Continuité Numérique
Standard STEP AP 242 – ISO 10303

Tech Soft 3D
Build with the Best

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Stay in touch with Tech Soft 3D
www.techsoft3d.com

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Agenda

- **TechSoft3D Company**
  - Who we are, what we do
- **3D PDF & PRC Format**
  - Open Secured Standard Format
  - PDF and PRC
  - ISO Standard
- **TechSoft3D SDK Product Suite**
  - Javascript SDK
  - Acrobat SDK
  - HOOPS Exchange
  - HOOPS Visualize
  - HOOPS Publish
- **TechSoft3D Cloud & Mobile Product Suite**
  - HOOPS Communicator
  - HOOPS Viewer / 3D PDF Reader for Mobile
- **TechSoft3D Desktop Product Suite**
  - Adobe Acrobat Pro
  - Adobe Acrobat + 3D PDF Converter
- **STEP Format Support**
  - AP 203 E1/E2, AP 214, AP 242

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Company Overview

- **Founded 1996 to provide tools to the 3D Engineering Community**
- **500+ active customers**
- **100% Employee Owned with 70+ Employees Worldwide**
- **Offices in USA, France, Japan and UK**
- **Deep expertise in Visualization and Data Translation**

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3D PDF: What is 3D PDF?

"Container" for the reliable exchange of technical documentation

- Secure distribution of intellectual property
- Reduces costs associated with proprietary viewers and formats
- Reduces costs associated with paper (distribution as well as storage/archive)

Covers 3 primary areas:

- Incorporation of complex data into compact PDF (3D, object-level data, etc.)
- Accurate printing of engineering drawings
- Support for secure exchange/management of annotation and comment data

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The Open, Intelligent Document Format

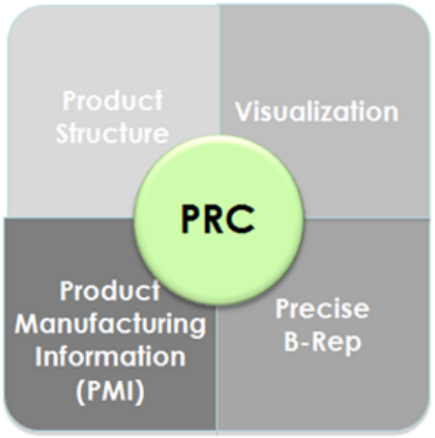
3D content in PDF can be stored as PRC or U3D

Function	U3D	PRC	Notes
ISO standard		+	PRC is now a Standard
Product Structure	+	+	
B-Rep		+	
PMI		+	
Tessellation	+	+	
Animation	+	+*	* PRC can also be animated with Javasrcipt
Compression	+	+	
Material/Texture	+	+	

3D PDF: PDF & PRC

- **Representation of Mechanical Data in 3D PDF Files**

- **Open File Format**
  - The PDF format has been standardized as PDF/E (ISO IS 24517-1:2008) within the framework of ISO IS 32000
  - The PRC format has been standardized as PRC ISO 14739 (TC 71/SC) 2013



- **Highly compressed format that enables storage of large CAD files that are fraction of their originals size**

