# ARCHIVING ENGINEERING DOCUMENTS USING PDF

January 29, 2018


# AGENDA

Terms and Definitions

PDF for Engineering

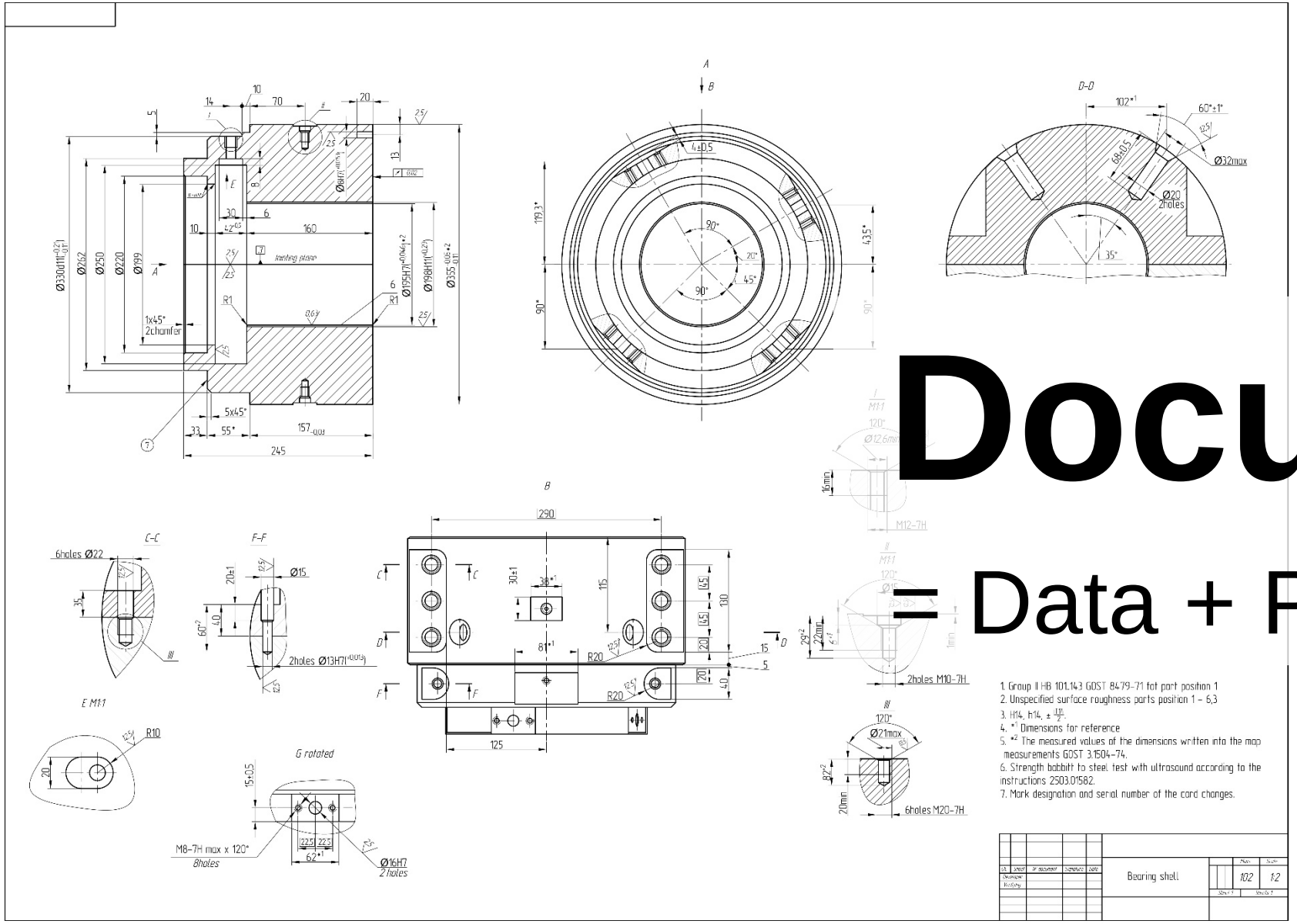
Archiving Technical Data Packages using 3D PDF

# TERMS AND DEFINITIONS

A 3D Engineering Perspective

# Data

= Information in numerical form that can be digitally transmitted or processed


Document
= Data + Presentation
Bearing shell
1. Group II HB 101.143 GOST 8479-71 for part position 1
2. Unspecified surface roughness parts position 1 – 6,3
3. H14, h14, ± IT/2
4. *1 Dimensions for reference
5. *2 The measured values of the dimensions written into the map measurements GOST 3.1504-74.
6. Strength babbitt to steel, test with ultrasound according to the instructions 2503.01582.
7. Mark designation and serial number of the card changes.

