Deliver 3D engineering information to anyone, anywhere

Bring products to market quickly by extending design information across the extended engineering community

"By distributing 3D designs in Adobe PDF, we've accelerated review cycles by as much as 200%."

Doug Dominick
President, Atrus

The ability to easily exchange documents electronically rather than physically was viewed as a "must have" for 74% of respondents. Other "must have" abilities were saving and organizing multiple documents into one (36%), enabling document security (34%), reviewing and commenting of documents (26%), and viewing/navigating 3D CAD software without purchasing CAD software.

Source: Harris Interactive, 2007

Today's manufacturing organizations must persistently push the limits of new product development—driving innovation, minimizing design cycles, reducing costs, and improving quality and services—while bringing products to market faster than ever. Achieving these goals requires that organizations find better ways to enhance communication and collaboration across dispersed project teams and with remote suppliers, offshore production facilities, and customers worldwide.

In a recent study, Harris Interactive, a leader in global market research, surveyed engineers and managers in manufacturing on behalf of Adobe about their everyday communication and collaboration challenges. Among design respondents, 71% felt that collaboration reduced design errors or flaws, while 69% believed that it increased quality, and 63% said it increased productivity. While respondents clearly understood the many benefits of extending design information outside of engineering and sharing more product data with technical and nontechnical stakeholders earlier in the development process, they were not all realizing these benefits.

Among the key challenges to collaboration uncovered in the Harris survey were:

- Not everyone had the appropriate software to make changes/comments on the review documents. Furthermore, IT managers were compelled to limit their reliance on specialized CAD viewers on employee desktops for security, support, and implementation reasons.
- Sharing CAD data and other documents was difficult due to large file sizes.
- In some cases, reviewers were resorting to manually marking up and exchanging a paper copy of the document since not everyone had access to the tools necessary to view different types of CAD and other formats.
- Approximately half the respondents expressed concern about information control. Some wanted to restrict the ability to mark up documents, while others wanted to restrict printing and saving documents or to require the use of digital signatures.

Solve collaboration challenges with an industry standard you can trust

Portable Document Format (PDF) is a highly reliable, open standard electronic format that enables the universal exchange of documents. It accurately represents documents independent of application, hardware, and operating system. This means that a PDF file looks exactly like the original document, preserving text, layout, forms, drawings, 3D CAD, and even business logic, regardless of the application used to create it or the environment in which it's viewed. Furthermore, the entire PDF specification is now a formal open standard—ISO 32000. Maintained by the International Organization for Standardization, ISO 32000 will continue to be developed as an open format, protecting the integrity and longevity of PDF.

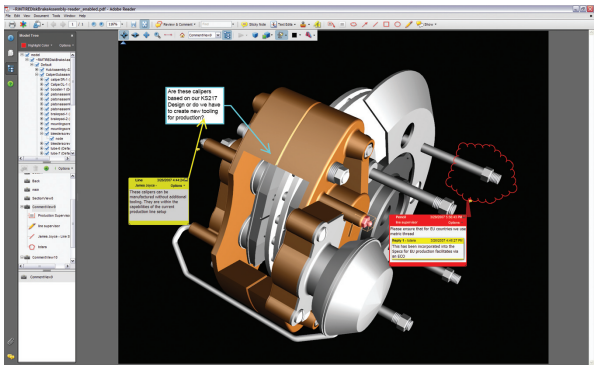
Adobe

"Before we used Acrobat, we had a lot of information that could not be distributed outside our engineering department. Now, Acrobat enables us to reliably deliver 2D and 3D CAD models and other project information to teams anywhere in seconds."

John Clauson
CAD and drafting manager,
The INDAK Group

Adobe® PDF eliminates the need to support multiple visualization file formats; it can be used in strict accordance with industry standards, such as PDF/A (ISO 19005) for long-term retention and archiving, and PDF/E (ISO 24517) for the reliable exchange of engineering information (including support for embedded 3D). In addition, PDF supports Universal 3D (U3D), an open and extensible file format for sharing and viewing interactive 3D designs.

