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Solutions MBD TDP Reference Guide

MAN-00011 / 5

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Effective from: Nov. 16, 2023

MBD: Model Based Definition TDP: Technical Data Package

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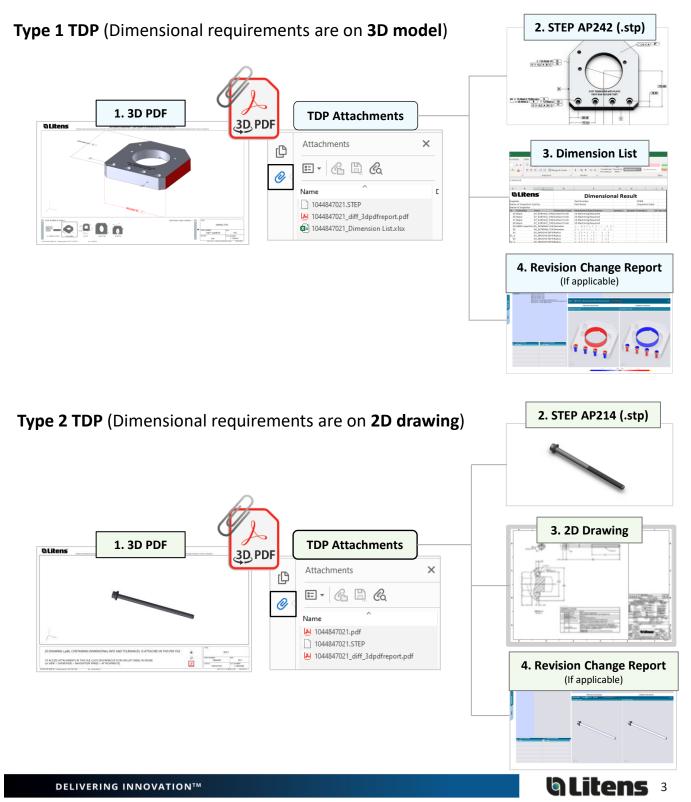
For questions and support, please email the Litens' MBD team **mbdhelp@litens.com**



TDP Overview

A Technical Data Package ("**TDP**") contains the technical description of an item, adequate for supporting acquisition strategies, production, engineering, and quality assurance. The TDP is stored in a single 3D PDF file with attachments.

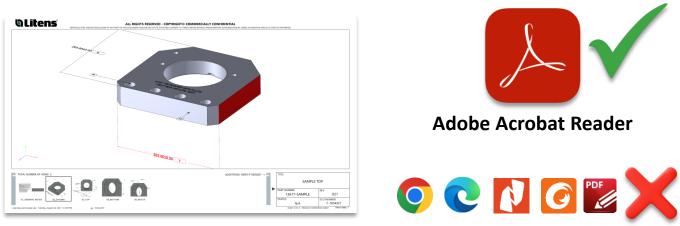
Litens creates two formats for the TDP, depending on the characteristics of the part. The 3D model is always considered as master.



Recommended PDF Viewer – Adobe

Adobe Acrobat Reader is the only recommended reader and must be used for 3D PDFs. Other PDF viewers, such as Microsoft Edge and Google Chrome, do <u>not</u> support 3D models. Please also check Adobe settings against our recommendations in this section.