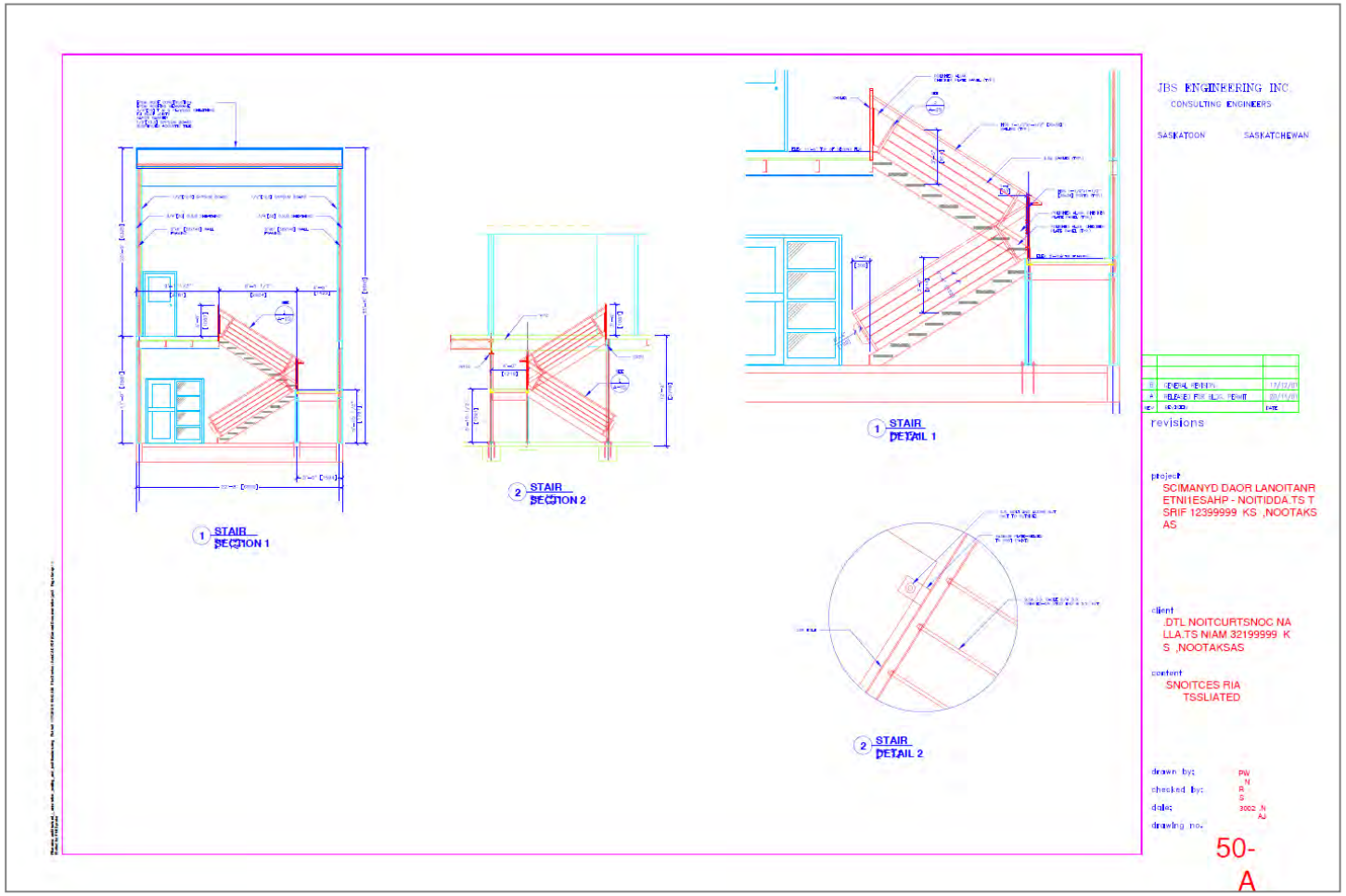
# Record


= Data + Documents + Security


= Data +
Documents +
Records +
Security +
Persistence

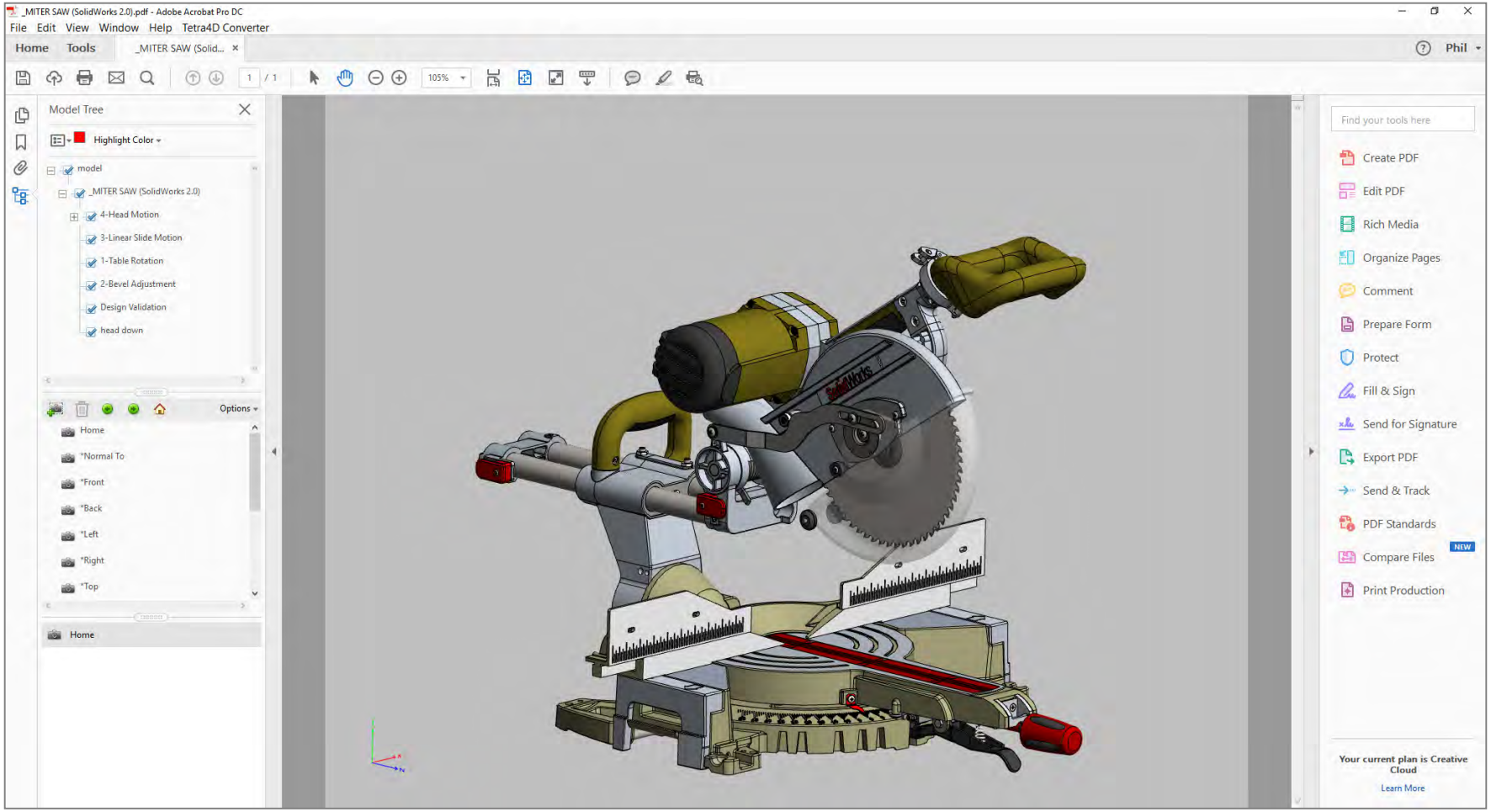
# DRAWING

*2D*


JBS ENGINEERING INC
CONSULTING ENGINEERS
SASKATOON SASKATCHEWAN
1 STAIR SECTION 1
2 STAIR SECTION 2
1 STAIR DETAIL 1
2 STAIR DETAIL 2
revisions
project
client
content
drawn by:
checked by:
date:
drawing no.:
50-A