- **Selectively compresses Visualization and B-Rep data**

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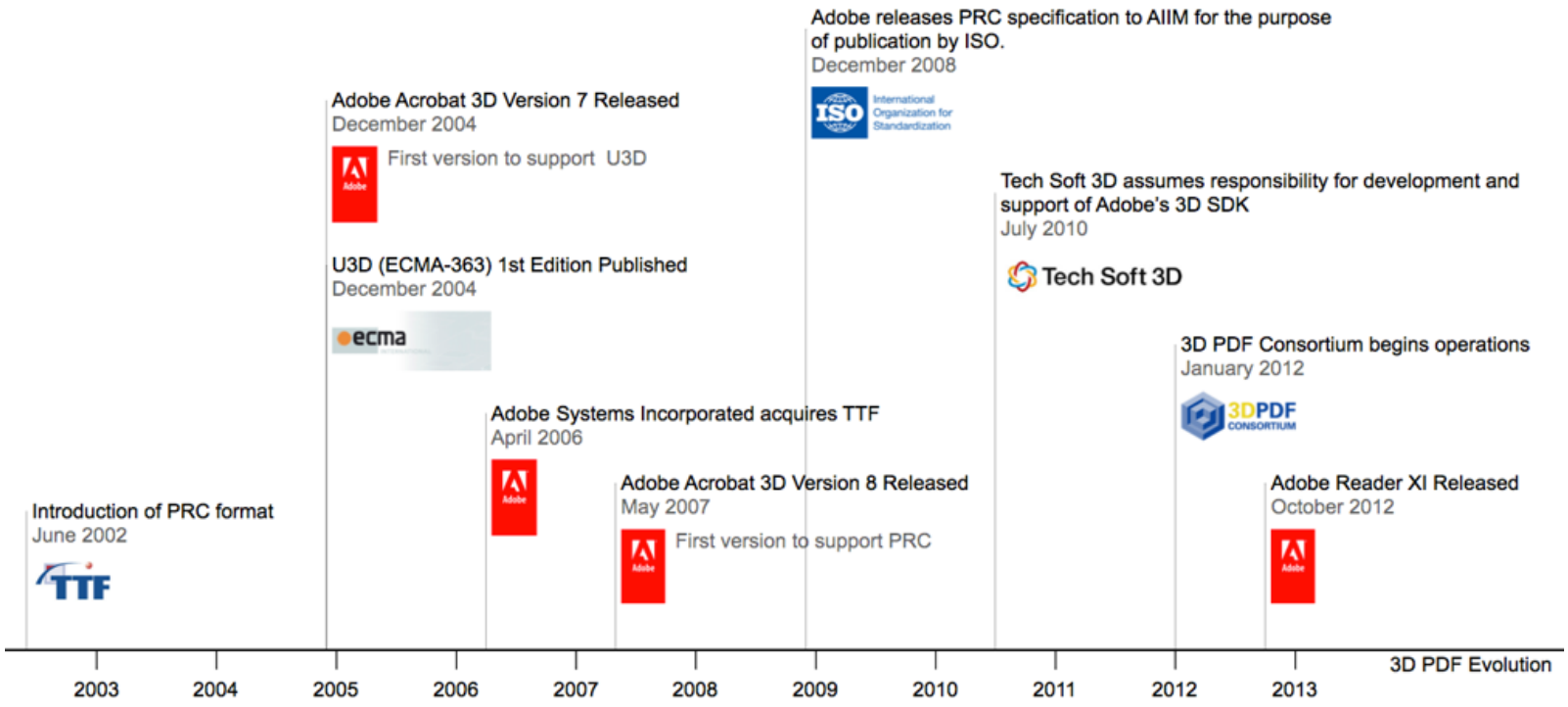
3D PDF: The Evolution of 3D PDF



