

# Autodesk DWF Versus Adobe PDF: What You Need to Know

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Autodesk® DWF™ technology and Adobe® PDF have some commonalities. Both are built around self-contained files that support multiple pages, printing, and password protection. Both offer a free product for viewing and printing files, and a for-pay version for reviewing and marking up files. However, Adobe PDF falls short compared to Autodesk DWF technology in several key areas that are important to Autodesk customers.

PDF was designed for simple textual- and graphical-based document exchange. DWF technology, on the other hand, was designed explicitly for sharing rich design data. The Autodesk® DWF™ Viewer and Autodesk® DWF™ Composer products additionally offer the tools our customers need to accelerate their review processes and communicate feedback quickly—and accurately.

Learn more about the whole truth when it comes to your customers' platform for collaboration, and the software solutions offered by Autodesk and Adobe, in this 11-point article.

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## 1. Support for 3D Models

Despite the release of Adobe® Acrobat® 3D on January 23, 2006, which enables users to publish 3D designs, the Adobe offering falls short versus Autodesk's. Table 1, below summarizes the key differences between Adobe and Autodesk's support for 3D publishing and design review.

**Table 1:** Comparison of support for 3D published files.

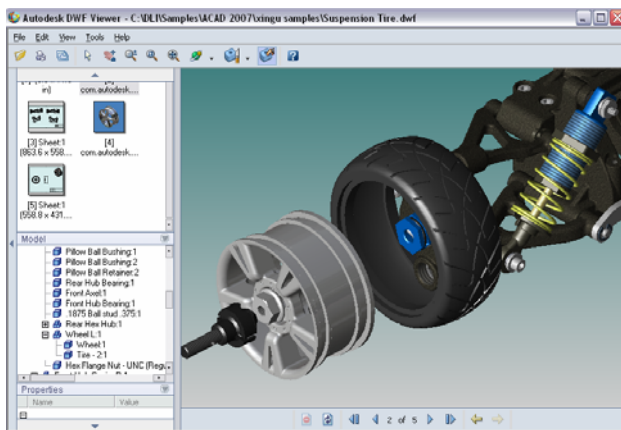
	<b>Autodesk 3D DWF</b>	<b>Adobe 3D PDF</b>
Applications that natively publish 3D files	<ul style="list-style-type: none"> <li>▪ AutoCAD®</li> <li>▪ AutoCAD® Electrical</li> <li>▪ Autodesk® 3ds Max®</li> <li>▪ Autodesk® Architectural Desktop</li> <li>▪ Autodesk® AutoCAD® Revit® Series</li> <li>▪ Autodesk® Building Systems</li> <li>▪ Autodesk® Civil 3D®</li> <li>▪ Autodesk® DWF™ Composer</li> <li>▪ Autodesk Inventor®</li> <li>▪ Autodesk® Land Desktop</li> <li>▪ Autodesk Map® 3D</li> <li>▪ Autodesk® Productstream™</li> <li>▪ Autodesk® Revit® Building</li> <li>▪ Autodesk® Revit® Structure</li> <li>▪ DWG TrueView™</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bentley® MicroStation®</li> </ul>
Tools to publish 3D files	The free Autodesk® DWF™ Writer supports publishing to 3D from any Microsoft® Windows®-based application. Plug-ins for Solidworks® and Pro/ENGINEER® software enable publishing of 3D data, including design data.	Customer must purchase Adobe Acrobat 3D (\$995) to convert CAD files to 3D. To add rich design data, a user must use the 3D Toolkit and programmatically add rich 3D content like exploded views.  (Note: Similar capabilities are available by purchasing Right Hemisphere® software and using it with Adobe Acrobat Professional 7.0).
Tools to review and mark up 3D files	Autodesk DWF Composer 2 supports 3D measure and markup. You can also round-trip to all AutoCAD-based products (Architectural Desktop, Civil 3D, Map 3D) along with Revit Structure 8 and Revit Building files, through an integrated review with DWF Composer users.	Adobe Acrobat Professional 7.0 does not support 3D markup. Users can markup documents that contain 3D files embedded in Microsoft® Word, Excel, or PowerPoint.
Costs	<ul style="list-style-type: none"> <li>▪ Free to publish (DWF Writer)</li> <li>▪ Free to view &amp; print (DWF Viewer)</li> <li>▪ \$199 to review and markup (DWF Composer)</li> </ul>	<ul style="list-style-type: none"> <li>▪ \$995 to publish (Adobe Acrobat 3D)</li> <li>▪ Free to view &amp; print (Acrobat Reader)</li> <li>▪ \$449 to review and markup (Adobe Acrobat Professional)</li> </ul>