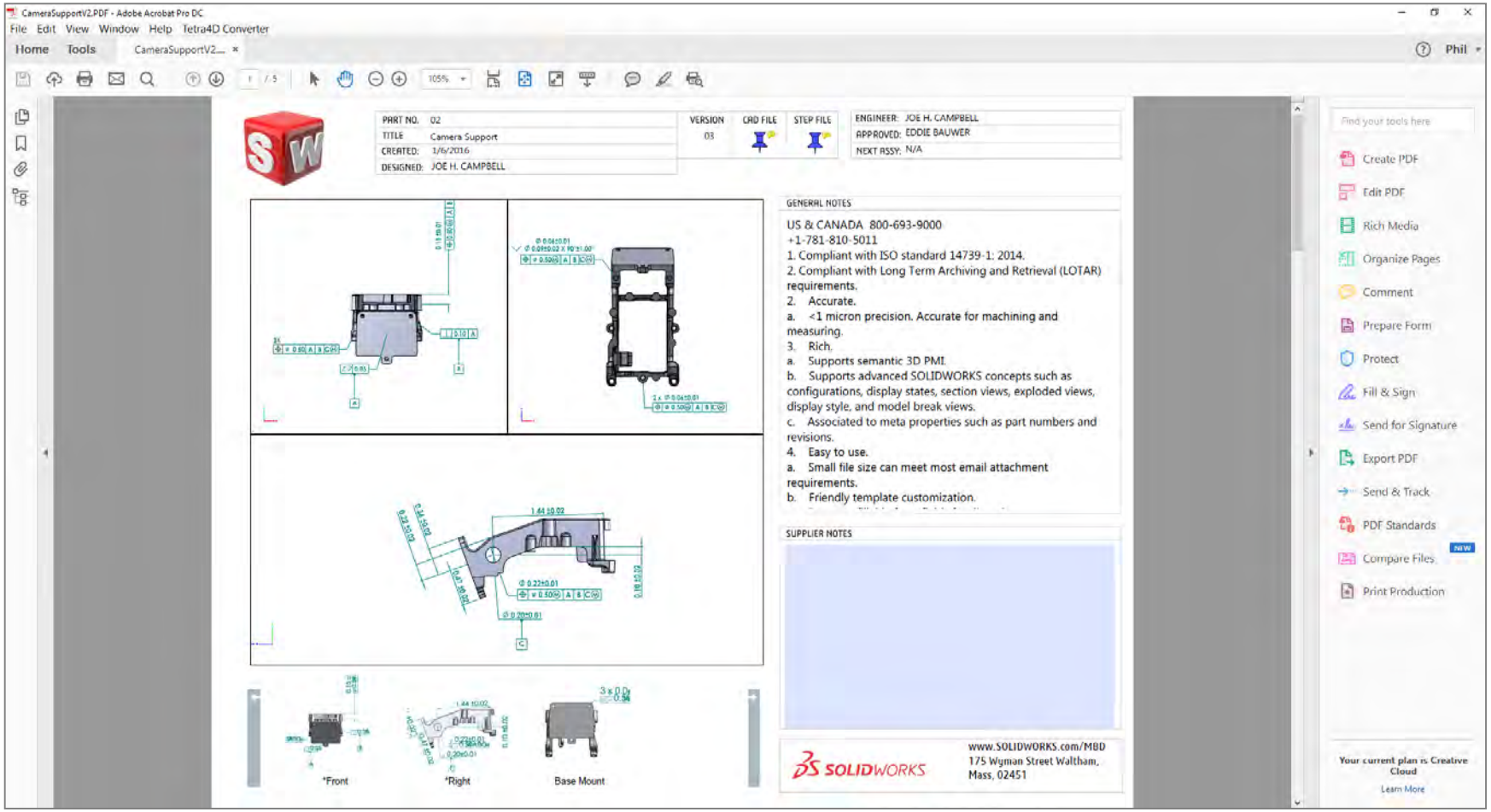
# MODEL

*3D*


_MITER SAW (SolidWorks 2.0).pdf - Adobe Acrobat Pro DC
File Edit View Window Help Tetra4D Converter
Home Tools
_MITER SAW (Solid...
Phil
Model Tree
Highlight Color
model
_MITER SAW (SolidWorks 2.0)
4-Head Motion
3-Linear Slide Motion
1-Table Rotation
2-Bevel Adjustment
Design Validation
head down
Options
Home
*Normal To
*Front
*Back
*Left
*Right
*Top
Home
Find your tools here
Create PDF
Edit PDF
Rich Media
Organize Pages
Comment
Prepare Form
Protect
Fill & Sign
Send for Signature
Export PDF
Send & Track
PDF Standards
Compare Files
NEW
Print Production
Your current plan is Creative Cloud
Learn More

