings. Engineering documentation is the hard deliverable that fuels many development processes, including procurement's quote requests, manufacturing's tooling design, machinist's generation of toolpaths, and inspection's quality checks. All of development grinds to a halt without drawings.

Over the last decade, engineering documentation has become more complex. Drawings contain several hundred, if not thousands, of entities like lines, arcs, dimensions, notes, title blocks, and more. All too often, CAD applications bog down considerably as they strain under the load of all that information. The drawing might take ten minutes or more to load. Simple changes might take several minutes while the CAD application catches up. Poor drawing performance threatens an engineer's ability to meet today's tight deadlines. To get things done promptly, engineers need to open and modify large, full-fidelity drawings quickly and easily.

Rapid responsiveness for large drawings is one of the biggest breakthroughs of SOLIDWORKS 2020. Using fundamentally new algorithms under the covers, SOLIDWORKS 2020 opens extremely large drawings at lightning speed. Once opened,

engineers can make swift changes to drawings containing thousands of entities. No special tricks or techniques are needed. SOLIDWORKS 2020 is simply insanely quick with huge drawings. There's no lag. There's no bog down. There's no waiting.

Drawings are the core deliverable that powers many development processes. Engineers simply can't afford to wait anymore. SOLIDWORKS' improved performance with gigantic drawings can help engineers get their time back while meeting today's tightening deadlines.



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# BUILDING COMPLEX GEOMETRY AND ORGANIC SHAPES EASILY

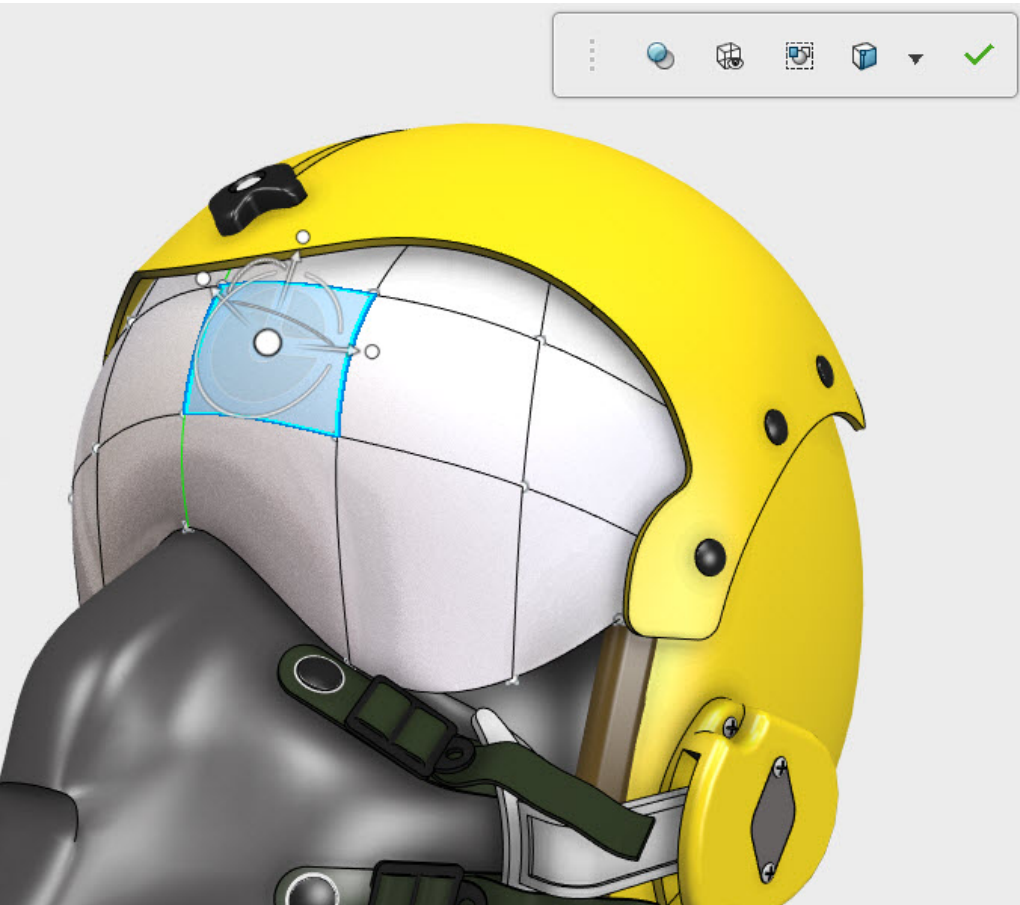
Today, there is no shortage of challenges for engineers. Calls for more aesthetic products result in the need for more organic shapes. The burgeoning use of topology optimization generates wildly non-prismatic geometry. Reverse engineering three-dimensional scans produces unruly forms. None come with handy features controlled with parametric modeling. None can be tamed with direct modeling.