It is available to download for free on Adobe's site: Link to Adobe

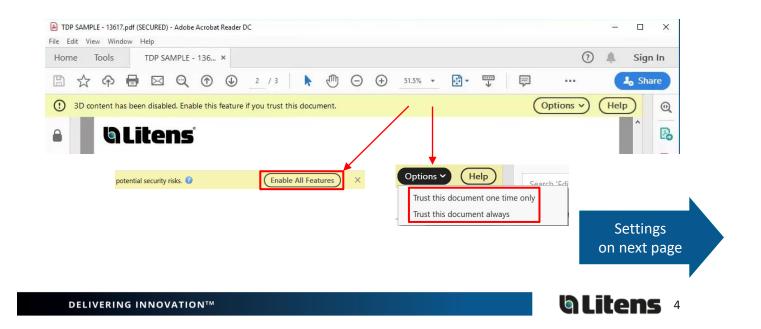


Most PDF readers cannot show 3D model

Recommended Adobe Settings

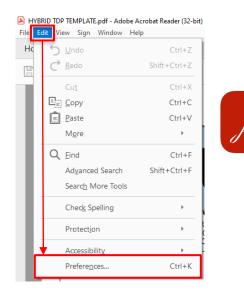
When opening a 3D PDF, a yellow banner may appear over the top saying "3D content has been disabled". Click "Enable All Features" or select "Trust this document..." in the options menu.

Then, adjust your Adobe settings to avoid these yellow notices for future files (next page)



Please use the following Adobe settings for opening 3D PDF's. Otherwise, the 3D content may not work properly. 3D PDF files must be closed for settings to apply.

Go to **Edit > Preferences** at the top toolbar. Check the following categories:



Multimedia & 3D

(It may also be called '3D & Multimedia')

Commenting	Use Flash Player for playing 3D and mythic edia content
ocuments	Enable playing of 3D content
ull Screen	
ieneral	Renderer Options
age Display	Preferred Renderer: DirectX 9
ccessibility	Preterred kenderer: Directors
mail Accounts	Enable hardware rendering for legacy video cards
orms	
dentity	Enable double-sided rendering
nternet	
avaScript	Preferred 3D PMI Rendering Mode: Always render 3D PMI in front of model
anguage	
Aeasuring (2D)	Render points as cross-hairs
Aeasuring (3D) Aeasuring (Geo)	
Aultimedia & 3D	3D Tool Options
Aultimedia (legacy)	
Aultimedia Trust (legacy)	Open Model Tree on 3D Activation: Use Annotation's Setting v
leading	
leviewing	Default Toolbar State: Shown ~
earch	
ecurity	Enable selection for the Hand tool
ecurity (Enhanced)	Consolidate tools on the 3D Toolbar
ignatures	☑ Enable view transitions
pelling	E enable view transitions
racker rust Manager	Show 3D orientation axis
Inits	Auto-Degrade Options
	Auto-begrade options
	Optimization Scheme for Low Framerate: Bounding Box v
	Framerate Threshold:



1. Enable playing of 3D Content > Enable

- 2. Preferred Renderer > DirectX 9 (If not listed, it must be installed. Link for DirectX 9 - Adobe website)
- 3. Preferred 3D PMI Rendering Mode > "Always render 3D PMI in front of model"

Adobe Help Article: <u>Displaying 3D models in PDFs</u> (see 3D preferences)

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Go to Edit > Preferences at the top toolbar. Check the following categories

4. Snap to 3D Content > Enable

Measuring (3D) Settings

Preferences	
Categories:	3D Measuring
Commenting	✓ Use Scale and Units from Model (when present)
Documents	
Full Screen	✓ Use default display unit: Millimeters ~
General	
Page Display	Significant Digits to Display:
3D & Multimedia	3D Measuring Line Color:
Accessibility	
Adobe Online Services	Measure Feedback Size: 30
Email Accounts	
Forms	Angular Measurements Shown In: Degrees
Identity	
Internet	Circular Measurements Shown As: Diameter ~
JavaScript	
Language Measuring (2D)	Show Circle for Radial Measurements
Measuring (3D)	
Measuring (Geo)	3D Snap Settings
Multimedia (legacy)	Snap to 3D Content
Multimedia Trust (legacy)	Shap to 50 content
Reading	Snap to Points Snap to Arcs
Reviewing	
Search	Snap to Edges Snap to Silhouette Edges (Orthographic camera only)
Security	
Security (Enhanced)	Snap to Faces
Signatures	Sensitivity 10
Spelling	Sensitivity: 10
Tracker	Snap Hint Color:
Trust Manager	
Units	