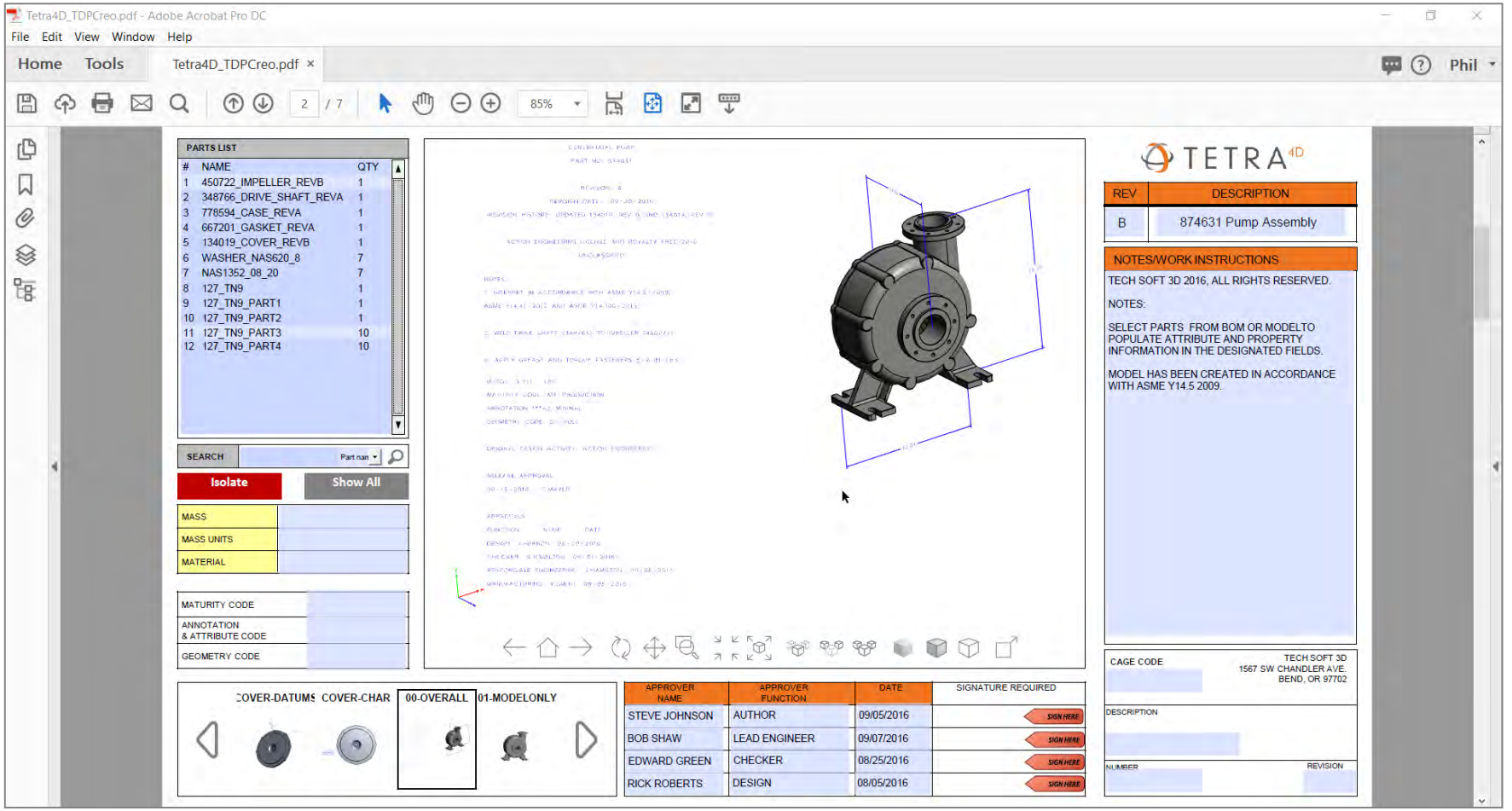
# PMI

*Product and Manufacturing Information*



# TDP

## *Technical Data Package*

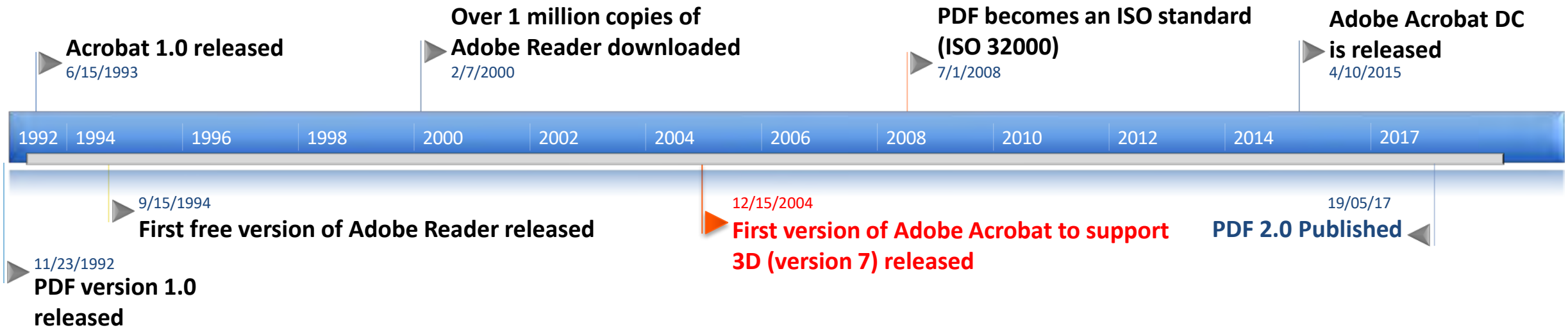


**PDF is the only open format capable of logically archiving engineering data, documents, records and archives**

# PDF FOR ENGINEERING

# 3D PDF

*A Brief History*



# ENGINEERING DOCUMENTATION LANDSCAPE

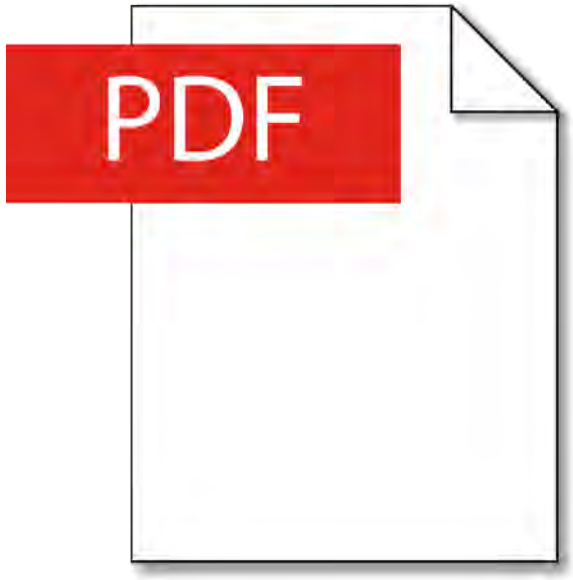