The price of dealing with more geometric complexity is steep. Remodeling these shapes is a tedious, time-intensive task. It undermines productivity and steals the opportunity to design. Recreating something that already exists is a non-value added task in the development process. Any change kicks off the whole cycle again, forcing engineers into repetitive, difficult remodeling.

Two new apps—3D Sculptor and 3D Creator—have launched to address these challenges. 3D Sculptor is a web-browser based, 3D subdivision (sub-D) modeling solution for creating stylized, organic, and ergonomic models rapidly and effortlessly. 3D Creator is a web browser-based 3D concept modeling solution that allows users to create concept models. Both are fully interoperable with SOLIDWORKS Desktop and other 3DEXPERIENCE apps. A change made in one shows up everywhere. Between 3D Sculptor, 3D Creator and SOLIDWORKS, industrial designers, digital sculptors, and engineers can create the right geometry based on needs. Engineers can experiment with more complex geometry in an organic way with 3D Sculptor. Industrial designers and digital

sculptors can work with production CAD capabilities in SOLIDWORKS. Additionally, both of these cloud-based apps power more collaboration inside and outside the company. Inviting someone to provide feedback or sign off on a design is as easy as sharing a link. Engineers can now verify designs with customers, suppliers, machinists, tool designers, and anyone else—inside or outside of the organization.

Today’s geometry is getting more complex. SOLIDWORKS 3D Sculptor and 3D Creator provide engineers with the right capabilities to still get things done quickly.



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There’s little doubt about it: development is becoming a more collaborative process, especially during the design cycle. Project managers and executives need visibility into design progress. Machinists need to weigh in on the manufacturability of components. Tooling designers need to request tweaks to reduce mold costs. Procurement agents need to suggest swapping parts out for lower-cost functional equivalents. And more and more, some of these stakeholders don’t even work for your company. Rather, they are contractors or part of an extended supply chain.

Today, getting all these people involved is based on email. An engineer attaches a model to an email and sends it out to a group. Some misplace it. Some miss or forget it. Some provide feedback in the email and not on the design. Soon enough, the deadline for feedback has come and gone. The engineer is left with a mess. They have to chase down reviewers and approvers. They have to cobble together feedback that isn’t in the context of the design. They have to manually rationalize it all into a single design update. This jumbled, disjointed process too often results in delays and errors with serious implications on development timelines.



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SOLIWORKS 2020 provides brand new ways to collaborate with anyone inside or outside your company through a direction connection with the 3DEXPERIENCE apps. This allows you to quickly and easily share your designs, documents, spreadsheets, PDFs, and far more by sending them a link. No special apps are needed to open these deliverables. They open in a browser. From there, any stakeholder can add comments, mark up designs, or interrogate the model. This delivers a faster, easier, and more secure means of collaborating with everyone across the development process.

