

Acrobat Insider for Manufacturing Professionals

Tips and Tricks for Adobe® Acrobat® 3D

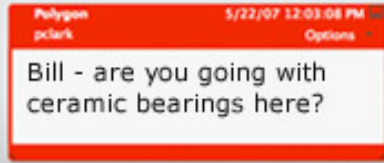
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WORK BETTER IN 3D.

What's New in Acrobat 3D Version 8

Improved 3D Collaboration for Engineers

by Robert Green

In the next few issues of *Acrobat Insider for Manufacturing*, I'll be showing you around the new Adobe® Acrobat® 3D Version 8 release. As we go along, I'll not only point out what's new but also explain how the new features could be useful to you.

I like to refer to Acrobat 3D as a "CAD Swiss Army Knife" because of the variety of CAD file formats that it supports, the visualization capabilities that it brings to the table and, of course, its ability to blend CAD data into PDF files with other types of data in the engineering enterprise. I think you'll find that Version 8 has added a few more neat attachments to the knife.

A Familiar (Inter)Face

The first time you fire up Acrobat 3D Version 8, you'll see the familiar interface of the previous version. If you've never explored Acrobat 3D but have some familiarity with 3D CAD packages, you should feel at home quickly as a part/assembly feature tree and viewing window comprise almost the entire screen. Along the top of the window are pull-down menus and toolbars that combine familiar Acrobat features with Acrobat 3D-specific functions. After a little exploration, you'll be ready to get to work with Acrobat 3D Version 8 software.

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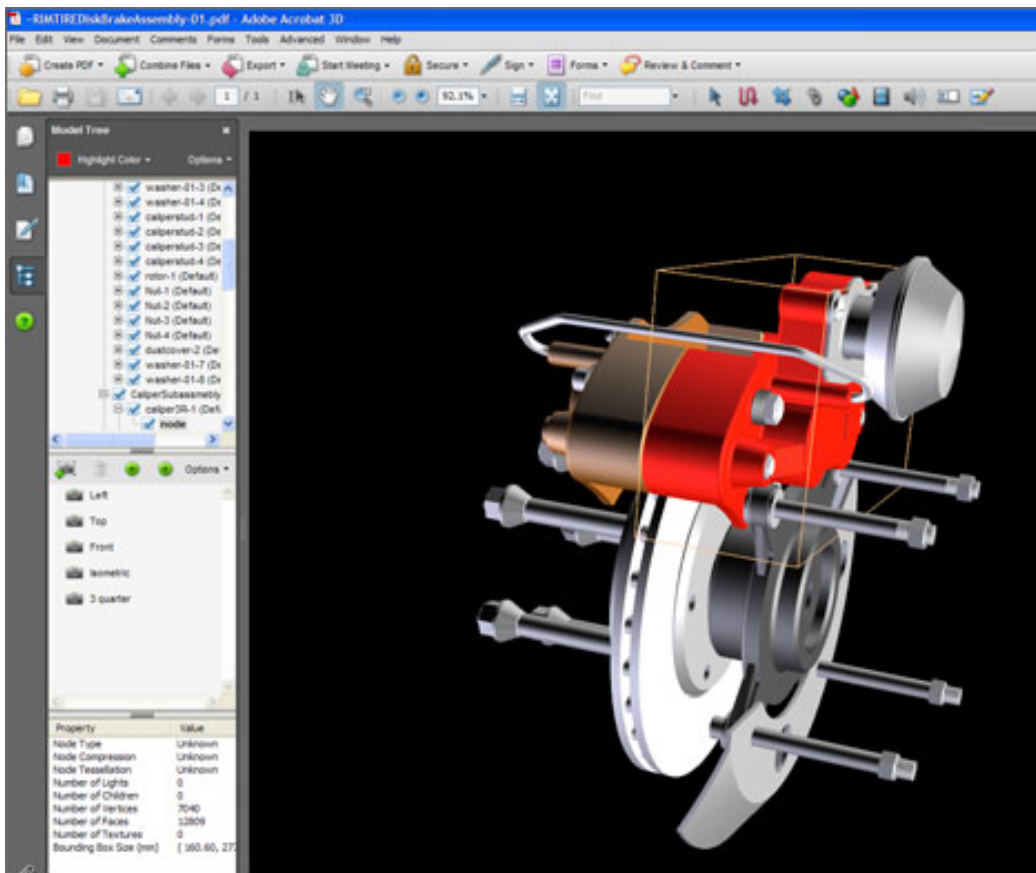


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IN THIS ISSUE

The new features in Acrobat 3D Version 8 mean smaller files and enhanced collaboration.