*2017*

- 3D PDF currently published natively from:


- 3D PDF Solutions available for most popular CAD programs
  - Autodesk AutoCAD®
  - CATIA ™
  - Siemens NX™

# INSIDE PDF

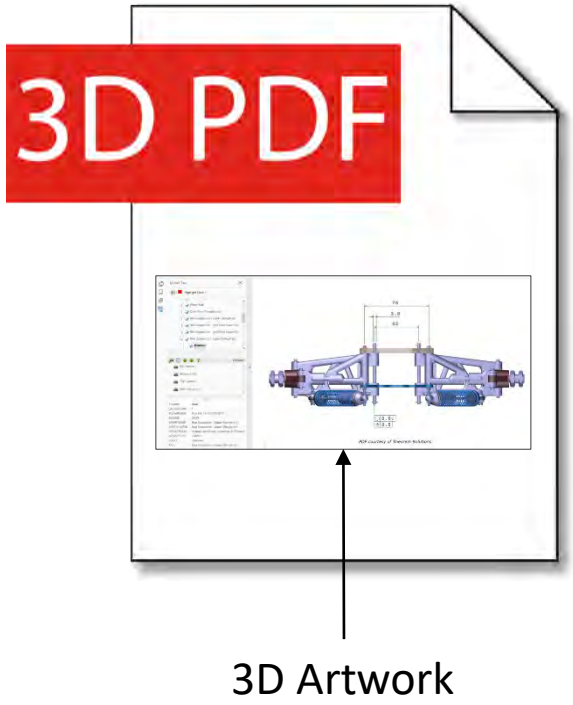
*ISO 32000*




- **Presentation**
- **JavaScript**
- **Markup (XFDF)**
- **Metadata (XMP)**
- **Forms**
- **Attachments**
- **Security**