PDF enables visualization, more secure collaboration, CAD data exchange, and data publishing across the entire product lifecycle. The ubiquitous PDF format directly supports 3D model-based definition, providing the flexibility to retain either precise 3D CAD geometry or a lightweight representation of 3D CAD designs. And unlike most other formats, PDF can also be used to combine 2D and 3D CAD data with other critical project content, such as interactive forms, bills of materials, and general office documents, into a single PDF file. Product Manufacturing Information such as Geometric Dimensioning and Tolerancing, text, and annotations can also be shared in PDF—all in a universal and highly compact file—which means manufacturers can rely on PDF to deliver any kind of information to the widest possible audience, both inside and outside the enterprise.



Did you know that Adobe Reader is installed on 89% of all Internet-connected desktops? Download the latest version for free at *www.adobe.com*.

Communicate and collaborate more effectively with everyone

Use PDF files to share product data with anyone who uses free Adobe Reader® software. Users of Adobe Reader 9 can more securely view and interact with product data and documents, reducing the need for separate CAD applications or viewers. They can interact with designs in three dimensions: rotating, zooming, measuring, and cross-sectioning for greater understanding and streamlined productivity. Your team can also work collaboratively in Reader—marking up 3D designs, saving 3D views, and adding comments.

"By integrating 3D models in PDF into our maintenance manuals, we give customer service engineers instant insight into system components and how they function."

Sherman Ferguson
Technical writer, Eaton Corporation

Maximize the value of product data assets

Save money by eliminating the need to buy expensive CAD translators. Adobe software enables the import of virtually any CAD file into PDF for rapid export to neutral formats such as STEP, IGES, or STL for use in downstream manufacturing processes, including tool design, CNC machining, rapid prototyping, and analysis. Technical writers and other creative professionals can repurpose design data to communicate complex ideas more effectively by introducing visually rich, interactive, and 3D content into technical documentation. Overcome language barriers by creating animations such as assembly and disassembly instructions to clarify how your product works.

Better access to product data means better communication and collaboration. Broader engagement means even downstream users working in tooling, support, maintenance, supply chain, procurement, tech pubs—or sales and marketing—can become more engaged in global manufacturing processes sooner, helping to maximize the return on investment (ROI) of 3D design assets.

Supported formats

LiveCycle PDF Generator 3D ES and Acrobat 9 Pro Extended create PDF files from a wide range of CAD and other file formats. For a comprehensive list of specific versions or formats supported, visit *www.adobe.com/go/pdf_generator_supported_formats*.

"By using best-in-class solutions such as Adobe LiveCycle PDF Generator 3D ES and LiveCycle Rights Management ES, we will be able to ensure our customers worldwide can share and review accurate design information anytime, anyplace."

Steve Roth

Chief marketing officer, MFG.com

Support user-driven and automated processes

Adobe offers both a desktop and a server-based product that can help address the varied needs of manufacturing organizations. Manufacturers have the flexibility to deploy these products individually or in combination to meet their solution requirements. This enables improved communication and faster decision-making, which leads to reduced design errors, increased quality and productivity.

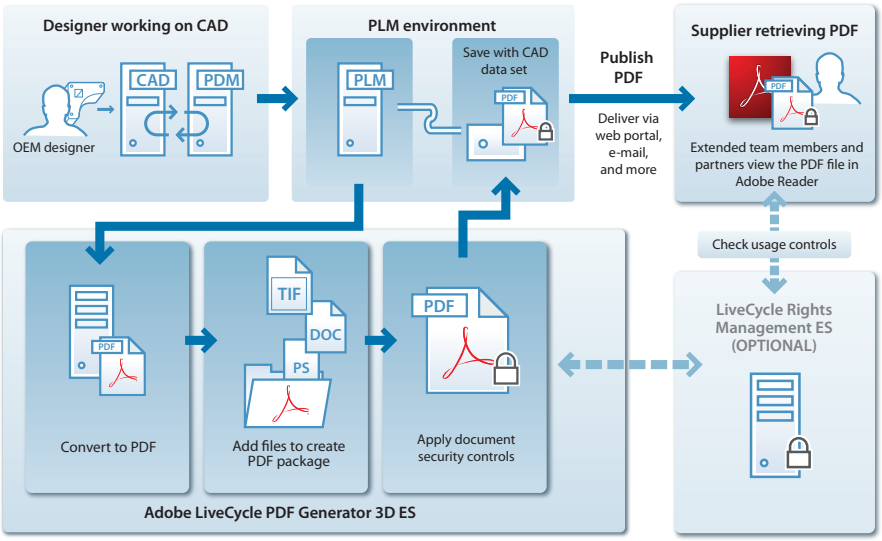
Create and share high-fidelity PDF files from the desktop

Use Adobe Acrobat® 9 Pro Extended software to easily organize and deliver engineering content from a variety of sources—including 3D designs, 2D drawings, spreadsheets, and office documents—into a single, searchable, compact PDF portfolio for easy distribution. Acrobat can be used by a single user or deployed enterprise wide to accelerate both ad hoc (impromptu) and structured visualization and collaboration workflows, promoting the free flow of ideas and adherence to standards and requirements.