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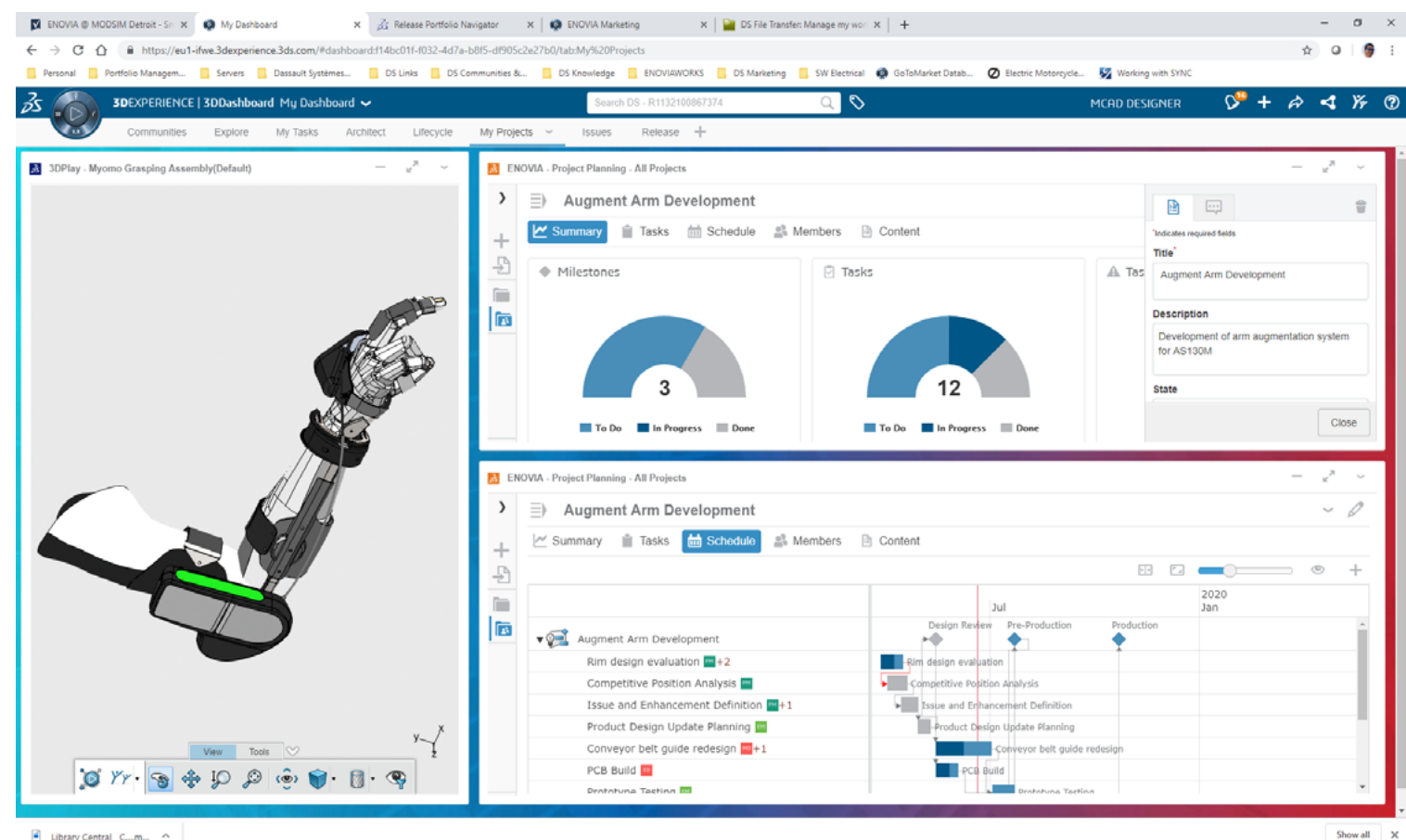
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## ACCURATELY MODELING AND SECURELY PROTECTING ASSEMBLIES

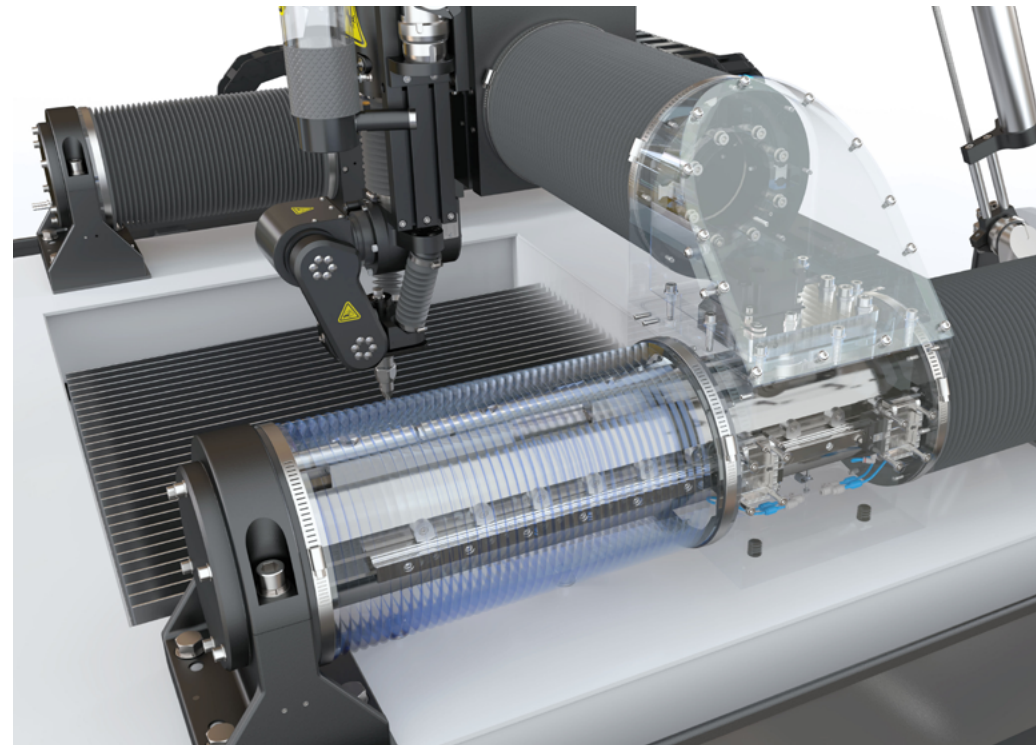
Today, 3D models are firmly ensconced in the design cycle. They act as the basis for drawings where they can be used to automatically generate views and display dimensions. They empower the exploration of new designs through parametric changes. Perhaps most importantly, they allow engineers to assess and check the physical traits of a design in the digital realm, long before any money is spent building a physical prototype. That includes calculating moments of inertia and checking interferences.