# INSIDE 3D PDF

*ISO 32000*



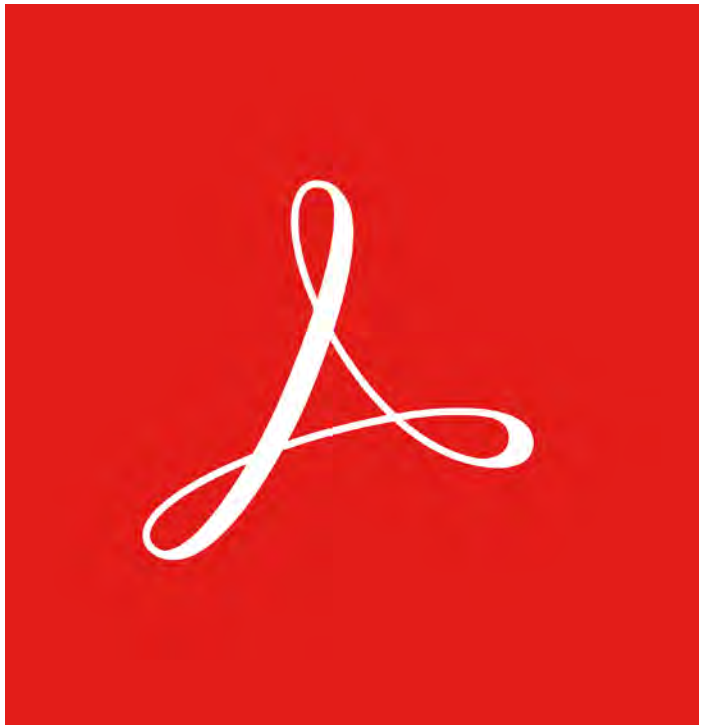

- Presentation
- JavaScript
- Markup (XFDF)
- Metadata (XMP)
- Forms
- Attachments
- Security

- **3D Artwork (model)**
- **3D JavaScript**
- **3D Markup (XFDF)**

# 3D PDF VIEWING

*Best Practices*

- Adobe Acrobat DC or Adobe Acrobat Reader DC
  - Only viewer to support both U3D and PRC
  - Best for PMI (face highlight)
  - No Flash Requirement



# THE BUSINESS CASE FOR PDF IN ENGINEERING

Return on Investment (ROI)

# MBD WITH 3D PDF – ROI AT GE POWER

## Creating a digital model-based enterprise

| | | BEFORE | AFTER |
|---|---|---|---|
| Engineering | Integrated and collaborative system, 3D product definition | 2D blueprints up to 8 weeks | 1 hour 3D PDF |
| Manufacturing & sourcing | Rapid & seamless production of products | Manual design of tools and fixtures | Design re-use, automate fixture designs |
| Services | Single source of truth, revision history, and instantaneous updates | Design changes identified via red-line | Design changes directly in model |

MBE + ERP + Predix = Digital Enterprise

GE Digital

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# MBD WITH 3D PDF – ROI AT GE POWER

## Model-based transformation (Greenville, SC)

**Results**

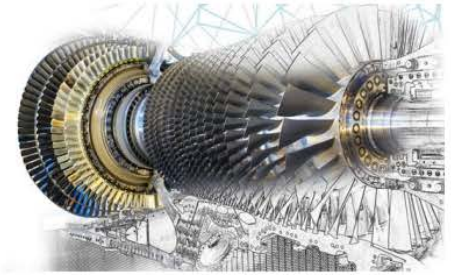
**Design system integration**
Single toolset for aero, heat transfer, stress, vibration analyses

**Design productivity**
Automation delivers 20% labor reduction

**12K digital designs since inception**

**Results**
**$103MM across 3 years**

- ✓ 60 of 200 steps automated/eliminated
- ✓ 530K hours saved across system
- ✓ 30% NPI cycle reduction
- ✓ 40% fewer manual inspection points