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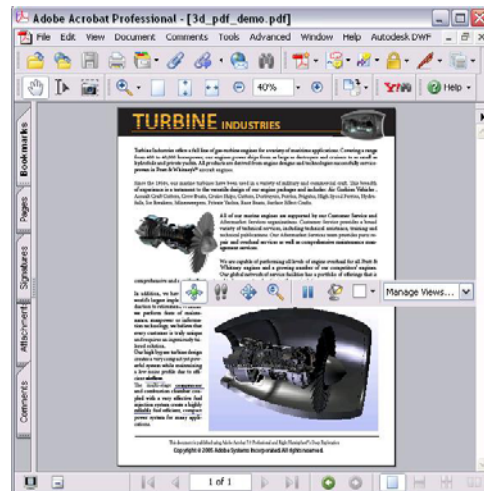
## AUTODESK DWF VERSUS ADOBE PDF: WHAT YOU NEED TO KNOW

Another issue when comparing 3D solutions is the development approach. Autodesk first introduced 3D DWF technology in 2004 and has continued to enhance the 3D DWF capabilities as our design applications capabilities have grown. As a result, our customers can expand their 3D collaboration as they design more and more with 3D. Adobe, on the other hand, is currently building 3D capabilities around U3D technology – a technology not developed to meet existing customer needs. An example of this is that fact that Adobe's demonstration for sharing 3D designs is a paper one: U3D files are published then inserted into Microsoft® Word for review. To share 3D data, like exploded views, or object data customers must programmatically use the PDF developer toolkit to add this data. With DWF, customers can publish this data directly out of their Autodesk application or use the DWF Writer plug-ins for Solidworks® and Pro/Engineer®.

**Figure 1:** 3D viewing tools for Autodesk DWF Viewer show our CAD-centric approach versus Adobe's document-centric approach.



3D DWF file in Autodesk DWF Viewer 6.5



3D PDF file in Adobe Acrobat Professional 7.0

## 2. Manufacturing and AEC workflows

While Adobe may be targeting our customers, one thing we've heard from those customers familiar with both solutions is that what works for financial institutions and graphic arts professionals does not support the needs of engineering and architectural workflows. Our customers have complex workflows and require knowledge experts to help solve their most challenging problems. Their complex data includes 2D and 3D designs, computer-aided design (CAD) standards, text files, spreadsheets, timelines, images, and sketches, as well as various custom-built solutions for managing data in the design process. Their workflow involves people in the office and in the field. Some have significant technology experience and others have very little.

Even for homebuilders who are building a community of similar-looking homes, no single project or interaction is exactly the same. Autodesk customers need a flexible solution that is purpose-built for their business—one like Autodesk DWF technology and the Autodesk DWF Composer application. Solutions like Adobe PDF—a direct descendant of the PostScript® page-description language—were built for print-publishing workflows and just don't meet the needs of Autodesk customers. By standardizing on the Autodesk DWF format, customers such as L. Robert Kimball & Associates have been able to:

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- Minimize file transmission time and reduced archive size because they found published DWF files to be more compact than PDF files
- Complete design reviews faster and more cost-effectively by eliminating the need to send sets of redline markups through overnight mail
- Cost-effectively share design data and CAD documents with staff, consultants, and clients
- Generate 3D DWF files of project layouts.

Customers like L. Robert Kimball & Associates are using Autodesk DWF Composer software with Autodesk design software for design review purposes. They're benefiting from the ability to round-trip their markups back to the CAD users for quick revisions. Reviewing markups in the context of the design is much more efficient than tracking down changes marked on a piece of paper. All AutoCAD- and Revit-based products support this capability with the Markup Set Manager feature. In the future, Autodesk plans to release additional DWF-based products that continue to solve our customers' workflow problems.