Unfortunately, accurately modeling assemblies falls short when it comes to flexible components. These parts, which physically change in length, width, and height in the real world, must be modeled as static geometry in 3D models. That throws off mass properties, such as moments of inertia, and undermines interference checks because the geometry isn't accurate. SOLIDWORKS 2020 provides new ways to model these kinds of parts. With flexible components, engineers can specify how a component flexes and changes during the product's operation. During design changes and movement of the product, these parts change per the engineer's intent.

A separate but related issue exists when trying to protect 3D models. Modern designs capture so much detail and design intent that they can easily use to duplicate products. Engineers must take steps to protect their intellectual property (IP). On the other hand, collaboration with external stakeholders is becoming critically important. Experts in machining, tool design, and design in the supply chain can contribute significant value

by weighing in early on designs. How does an engineer facilitate such teamwork while still protecting his company's IP?

SOLIDWORKS 2020 has a new capability to solve this specific problem: publish envelopes. This functionality allows an engineer to publish a component as a new envelope model, controlling what geometric details are included. They can remove holes, fill in voids, and more. However, just as importantly, the engineer can embed the original model's mass properties into the new envelope model. This allows everyone to use the envelope model and still calculate accurate mass properties for higher-level assemblies and the overall product. Accuracy and security are two critically important pieces of any successful product design cycle. SOLIDWORKS 2020 provides both with flexible components and envelope models.



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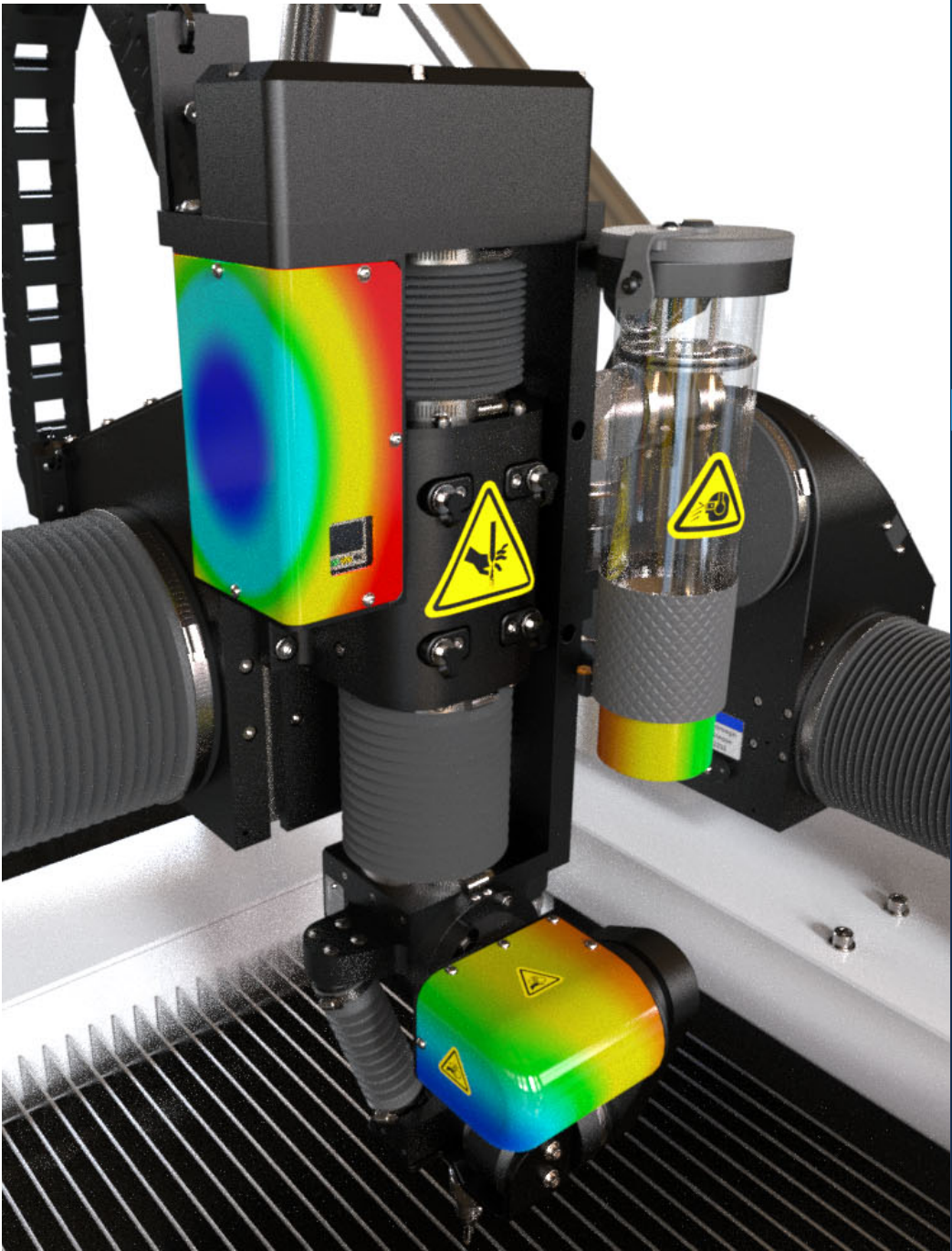
Today, engineers need new CAD capabilities to build more innovative designs more quickly than ever before. SOLIDWORKS 2020 furnishes a wide range of new functionality to do exactly that.