Security (Enhanced) Settings

Preferences 5. Enable Protected Mode at startup Sandbox Protections Categories: Commenting Documents Full Screen > Disable Enable Protected Mode at startup Run in AppContaine Protected View Off General Page Display O Files from potentially unsafe locations O All files 3D & Multimedia 3D & Multimedia Accessibility Email Accounts Forms Lidentity Internet JavaScript Language Measuring (2D) Measuring (2D) Measuring (Geo) Multimedia Tust (legacy) Multimedia Tust (legacy) Enhanced Security Enable Enhanced Security Cross domain log file View Privileged Locations If your workflows are negatively impacted by security settings, use Privileged Locations to selectively trust files, folders, and hosts to bypass those security setting restrictions. Privileged Locations allows you to work securely while granting trust to items in your workflow. Automatically trust documents with valid certification Reading Reviewing Search Security Automatically trust sites from my Win OS security zones View Windows Trusted Sites Signatures Spelling Tracker Trust Manager Units Add File Add Folder Path Add Host Remove What is Protected View? What is Enhanced Security? What are Privileged Locations? (6) Cancel 6. Click OK and close the 3D PDF file for the settings to apply. Х Adobe Acrobat Reader DC — More settings on previous page

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Litens 3D PDF Overview

Sheet 1 – Cover Page

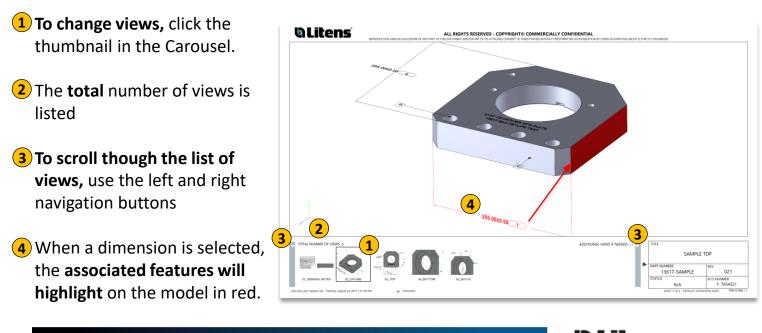
The cover page will show when the 3D PDF is opened. This page includes title-block information and a help section for new users.