*"We've migrated away from providing PDF files and are encouraging clients and contractors to use DWF format because there are so many benefits. It's a much more flexible and useful format."*

—Dean Helsel  
Senior Technical Leader  
L. Robert Kimball & Associates

### 3. Collaboration and Data Management

Though Adobe sells collaboration solutions to our customers, Autodesk offers practical data management and collaboration solutions that enable our customers to get up and running in a single day. Autodesk solutions are purpose-built to support 2D and 3D collaboration with internal and external teams. Solutions like Autodesk Streamline, Autodesk Vault, Autodesk Productstream, and Autodesk Buzzsaw collaborative software and services have forms and connections into our customers' suppliers, contractors, and other critical vendor relationships.

Adobe LiveCycle™ software, on the other hand, was built for form collaboration in the financial services community, not for manufacturing, building, or infrastructure workflows. The software does not provide the file management capabilities our customers demand. In fact, customers must republish and update files when the source file is updated. Adobe customers must invest significant amounts of money with systems integrators to make PDF systems work for their business. Autodesk's collaboration and data management solutions all support DWF natively and are custom built for our customer targets.

### 4. Data Complexity

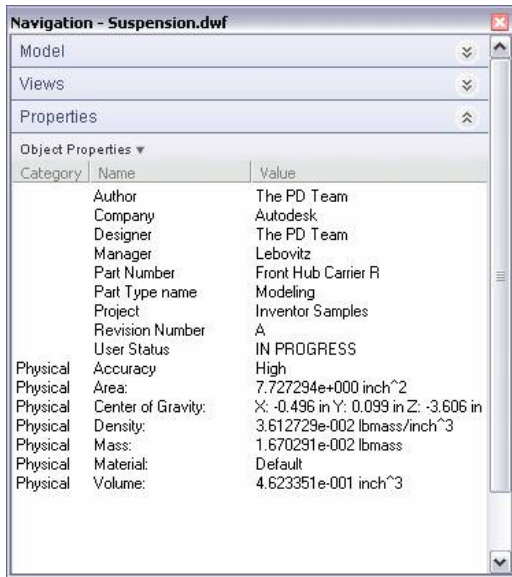
Sharing rich design data is essential to communicating the true intent of the design. While Adobe has been adding some data to their PDF files, their solution requires significant programming efforts to add this data. When publishing a PDF file that includes metadata in Adobe Acrobat Professional, users must manually add the XML data with programmatic scripts. DWF, on the other hand, recognizes the metadata in CAD files and models with no extra scripting. Users simply select the data they want to include in the published DWF file.

DWF files can include rich information from the original CAD model, assorted views, hyperlinks, sheet details, and XML-based object properties. Our customers can publish and share even more data: manufacturing customers can access component and mass properties such as part numbers, manufacturer, density, mass, and volume. Building

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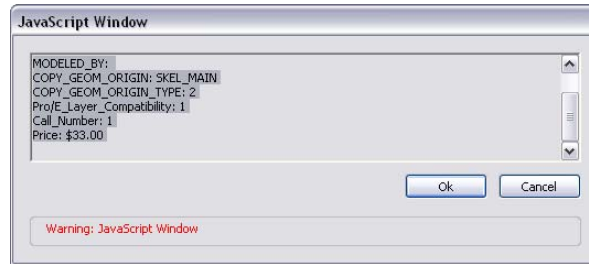
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customers can access object properties such as dimensions, materials, and fire ratings. And Infrastructure customers can scale with powerful precision, see parcel IDs, or jump through a mapbook with hyperlinks.



Autodesk DWF Viewer

**Figure 3:** Properties window from Autodesk DWF Viewer for a manufacturing DWF file is displayed in a user-friendly way versus the JavaScript dialog box presented with Acrobat Reader.