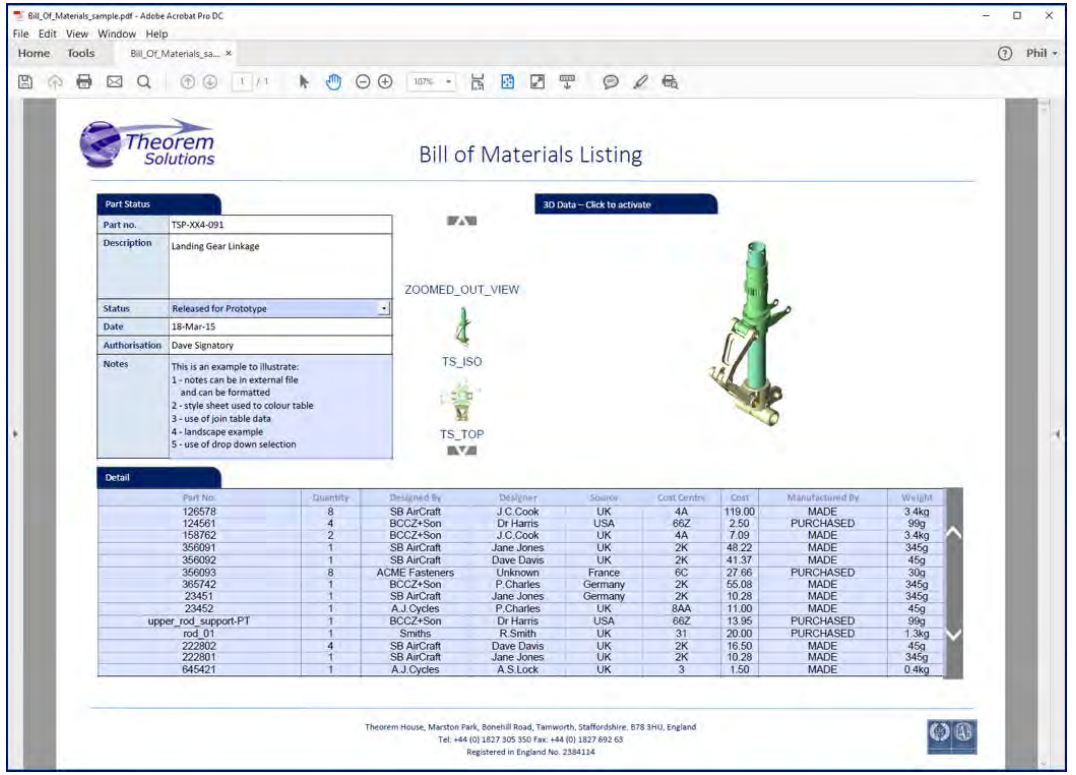
# ARCHIVING TECHNICAL DATA PACKAGES USING 3D PDF

TDP Using ISO Standards

# PDF STANDARDS

*Recommended Practices*

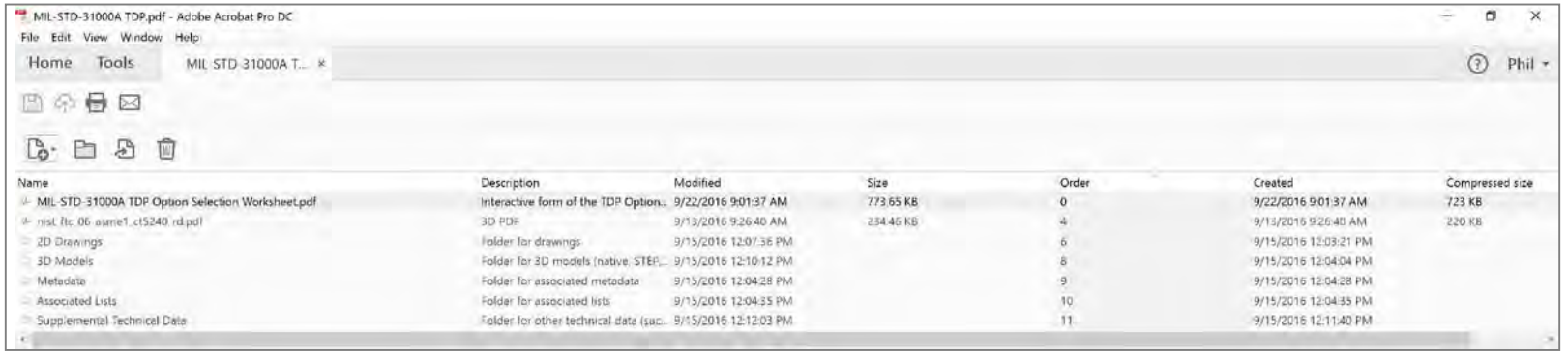
- Use The Best PDF Standards for:
  - 3D
    - ISO 32000 (PDF)
  - 2D
    - ISO 24517 (PDF/E)
  - Text/Images/Documents
    - ISO 19005 (PDF/A)



# ATTACHMENTS AND PORTFOLIOS

*Recommended Practices*

- Add Structure Using Portfolios or Attachments
  - Make sure all attachments have a description
  - Use portfolio folders to logically organize attachments
  - Use hyperlinks to easily open attachments from inside the portfolio

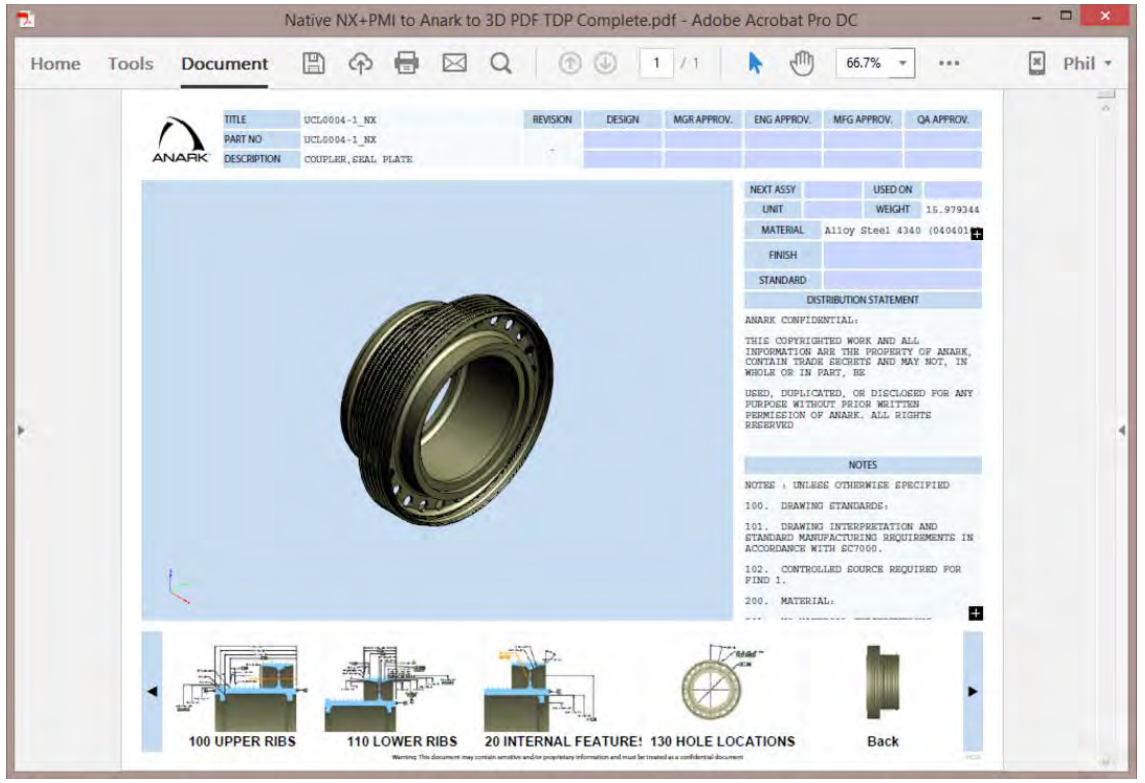



* Acrobat XI requires installing Flash to view portfolios . Acrobat DC is the preferred viewer for PDF portfolios.