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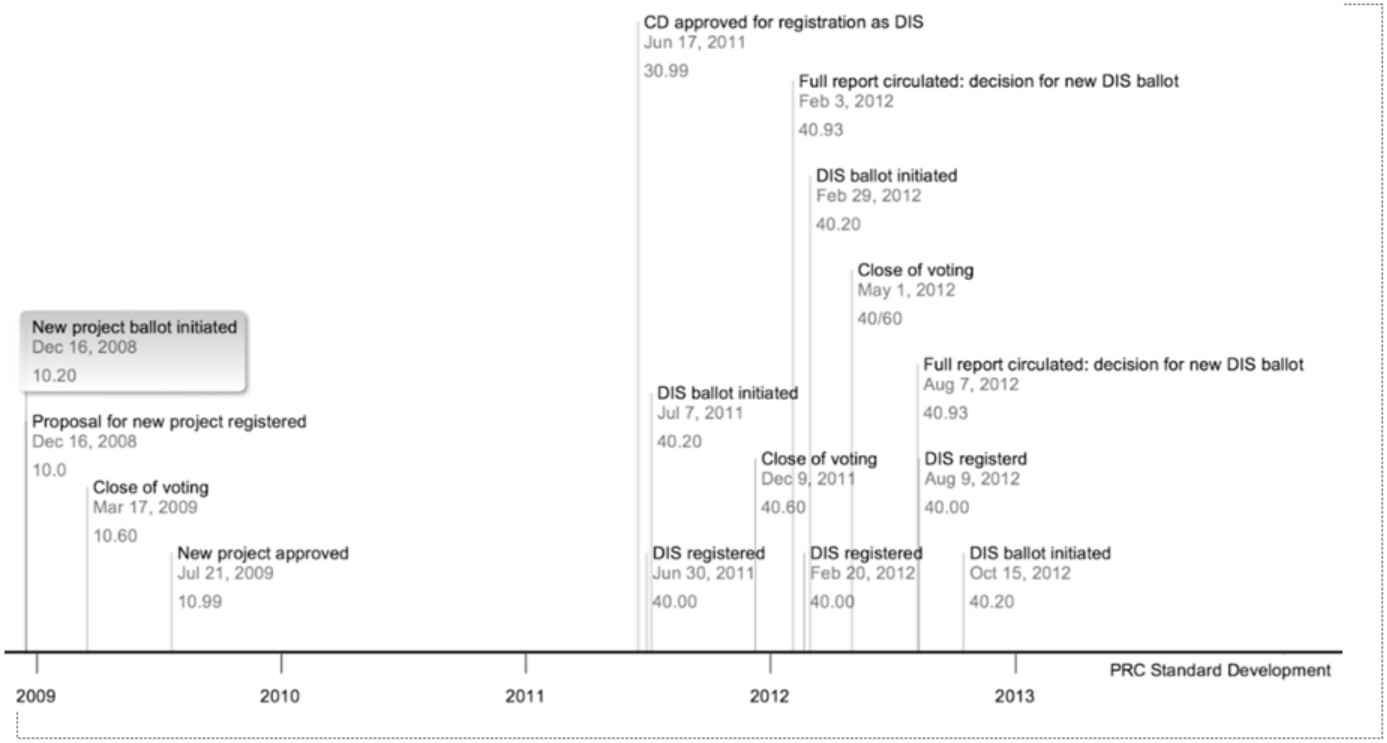
3D PDF: Standardizing PRC - ISO 14739



SDK Product Suite

Tools for Creating and Extending 3D Data

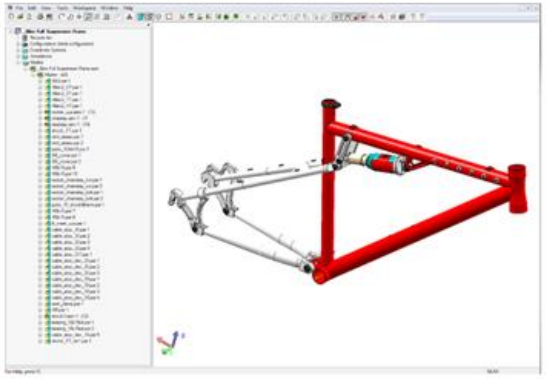
- Acrobat SDK
- Javascript SDK
- HOOPS Exchange
- HOOPS Visualize
- HOOPS Publish

SDK Product Suite: HOOPS Exchange

SDK for translating 3D CAD data into PRC

Product Structure

- **Assembly Tree**
- **External References**
- **Configurations/ Family Tables**
- **Product structure can be read independently of part data**



Very large assemblies can be read using only the memory required for the largest part

SDK Product Suite: HOOPS Exchange

SDK for translating 3D CAD data into PRC

Visualization

- Reads native tessellated model directly from source file when available
- Tessellates B-Rep geometry when native tessellation not available
- Visualizes PMI
  - No need to calculate placement for PMI – it is all done automatically for you

SDK Product Suite: HOOPS Exchange

SDK for translating 3D CAD data into PRC

B-Rep

- **Topology**

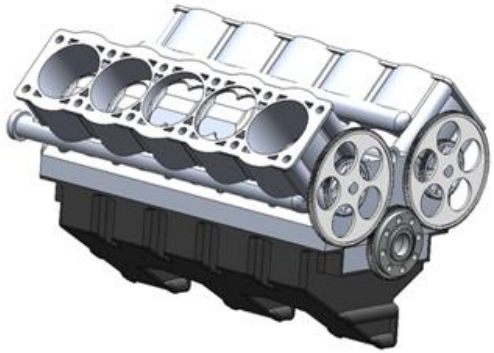
  Complete topological description

- **Geometry**

  Points, coordinate systems, polyhedra, curve and surface definitions

  Maintains periodic and parametric definition for curves/surfaces

  All surface geometry can be converted to NURBS representation



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SDK Product Suite: HOOPS Exchange