Adobe Acrobat Reader

## 5. Accuracy and Integrity

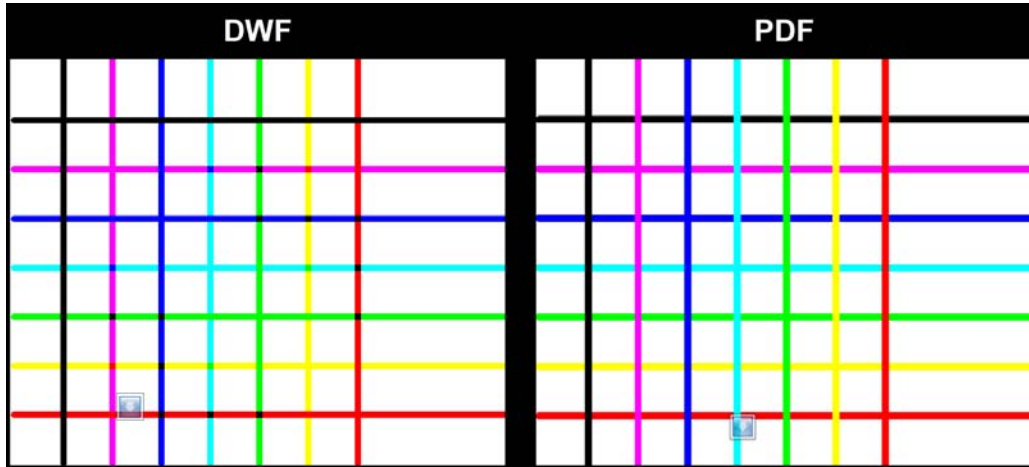
Adobe claims that “PDF files look exactly like original documents and preserve source file information—text, drawings, 3D, full-color graphics, photos, and even business logic—regardless of the application used to create them.” The whole truth, however, is that PDF files fall short when it comes to the accuracy our customers require. Clear differences include the fact that DWF files can be published at resolutions as high as 60,000,000 dpi (dots per inch), enabling significant scaling from an aerial photo to a specific parcel, for example. Adobe offers 4,000 dpi. What’s more, in Adobe Acrobat Professional customers cannot snap to the geometry of the design or take a measurement without having to calibrate the scale. In Adobe Acrobat, the page standard orientation is an 8 ½ x 11 page orientation and customers must rotate the document 90 degrees at publish time to “get it right.” Autodesk software, on the other hand, enables users to:

- Snap to geometry in Autodesk DWF Composer
- View real-world coordinates with an x, y, and z axis
- Publish different scales per viewport, so the user can accurately measure drawings in Autodesk DWF Composer
- Correctly support merge control, so overlapping lines are defined, not merged (see Figure 2)

Even when it comes to printing, the Adobe Acrobat solutions fall short. Although the printout may be an accurate representation of the PDF file being viewed, the original PDF file needs to be accurately published to print accurately.

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**Figure 2:** The below graphics demonstrate the differences between how Autodesk DWF and Adobe PDF handle merge control. Notice how the PDF file layers the vertical lines on top of the horizontal lines while DWF handles both horizontal and vertical lines as layers.



## 6. Compact File Size

Emailing still remains a part of our customers every day workflows and the ability to package up their designs in a single file they can email is essential to collaboration. Our customers who email large sheet sets must often break them into multiple PDF files to communicate the full set of information, a time-consuming and tedious process. PDF files are often as much as 10 times larger than DWF files, straining bandwidth and system resources, and slowing publishing and viewing times.

Since DWF was purpose-built for Autodesk customers, with publishing capabilities built right into Autodesk design software, DWF files are often smaller than PDF files and easy to email without reaching system limits. The following table compares representative file sizes for DWF and PDF formats, using files from the AutoCAD 2005 CD\*.

**Table 2:** File size comparison

File Size (KB)	Autodesk 3D DWF	Adobe 3D PDF
Architectural Sheet Set (7,273)	890	4,506
Manufacturing Sheet Set (10,774)	645	4,026
Civil Sheet Set (14,327)	4,312	15,932
Stadium Plan.dwg (4,917)	759	2,755
Hotel Model.dwg (2,177)	753	Error (unable to publish)

\*As with all performance tests, results may vary based on machine, operating system, filters, and even source material. While every effort has been made to make the tests as fair and objective as possible, your results may differ.