CONTRACTOR OF CONTRACT ALL RIGHTS RESERVED - COPYRIGH REPROJUCION AND/OR DECLOSARIO ALL RIGHTS RESERVED - COPYRIGH REPORT OF CONTRACTOR OF UTERS AND/OR ALL RIGHTS RESERVED - COPYRIGH REPORT OF CONTRACTOR OF CONTRACTOR OF CONTRACTOR ALL RIGHTS RESERVED - COPYRIGH REPORT OF CONTRACTOR OF CONTRACTOR REPORT OF CONTRACTOR REPORT OF CONTRACTOR OF CONTRACTOR REPORT OF CONTRACTOR REPORTOR REPORT OF CONTRACTOR REPORTOR REPORT OF	TO COMMERCIAL F ANY PART OF THIS HRD PARTIES WITHOUT TIVE GROUP IS STRIC	LY CONFIDENTIAL	ALL LINEA BURRS, SI MATERIALS HANDLING, PERMISSIBL 3. NO MAN	R DIMENSION HARP EDGES, (E.G., CHIPS, C FUNCTION O E JAL CHANGE 'S TO COMPL'	ILESS OTHEF NS ARE IN MILL CORROSION, C SREASEJ DETRIR R APPEARANCI S. Y WITH CURREI N (SOC) REQUIR	IMETERS MRT OR F MENTAL E ARE NO	OREIGN TO IT	SD PDF HELP ADDEA CADDRAT READER IS REQUIRED TO OPEN THIS FILE PROPENY, ADDITIONALIY, CHECK THE FOLLOWING SETTINGS TO VEW THE 3D CONTENT: Edit > Preferences > 30 at Multimidia > Enable box "Enable playing of 3D Content" Edit > Preferences > Security (Trahandd > Diabale box "Enable Protected Mode at Starup" SHEET > - MODEL VIEW SHEET 3 - OPTIONAL DISPLAY FOR SIDE-8Y-SIDE VIEWS
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DRAWN JANE LIU CHECKED BBBB BBBBBB	APPLICATION STATUS	N/A	PER LITENS CU	RRENT "LITENS	AL CHARACT GLOBAL SUPPLIEI HARACTERISTICS	R MANUAL	* MANUAL &	ATTACHMENTS
APPROVED CCCC CCCCCC DATE (YYY-MM-DD) YYYY-MM-DD	GEOMETRIC TOLER	ME Y14.41-2019 INCES PER IME Y14.5-2009				0	TOTAL ON DATASET	THE FOLLOWING FILES ARE ATTACHED TO THIS 3D TECHNICAL DATA PACKAGE (TDP) PDF: - STEP AP23 (3D MODE) - DIMENSION LIST - REVISION CHANGE REPORT (IF APPLICABLE)
PART MASS TOTAL RIF. REFER TO GENERAL NOTES TABLE CAD SYSTEM SOLIDWORKS 2020	SURFACE TEXTURE ASM CAD DATA OWNER SITE	rer 16 Y14.36M-1996 LAP	OVERALL DIMENSIONS (mm)			9		TO ACCESS THESE ATTACHMENTS, OPEN THIS FILE USING ADOBE ACROBAT READER AND GO TO:
U!\13617 TDP\13617 - REV021	CAD FILE			WIDTH 205	THICKNESS 38	SPACE	DIAGONAL 292	View > Show/Hide > Navigation Panes > Attachments

Sheet 2 - Model View

The second page contains all model views, including general notes and an embedded 3D model. Dimensional Information will be on the 3D model only for the *Type 1 TDP*.

Listed are 4 key functions, for *Type 1 TDP* only:

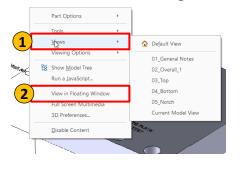


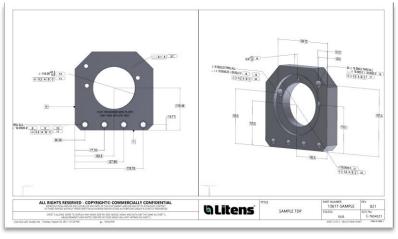
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Sheet 3 - Side-by-Side View

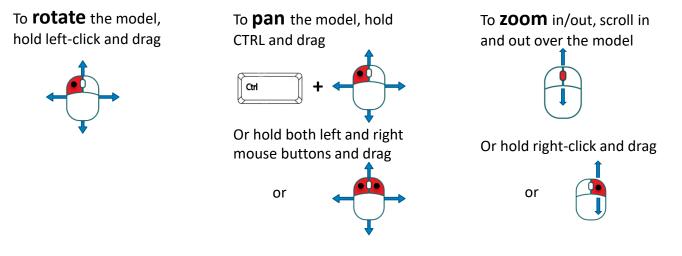
The third page displays a side-by-side view of the model. Note: Sheet 3 will only be included on the *Type 1 TDP*.

- 1 To change views, right click on the model, select "Views" and select the desired view.
- 2 To create a resizable floating window of the view, right click and select "View in Floating Window".