With just a little exploration, 3D CAD users should feel at home with the Acrobat 3D Version 8 interface.

Enhanced 3D File Collaboration

Acrobat 3D has always been able to import an assortment of 3D CAD part and assembly structures and to enable the visualization of that data. In fact, the ability to manipulate a variety of data formats and then produce visualization and collaborative data from these disparate CAD formats is precisely why I call Acrobat 3D a CAD Swiss Army Knife in the first place. Yet with all these collaborative capabilities, two problems remained (until now): information degradation and the inability to convey all the CAD data in a compact data format. Acrobat 3D Version 8 breaks new ground in both these areas thanks to the PRC file format.

The genesis of the PRC file format occurred when Adobe acquired TTF (Trade and Technology France), a firm that specialized in creating file translation and interoperability tools for 3D CAD programs. By acquiring TTF's expertise and incorporating the technology into Acrobat 3D Version 8, Adobe gives users the ability to import CAD and annotation information (more on that in the section on PMI below) and store it in a highly accurate and compressed state with no extra effort on their part.

Now when you import 3D geometry into Acrobat 3D Version 8, that data can be saved to a PRC file format to achieve the following benefits:

- Complete 3D translation, including annotative elements (PMI is not

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available for all formats)

- High file compression (sometimes exceeding 150 to 1 ratios)
- PRC B-rep offers precise and topographically accurate data
- The ability to export the converted data in a neutral format (STEP, IGES, Parasolid) so you don't have to send your native CAD data to anyone

In a very real sense, Acrobat 3D Version 8 has become a file translation and compression tool that is optimized for 3D CAD collaboration. If you can envision importing a complete assembly of parts into a single file and achieving 150 to 1 compression (like crunching a 500 MB suspension assembly down to a 3.5 MB email attachment), you'll begin to sense the power of what's available.

U3D and the new PRC file formats allow more secure collaboration using high precision data at very high rates of compression:

- **PRC B-rep (Solid)** — Includes the 3D model's geometry information. File size is smallest, but polygonal representation is generated each time the file is opened.
- **PRC B-rep + Tessellation** — Includes the 3D model's geometry information and polygon settings. If no polygon settings are present, Acrobat 3D Version 8 generates them on conversion to PDF. The resulting files are slightly larger, but open because the polygons have already been created.

The following are tessellation-only formats:

- **PRC Tessellation (Faceted)** — Retains or generates new polygon settings.
- **U3D ECMA 3** — Compatible with Acrobat 8 and Adobe Reader® 8 and produces file sizes up to three times smaller than the previous U3D implementation.
- **U3D ECMA 1** — Compatible with Acrobat 3D and Adobe Reader 7.07 or higher.