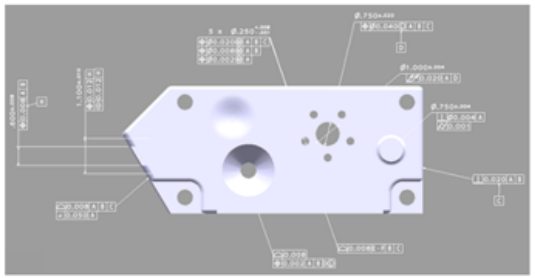
SDK for translating 3D CAD data into PRC

PMI (Product and Manufacturing Information)

- **Full Visual PMI**

  HOOPS Exchange captures the PMI information "as is" by representing the annotations and symbols as individual lines and arcs.

  Associative with the model B-Rep



- **Full Semantic PMI**

  Adds all the positioning, styling and other information, so that an importing system can fully re-create the PMI information in the 3D model

  Offers this data in machine-readable data structures

SDK Product Suite: HOOPS Exchange

SDK for translating 3D CAD data into PRC

Metadata

- Name
- Persistent ID
- Style
- Layer
- Show/Hide
- Coordinate System

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TS3D Product Suite: Format Support

HOOPS Exchange Import

HOOPS Exchange Import provides the capability to read data from the popular 3D formats listed below:

Format	Version	Extensions	Tess	BREP	PMI
ACIS ®	Up to v23.0	SAT, SAB	●	●	●
Autodesk Inventor	Up to 2014	IPT, IAM	●	●	●
CATIA V4	Up to 4.2.5	MODEL, SESSION, DLV, EXP	●	●	●
CATIA V5	R4 to V5-6R2013	CATDrawing, CATPart, CATProduct, CATShape, CGR	●	●	●
CATIA V6	2011 to 2013	3DXML	●	●	●
Creo	Elements/Pro 5.0 Parametric 2.0	ASM, NEU, PRT, XAS, XPR	●	●	●
I-deas	Up to 13.x (NX 5), NX I-deas 6	MF1, ARC, UNV, PKG	●	●	●
IFC	IFC2x Editions 2, 3 and 4	IFC, IFCZIP	●	●	●
IGES	5.1, 5.2, 5.3	IGS, IGES	●	●	●
JT	Up to 9.5	JT	●	●	●
Parasolid	Up to v26.0	X_B, X_T, XMT, XMT_TXT	●	●	●
PDF	All Versions	PRC	●	●	●
PRC	All Versions	PRC	●	●	●
Pro/Engineer	Up to Wildfire 5	ASM, NEU, PRT, XAS, XPR	●	●	●
Rhino	4, 5	3DM	●	●	●
Siemens PLM Software NX	Unigraphics V11.0 to NX 8.5	PRT	●	●	●
Solid Edge	V19 - 20, ST - ST6	ASM, PAR, PWD, PSM	●	●	●
SolidWorks	Up to 2014	SLDASM, SLDPRT	●	●	●
STEP	AP 203 E1/E2, AP 214, AP 242	STP, STEP, STP.Z	●	●	●
Stereo Lithography (STL)	All Versions	STL	●	●	●
Universal 3D	ECMA-363 (1st, 2nd and 3rd editions)	U3D	●	●	●
VDA-FS	Version 1.0 and 2.0	VDA	●	●	●
VRML	V1.0 and V2.0	WRL, VRML	●	●	●

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TS3D Product Suite: Format Support

HOOPS Exchange Export provides the capability to write data to popular 3D standards listed below:

Format	Extensions	Tess	B-Rep	PMI
ACIS	SAT, SAB	●	●	●
IGES**	IGS, IGES	●	●	●
JT**	JT	●	●	●
Parasolid	X_T	●	●	●
PRC	PRC	●	●	●
STEP**	STP, STEP	●	●	●
Stereo Lithography**	STL	●	●	●
VRML**	VRML	●	●	●
Universal 3D	U3D	●	●	●