Viewing Tools



Alternatively, use the icons in the toolbar to access the viewing tools



Additional Adobe Help Articles:

- <u>Displaying 3D models in PDFs</u>
- Interacting with 3D models

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Viewing TDP Attachments

Attachments can include a STEP (.stp) file, Dimension List, 2D drawing and a Revision Change Report (if applicable). It will depend on the TDP type, please refer to <u>page 3</u>. Adobe Acrobat Reader is recommended, not all PDF viewers (eg. Google Chrome, Microsoft Edge) support PDF Attachments

To access attachments:

- 1. Open the 3D PDF/TDP in Adobe Acrobat Reader 3. Click the Attachments icon
- 2. Click arrow to show the menu

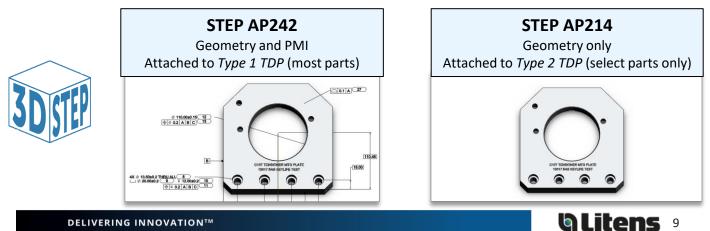
4. Right-click a file and select **Save Attachment**. Files can be opened or saved

	TUP SAMPLE File Edit View Sign Window Help Home Tools TDP SAMPLE	File Edit View Si Home Tools	File Edit View Sign V Home Tools	17.pdf (SECURED) - Acroba Window Help NPD-9002927.pdf	t Reader (32-bit) TDP SAMPLE 2021 ×		
Adobe Acrobat Reader	ALL RIGH REPRODU ANY OF AUTH TITLE PART NUI	₽ ₽ €		Description ListxIsx	Qpen Attachment Save Attachment		
Tip: To always show the attachment list when opening PDF's: Right-click over Attachments () and select Pin Attachments . To hide this panel: Right-click over Attachments () and select Unpin Attachments. Pin Attachments () and select Unpin Attachments.							

STEP (.stp)

A STEP file is a neutral CAD format that is compatible with different CAD programs. The STEP AP242 file format contains PMI (Product Manufacturing Information), while other STEP formats (eg. AP203, AP214) do not support PMI. Check your software to see if it supports STEP AP242 files and/or the embedded PMI.

The STEP AP242 format will be used for *Type 1 TDP* files. The STEP AP214 format will be used for *Type 2 TDP* files.



Dimension List

The dimension list is an Excel sheet that is automatically generated using the MBD model. It which will list dimensions, GD&T, notes and table entries. This sheet can be used during inspection for digital measurement results.

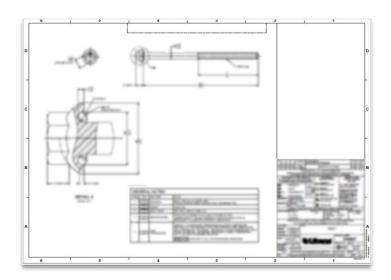
Name of Inspe Name of Inspe			Part Name		Inspection Da	te
ID Criticalit		Dimension Type	Description/Specification	Sample 1	Sample 2 Sample 3	OK Not OK Comment
13	03 FRONT	Flatness		oumpio 1	2 ampie 2 dampie d	
14	04_RIGHT	Diameter	35.55 - 35.75			
15	03_FRONT	SurfaceProfile	☐ [0.50]A]			
16	06_LEFT	Diameter	24.5 - 24.8			
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18 Major	04_RIGHT	Radius	20.90 - 20.95		GD&	Fentries use a font called "SV
19	03_FRONT	SurfaceProfile	□ 0.20 A			
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21	04_RIGHT	Diameter	4 1 . 5 - 4 1 . 7			Link to download font
22	04_RIGHT	Position	⊕ Ø0.04 A B □			LINK LO UOWINOAU IONL
23	04_RIGHT	Position	⊕ Ø0.20 A B			
	on ID and to the 3D					

The Dimension List file will be on the *Type 1 TDP* only.

2D Drawing

A 2D drawing file contains the dimensional information and tolerances. It will be created for select parts only, based on part and manufacturing characteristics. When a TDP contains a 2D drawing, the 3D model will still be master and a STEP214 (.stp) file will be attached to the TDP for geometry information.