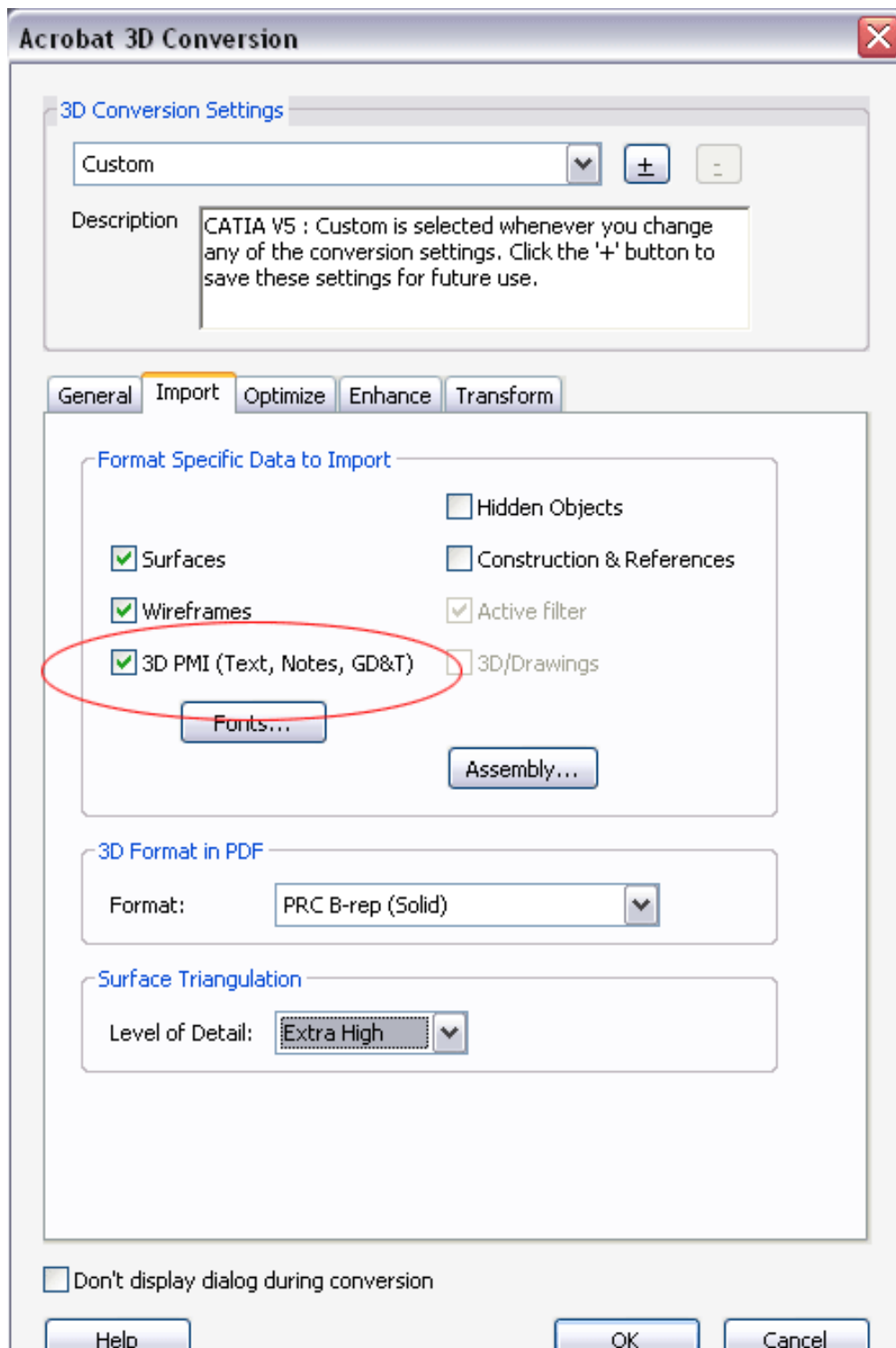
These data sharing scenarios mean that you should be able to find a way to share **only** the information you want to share while still achieving high levels of compression, thus making collaboration over low bandwidth connections practical.

Conveying PMI – Product Manufacturing Information

If you hang around the CAD world long enough, you'll learn to speak in acronyms. (After all, CAD itself is an acronym!) Acrobat 3D Version 8 introduces another acronym — PMI, which is short for "product manufacturing

information." For mechanical CAD users, PMI can be thought of as geometric tolerancing, dimensions, and text annotation features required to convey manufacturing tolerances to the shop floor. And since 3D CAD systems all have their own standards for conveying their version of PMI, there's never been a uniform way to convey this information via viewers or even prior releases of Acrobat 3D.