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## 7. Control of Intellectual Property

Although Adobe offers features such as digital signatures and password protection for Adobe PDF documents created with Adobe Acrobat 7.0, Adobe Acrobat 3D, or Adobe LiveCycle software, Adobe misses the mark on our customers' primary needs: providing at least the same level of security and control of their intellectual property as that provided with paper.

DWF files help protect the intellectual property of the original design by including only what the designer intends to share. By default, the precision of a DWF file is similar to that of a paper plot. Authors can increase the resolution as appropriate for their audience. Layer information can be turned on or off. Object properties or attributes are not included unless published by the CAD user. Password protection and encryption provide further security for DWF files.

## 8. Installing a Viewer or Reader

You may have heard a benefit for sharing PDF files is that everyone has an Adobe Reader installed on their system – making reading a PDF easy. While many people have an Adobe Reader installed, it's important to note that many customers have older versions of Adobe Acrobat Reader and must upgrade the software to view 3D or CAD files. Installing Autodesk DWF Viewer from the Autodesk website is as easy as installing an update from Adobe. In fact, it is probably easier since DWF Viewer 6.5 is half the file size of Adobe Acrobat 7.0. Autodesk also offers a CAB installer to install the software behind the scenes—much like Flash is installed today—and provides the ability to deploy the software across an organization. Customers can download Autodesk DWF Viewer at [www.autodesk.com/dwfviewer-download](http://www.autodesk.com/dwfviewer-download) or install it right from their AutoCAD or other Autodesk software CD.

## 9. Open Standards

Though Adobe claims to be “compliant with industry standards including PDF/A, PDF/X, and PDF/E,” Adobe protects the many useful versions of PDF as a proprietary format. Adobe charges large royalty sums to allow third-party developers to build on PDF. Autodesk's approach, on the other hand, is to foster an open community by making our technology compliant with the Open Source Initiative. We have architected the DWF technology on existing open industry standards, such as XML, PGN, JPG, ZIP, and so forth. The Autodesk DWF Toolkit is available at no charge at [www.autodesk.com/dwf-developers](http://www.autodesk.com/dwf-developers), which means that developers are free to develop with DWF technology. The current release, Autodesk DWF Toolkit 7, includes support for 3D DWF. To date, more than 100 CAD developers have incorporated DWF into their platform, including Applied Spatial—a recent Building Solutions Division acquisition.

For some specific use cases Adobe has pursued International Standards Organization (ISO) standards to generate the perception that PDF is open. The PDF standard that was accepted by ISO includes the ability to use PDF for archiving (PDF/A) and for exchanging advertising content (PDF/X). These versions of PDF are antiquated by today's standards and do not meet the needs of our customers. Adobe's proposal for a format that supports the needs of engineers (PDF/E) is actually a restricted subset of the full PDF standard instead of additions that would specifically meet the needs of the engineering industry.

## 10. CAD specific viewing software

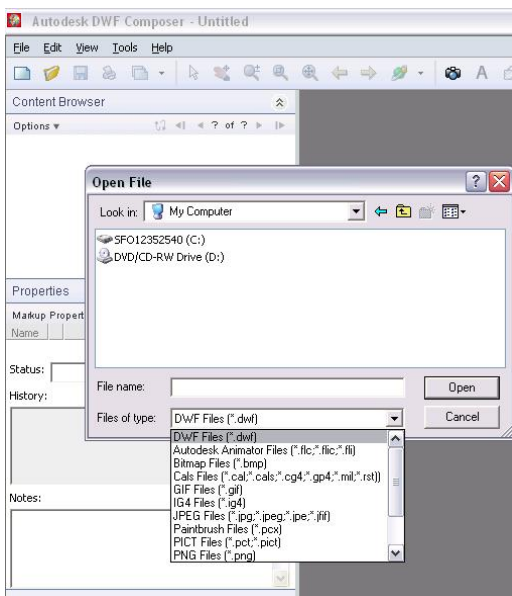
Adobe markets their PDF format as a “super container” for multiple formats for team collaboration. While it is true that a PDF can contain data published to PDF from multiple sources, collaboration with Adobe Acrobat Standard, Professional, and 3D require the user to have purchased or downloaded additional file viewing tools on their system.