The 2D drawing file will be on the *Type 2 TDP* only.

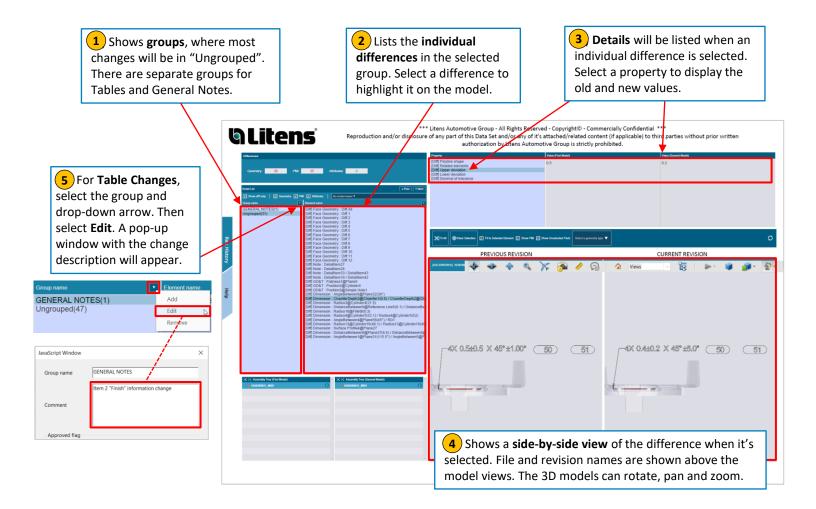


Revision Change Report (if applicable) (1/2)

Revision history will be documented with Revision Change Reports for MBD models. The report contains the geometry and PMI differences between two revisions, with embedded 3D models

The Revision Change Report will be on both Type 1 and Type 2 TDP Files:

- Type 1 TDP The Report will compare both geometry and PMI
- Type 2 TDP The Report will compare geometry only.
 Dimension/Tolerance changes will be documented on the 2D drawing file





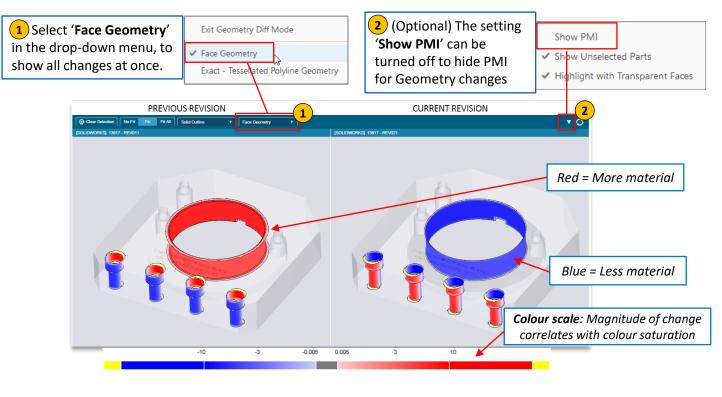
Revision Change Report (if applicable) (2/2)

Additional Information:

	Detail List	Filters to view Geometry or PMI changes only
	Show diff only I Geometry I PMI	Attributes No model views v
	Group name Elem	ent name
	Pulley Table Change(1) [Dif Ungrouped(13) [Dif [Adu [Adu [Dif	Face Geometry : Diff.All Face Geometry : Diff.1 Face Geometry : Diff.2 Face Geometry : Diff.3 I] GD&T : / Surface Profile8 I] GD&T : / Surface Profile7 Dimension : ChamferDepth1 Dimension : Diameter2
[Add] Item v	different in new revision vas added in new revision	Dimension : DistanceBetween7 / Surface Profile7 Dimension : Diameter13 Dimension : Surface Profile3 4] Dimension : / Surface Profile8 n] Dimension : Radius9 /

How to see all Geometry changes at once?