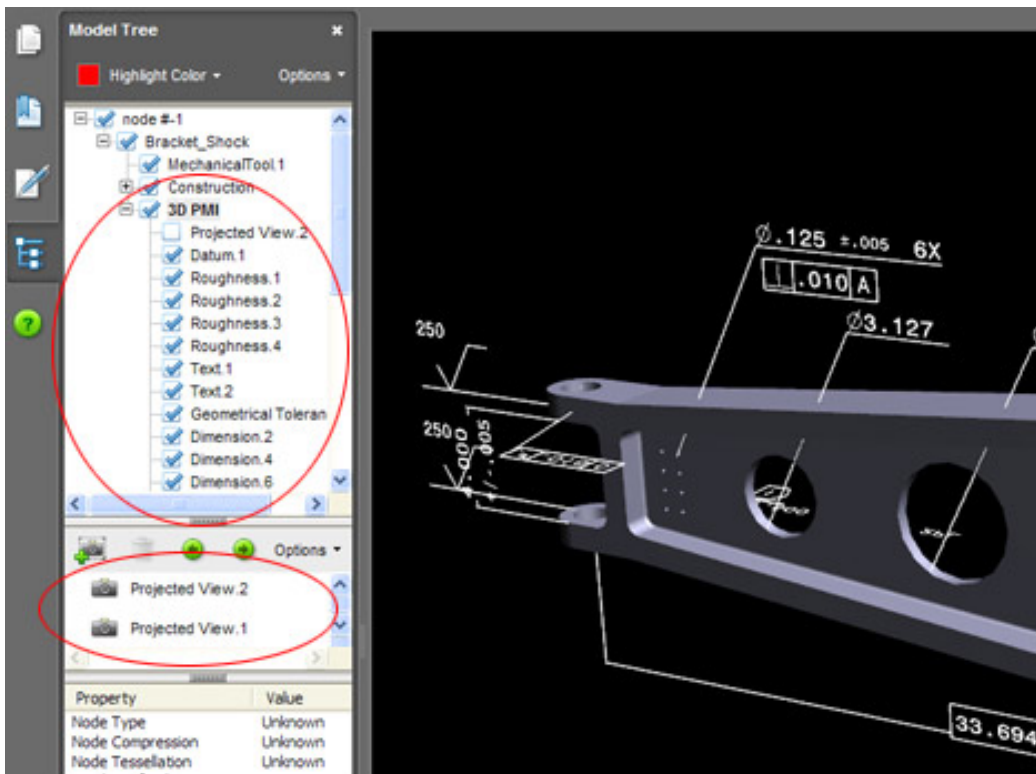
One of the new features made possible by Adobe's acquisition of TTF is the ability to read in PMI information from the 3D CAD geometry directly as the geometry is imported into Acrobat 3D. To capture the PMI information from an imported model in Acrobat 3D Version 8, you need to set the 3D PMI option on the Import tab to add the PMI objects, as shown below.





When importing 3D geometry, you can include PMI (product manufacturing information) entities to add manufacturing annotations as well as metadata.

Once the 3D geometry has been imported along with the accompanying PMI information, you'll be able to view the model plus the annotation as shown below. (And the same formats that allow you to read PMI can also show metadata.) In manufacturing environments where the tolerancing and control of the processes required to build parts is crucial, the PMI information may, in fact, be more important than the image!



Importing 3D geometry along with PMI data can allow precise control of annotative elements to assist manufacturing and shop floor inspection.

Cool tip: You can control the visibility of the various PMI data entities using the feature browser as shown to the left in the figure above.

Combining Files into a PDF Package

Even those of us who work with CAD a lot have to admit that there's more to documenting a design than just CAD, right? With spreadsheets, various

graphics, digital photographs, text documents, and a host of other possible data sources, it would be very helpful to be able to put all your data in a single repository file. (See [Insider #11](#) for tips on using Microsoft Office with Acrobat 3D.)