# MODEL DATA

*Recommended Practices*

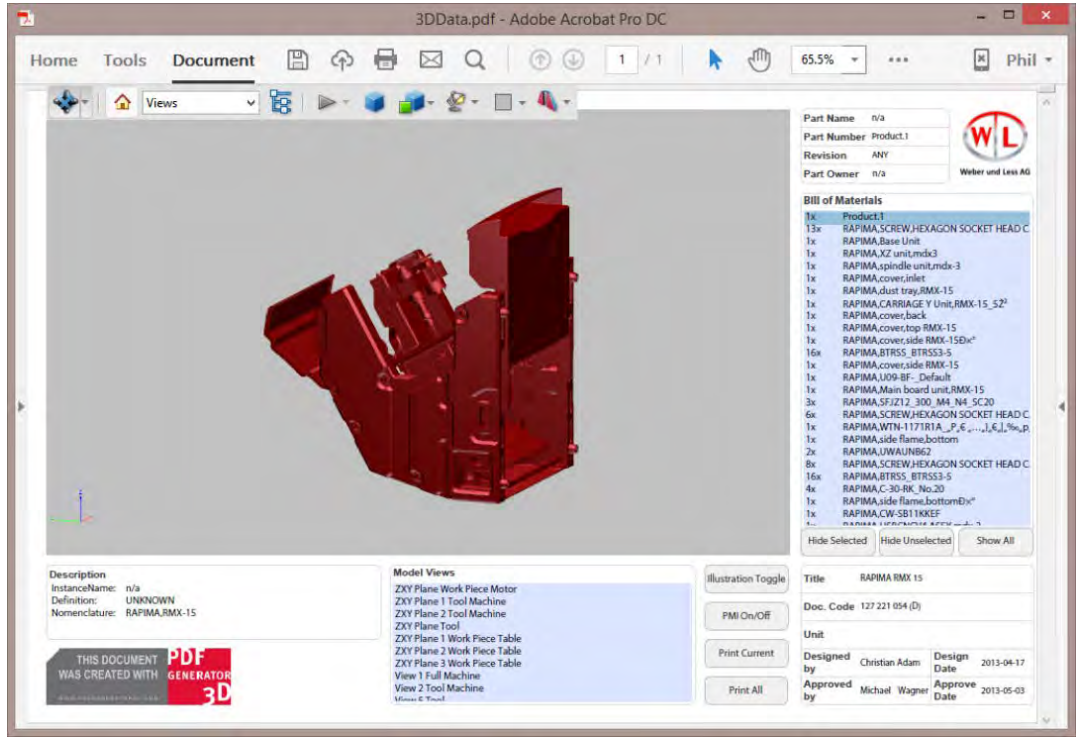
- Use ISO Standards for Model Data
  - PRC (ISO 14739) for visualization
  - Workflows that require a precise CAD model, such as CAM, should attach an 3D definition of the model in an open format (i.e. STEP, X3D, JT, IFC, …)
  - Recommend using STEP AP 242 (ISO 10303:242) for manufacturing documents



# PORTABILITY

*Recommended Practices*

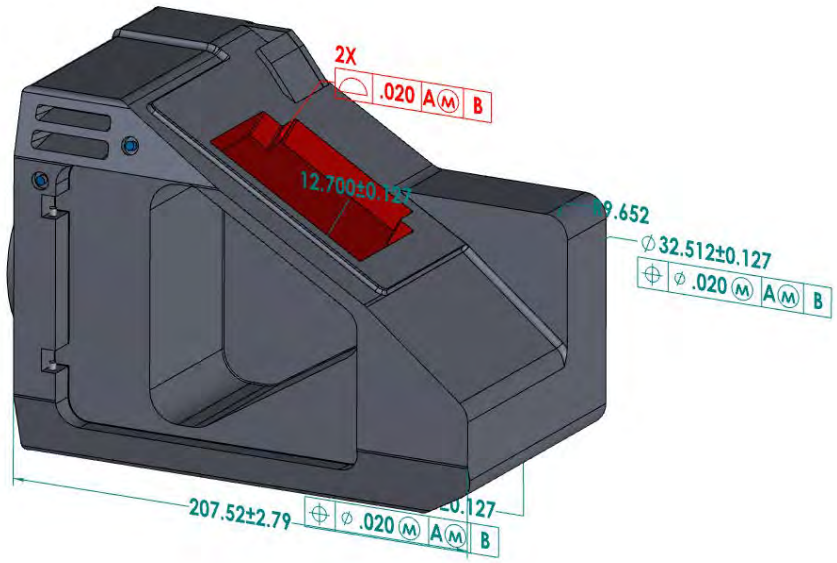
- Ensure Your Document Is Portable
  - Poster Images
  - Watermarks
  - Embedded Fonts
  - Compression



# JAVASCRIPT

*Recommended Practices*

- Use JavaScript to support Annotation Query
  - The Adobe Acrobat Reader, as yet, does not support some of the behaviors necessary to be compliant with CAD standards such as ASME Y14.41, “Digital Product Definition Data Practices.”
  - In most cases, it is possible to satisfy ASME Y14.41 requirements by attaching custom JavaScript to a 3D annotation when creating a PDF file.



# FIND OUT MORE

- Visit the 3D PDF Consortium website:
  - www.3dpdfconsortium.org
- Contact
  - phil.spreier@3dpdfconsortium.org
  - +1-541-241-6223



# THANK YOU!