To see individual geometry changes, follow steps #1-4 on previous page



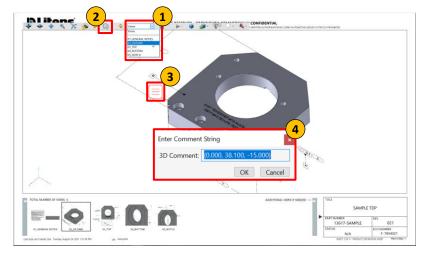


Adding Comments and Measurements in a 3D PDF

Adding Comments

You can add comments to a view:

- Select the desired view
- 2 Click the Add 3D Comment button 😡
- 3 Click on a location on the model to anchor the comment, and then click where you want to place it
- 4 Type the comment in the box that appears (by default, the comment is the anchor's coordinates). Click OK or press ENTER to save.



Additional Adobe Help Article: <u>Commenting on 3D designs in PDFs</u>

Reviewing Comments

The Adobe Comment Tool allows users to:

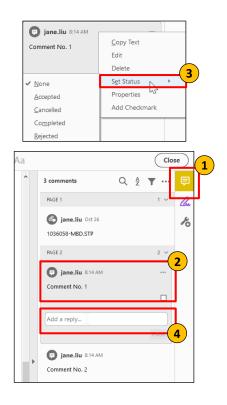
- Reply to a comment
- View previous replies
- Set status on a comment

1 To view comments, click the Comment tool on the right side of the page. A list of all comments and replies will appear

2 When a comment is selected, the corresponding view will be activated, and the comment will be highlighted in the view.

3 To set a status on a comment, select 'set status' in the comment option menu. Next, select the desired status

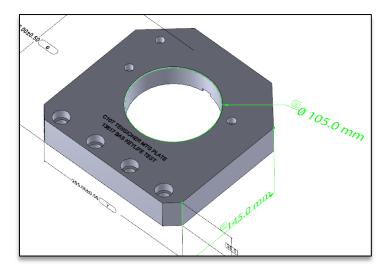
4 **To reply to a comment**, select the comment and type in the reply in the text field. Click 'Post' to post the reply



Additional Adobe Help article: Managing Comments in Adobe



Adding Measurements



Measurements can be added and saved on the 3D model.

To add a measurement:

1. Select the view you want to make the measurement on.

-	 \$	٩	X	٥	st.	B	Datum C	~	\sim	۲	*	• 2	•	4

- 2. Select the 3D Measurement Tool 🤌
- 3. Change unit of measurement (optional; it uses the drawing's units by default)
 - Right click and hover over Display Units
 - Units can also be changed under Edit > Preferences > Measuring (3D)

Cancel Measurement			
Display Units	÷	pt	
Disable Coordinate Display		in	
Disable Measurement <u>M</u> arkup		🗸 mm	\square

4. If needed, use the keyboard shortcuts to view the model from a suitable perspective (the point/line/surface where you begin the measurement should be visible)



5. Enable the suitable Snap Enable(s) and Measurement Type required for the measurement.



6. Hovering over a feature will highlight it when measuring. Click on the feature(s) to take the measurement. Click again to place the measurement.

Additional Adobe Help Article: Measuring 3D objects in PDFs



Revision History

Refer to Compliant Pro for revision release dates.

Revision	Sections Changed	Changes Made
0	-	Initial Release
1	Title page	Released on C-Pro Added Copyright on title page, revision history
2	Recommended Adobe Settings 3D PDF Overview Viewing Attachments	Revised recommended Adobe Security settings Updated 3D PDF template Added more info+examples to Revision History Report
3	-	Added Chinese Translation of document
4	-	Added German Translation of document
5	TDP Overview Recommended PDF Viewer Litens 3D PDF Overview Viewing TDP Attachments	Added information for two different TDP types Added <u>mbdhelp@litens.com</u> to TOC page Updated STEP section to include STEP AP214 Expanded Attachment information Added topic 2D Drawing Updated Revision Change Report - 'How to view all geometry changes at once' Updated Branding