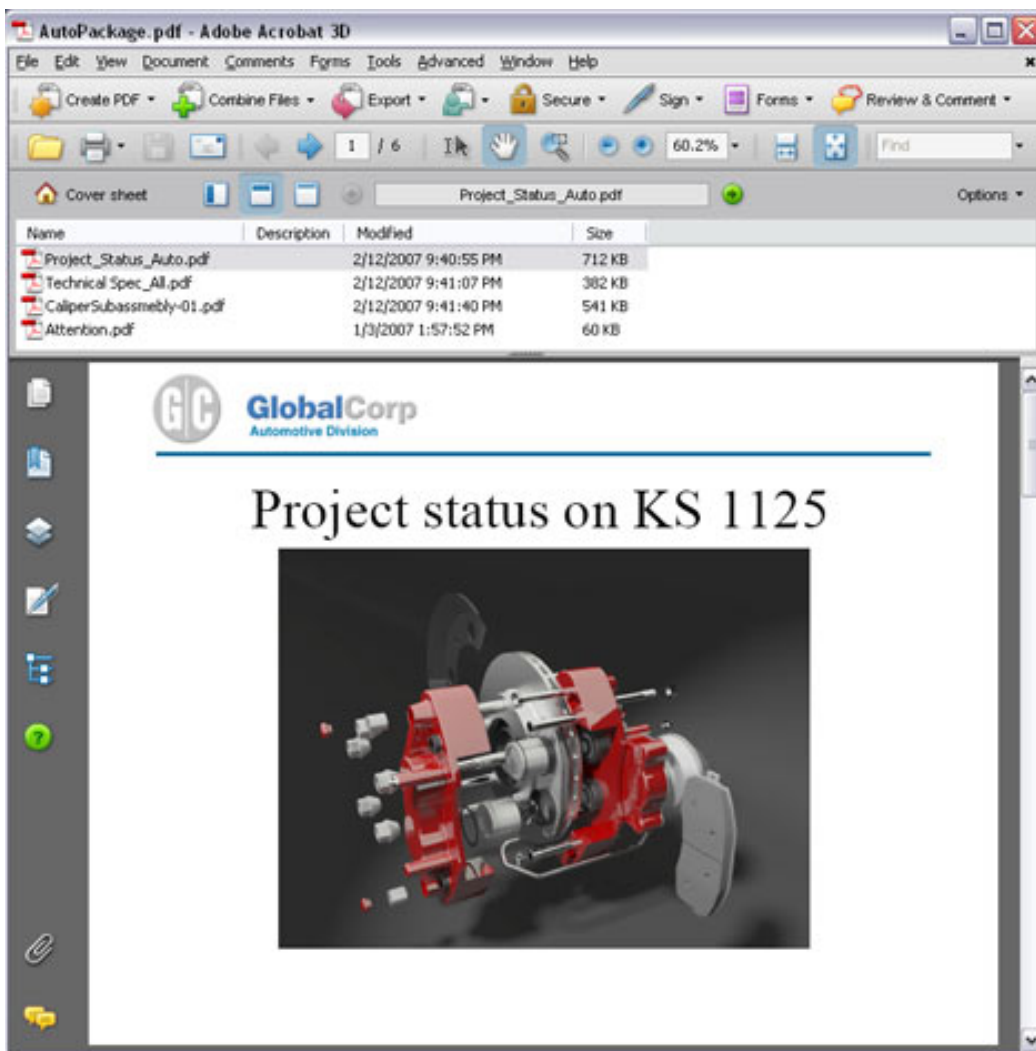
Acrobat 3D Version 8 can allow you to combine the improved 3D visualization and annotation tools we've already discussed with all the other data you need simply by saving to PDF format and combining everything into a single PDF Package.

A sample scenario might go like this:

1. In Microsoft Excel, open the worksheets you need and save them as a PDF file (using the Acrobat PDFMaker Toolbar, which is automatically added to your Microsoft Office applications).



2. In Microsoft Word, open the document you need and save it to another PDF file (again using the PDFMaker Toolbar).
3. Include manufacturer's data information for stock components from PDF files already supplied by the vendor.
4. Organize the above PDF files into a single folder (for convenience).
5. In Acrobat 3D Version 8, use the Combine Files Tool on the main toolbar to launch the new PDF Packager function, as shown below.



The PDF Packager makes creating a composite PDF file from various files easy.

6. Now use the Create PDF Tool to create a new PDF file.
7. Simply drag and drop the PDF files you created in the steps above into the PDF Package in the order you'd like them to appear.

That's all there is to making a single design documentation package in PDF format. Compared to the older interface, the Packager is a big leap forward in speed and ease of use. Just being able to visually "see" the order of the documents alone justifies the use of the new feature for me.

Cool tip: When you create a PDF Package, you can specify a PDF cover sheet, which can be any PDF file you create. This is especially useful for putting company logos or standard transmittal sheets as the very first page of a design package or proposal.

Summing Up — Try It Yourself!

Of course there's really nothing I can write that can substitute for the experience of actually running Acrobat 3D Version 8 software. To that end, why not download the software and give it a test drive yourself? Just visit www.adobe.com/products/acrobat3d/tryout.html and download the trial version to explore its capabilities. Use this issue of *Acrobat Insider* as a tour guide, and see some of the collaborative capabilities that Acrobat 3D Version 8 can offer.

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About the Author

Robert Green (rgreen@greenconsulting.com) performs CAD programming and consulting throughout the United States and Canada. He is a regular contributor to *Cadalyst* magazine. Robert lives in Atlanta, Georgia.

Details and Availability

For a full list of features and system requirements, visit the [Adobe Web site](#). Microsoft Windows® 2000 with Service Pack 2, Windows® XP Professional or Home Edition, or Windows XP Tablet PC Edition is required for use with Acrobat 3D. Acrobat 3D for Windows, available on CD-ROM or by download, is \$995.*

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