Adobe PDF is the only native file format that users can open in Adobe Acrobat Professional 7. Viewing of other formats, such as DWG format, requires an application that supports it, such as AutoCAD or Adobe® Photoshop® software. Autodesk DWF Composer 2, on the other hand, supports the needed viewing capabilities out of the box. In Autodesk DWF Composer 2, you can open not just DWF, but also the following file formats:

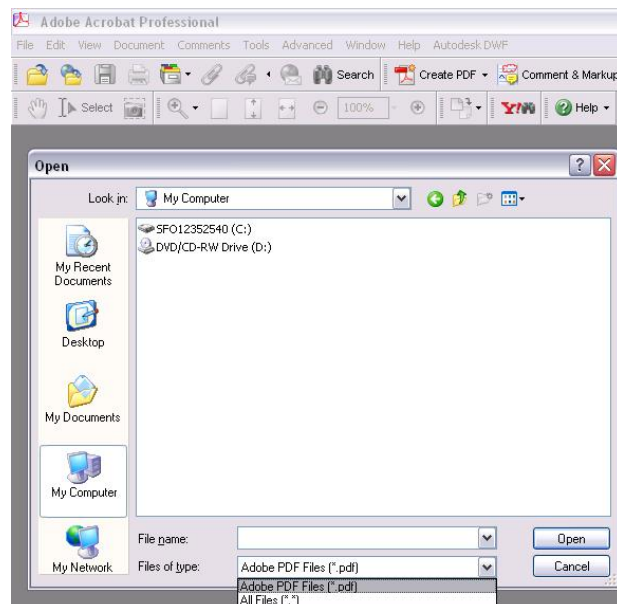
- Autodesk animator files (.flc, .flic, .fli)
- Bitmap files (.bmp)
- Cals files (.cal, .cals, .cg4, .gp4, .mil, .rst)
- GIF files (.gif)
- IG4 files (.ig4)
- JPEG files (.jpg, .jpeg, .jpe, .jfif)
- Paintbrush files (.pcx)
- PICT files (.pct, .pict)
- PNG files (.png)
- RLC files (.rlc)
- TARGA files (.tga)
- TIFF files (.tif, .tiff)

In addition, Autodesk DWF Composer supports DWG files with its DWG viewing component and Autodesk Inventor files with the Autodesk Inventor View application that ships with the Autodesk DWF Composer software.

**Figure 4:** Open File commands in Autodesk DWF Composer and Adobe Acrobat Professional, displaying available file formats.



Autodesk DWF Composer 2



Adobe Acrobat Professional 7



## 11. Partnerships

While Adobe points to relationships with UGS, HP, and Intel as third-party endorsement and reasons why our customers should use PDF, the whole truth is that Autodesk has these relationships, among others. Autodesk, the company, has 4 global strategic partners—Microsoft, Intel, Hewlett-Packard, and IBM. Additionally the DWF team has forged specific relationships around design collaboration:

- Autodesk has been working with HP as well as several other prominent printing vendors—for example, industry-leaders Océ, KIP, PLP, Xerox, Epson, Ricoh—to optimize the quality and performance of DWF printing output. With the release of Autodesk DWF Viewer 6 and Autodesk DWF Composer 2, we brought to market with HP the first software implementation of “HP Instant Print.” This feature enables customers with supported HP® Designjet® printers to instantly print their files to their local printer. (See joint press release from May 25, 2005, “[Autodesk Launches Instant Printing with HP for Efficient Teamwork in Building, Manufacturing and Civil Infrastructure Sectors.](#)”)
- Long before Adobe built a relationship with UGS, Autodesk had already announced a similar relationship with UGS to improve collaboration with manufacturing customers. Autodesk, like Adobe, is a member of the JTOpen alliance through our respective partnerships.
- A notable Autodesk partner that was announced in December 2005 is Microsoft. Though Autodesk’s relationship with the Redmond company is in development, we’re aligned on our commitment to helping our customers solve their challenging workflow problems. (See joint press release from December 13, 2005, “[Microsoft and Autodesk Broaden Strategic Alliance to Enhance Productivity in Manufacturing, Engineering and Construction Industries](#)” and view the video with SOM at [www.autodesk.com/microsoftvideo](http://www.autodesk.com/microsoftvideo).)

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