Using fundamentally new algorithms under the covers, SOLIDWORKS 2020 opens extremely large drawings at lightning speeds. Engineers can make swift changes with drawings containing thousands of entities with no lag, bog down, or waiting.

Two new apps enable industrial designers, digital sculptors, and engineers to create complex geometry and organic shapes quickly and easily. 3D Sculptor is a web-browser based, 3D subdivision (sub-D) modeling solution for creating stylized, organic, and ergonomic models rapidly and effortlessly. 3D Creator is a web browser based 3D concept modeling solution that allows users to create concept models.

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SOLIDWORKS 2020 offers accurate modeling of assemblies with flexible components that can expand and contract. This new release also delivers powerful new ways to securely protect IP while still facilitating accurate collaboration with design stakeholders with envelope models.

Product development is changing rapidly. Engineer’s needs are changing, shifting, and evolving. There is an obligation for CAD applications to become faster, more accurate, and easier to use. SOLIDWORKS 2020 delivers a range of new tools to empower engineers.



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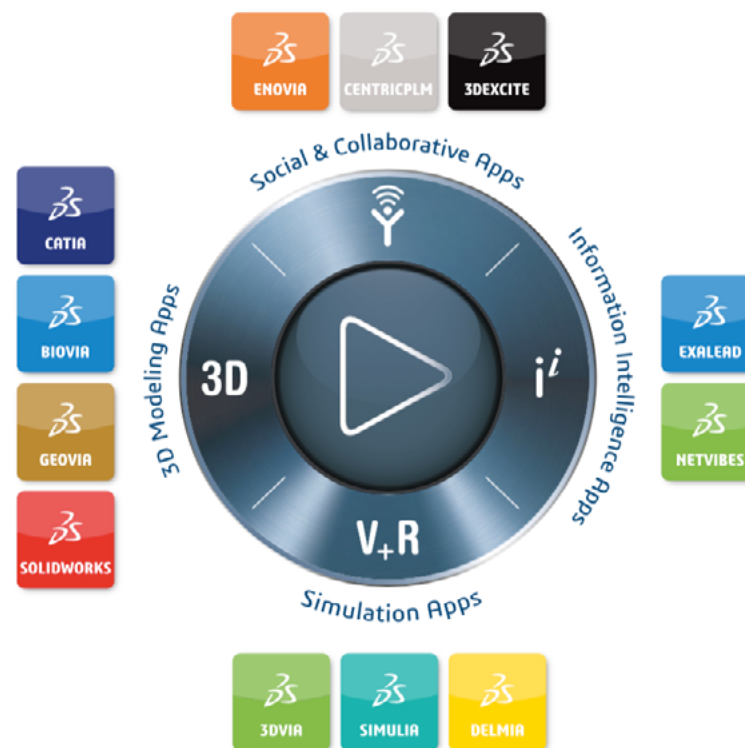
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## Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 250,000 customers of all sizes in all industries in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).



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