Users can also take advantage of the new Adobe 3D Reviewer application (included with Acrobat 9 Pro Extended) to merge heterogeneous CAD formats into one assembly; measure and section on precise geometry; compare a revised design to an earlier version; and create exploded views, animations, and balloons. 3D Reviewer can also export files to a variety of neutral formats and 2D vector/raster formats or saved as a PDF file.

Automate the generation of 3D PDF files

Adobe LiveCycle® PDF Generator 3D ES software is a server-based enterprise application that enables the automated generation and assembly of 3D PDF documents and is part of Adobe LiveCycle ES (Enterprise Suite). LiveCycle ES software is an integrated server solution that blends data capture, information assurance, document output, process management, and content services. LiveCycle PDF Generator 3D ES can be used to build solutions in which sharing CAD designs can enhance communication and collaboration such as RFP/RFQ processes, work instructions, engineering change orders (ECOs), technical publications, and virtually any other 2D and 3D documentation process. By leveraging the PDF format for 3D and 2D designs as well as supporting office document formats, manufacturers can more securely extend their product information beyond the boundaries of their PLM and CAD systems. As a superset of Adobe LiveCycle PDF Generator ES software, LiveCycle PDF Generator 3D ES provides flexible APIs and interfaces for the conversion and assembly of both office document formats and 2D/3D CAD formats.



Integrate with your PLM system

Adobe LiveCycle components can significantly extend the value of a PLM system. PLM integration can allow 3D PDF file generation to be triggered by PLM system events and workflow processes as well as provide methods for exchanging other data and metadata for use in document assembly and generation workflows in LiveCycle ES.

Protect and control sensitive information

Retain control of your native CAD files and protect sensitive information by sharing your designs and engineering data as PDF files. Use Acrobat 9 Pro Extended to protect your proprietary information by applying passwords to restrict access to documents. Assign permissions to help control who can view, print, copy, and modify your files. You can also use PDF digital signatures to certify document authenticity, indicate approvals and sign-offs, and help prevent unauthorized changes. 3D PDF files can help manufacturers reach the right audiences with the right information while safeguarding sensitive information.

To further protect your data, Adobe LiveCycle Rights Management ES software can encrypt and protect documents inside and outside the firewall with persistent and dynamic permissions and policies that help maintain their confidentiality, control their use, and manage access control. Dynamic policies can allow online and offline control of information even after the document is released. Content can be set to expire at a predetermined date, actively supporting version control requirements that help ensure everyone is working with the correct document. Individual user or group access privileges can even be revoked in real time as necessary. This flexibility allows manufacturing organizations to confidently extend access to information needed for external processes like RFQ and supply chain collaboration.

Solve complex challenges with practical solutions

People, processes, and information are no longer islands unto themselves: Adobe solutions can help you better leverage and extend information for your back-end systems such as ERP, ECM, and PLM. Whether collaborating on product design, communicating up and down the supply chain, managing the engineering change order process, or better enabling a field service technician, practical solutions from Adobe can help accelerate, extend, and automate paper-based processes. You can also engage with customers, suppliers, partners, and employees faster and more simply while protecting your design and other product information.

This Design Exchange and Collaboration Study was conducted online within the United States by Harris Interactive on behalf of Adobe Systems in June, 2007, among 197 Design Engineers/Product Designers and 210 Production/Project Managers. Qualified respondents were U.S. residents, age 18+, and worked in the manufacturing industry with professions of CAD Manager, CAD User/Designer, Construction Manager/Supervisor, Engineer, Engineering Consultant, Engineering Management, Industrial Designer, Product Manager, Production Manager, or Program/Project Manager. No estimates of theoretical sampling error can be calculated; a full methodology is available.

For more information

For more details about products and solutions best suited for manufacturing organizations, visit *www.adobe.com/manufacturing*.

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