HOOPS Publish provides the capability to write data to popular 3D standards listed below:

Format	Extensions	Tess	B-Rep	PMI
PDF	PDF	●	●	●
PRC	PRC	●	●	●
Universal 3D	U3D	●	●	●

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Cloud & Mobile Product Suite

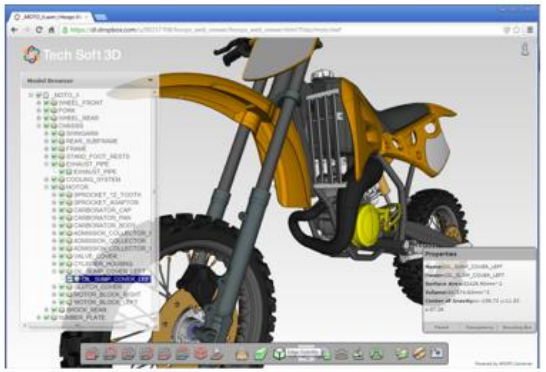
The Migration to Cloud & Mobile

Our Cloud & Mobile Products

HOOPS Communicator

- Product Overview
- Application Workflow
- Role of HOOPS Mobile Viewer
- Target Audience
- Demonstration
- License Fees

Cloud and Mobile Features



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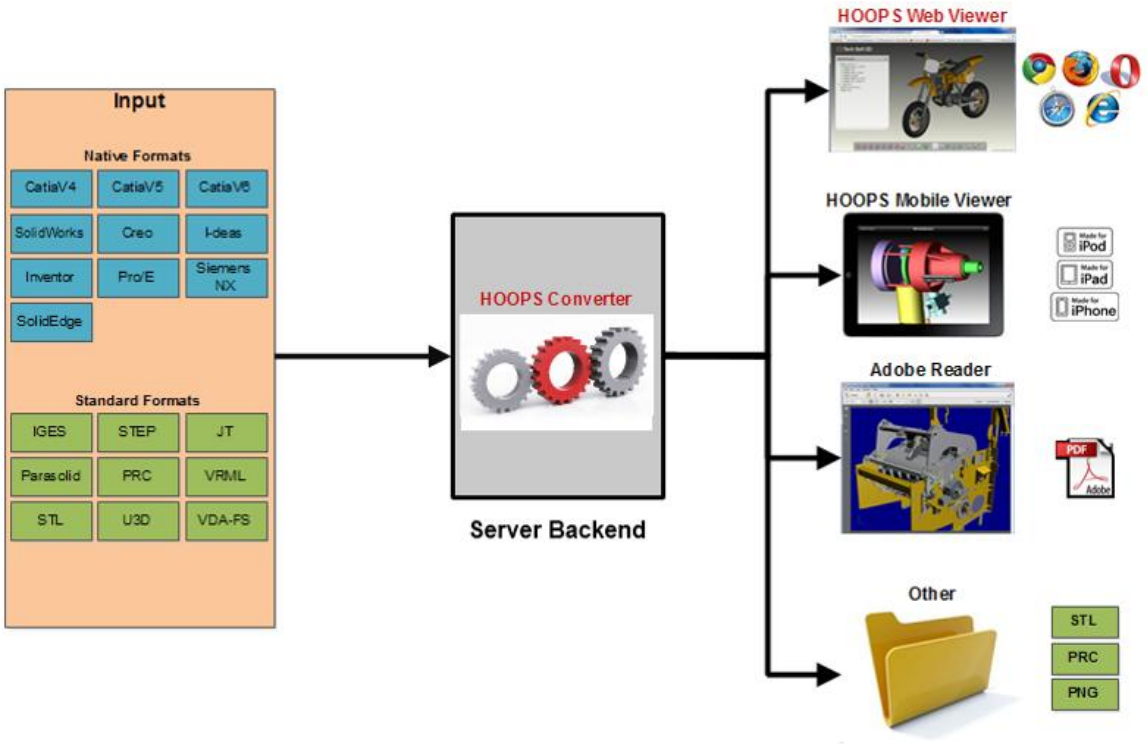
HOOPS Communicator Extended Workflow



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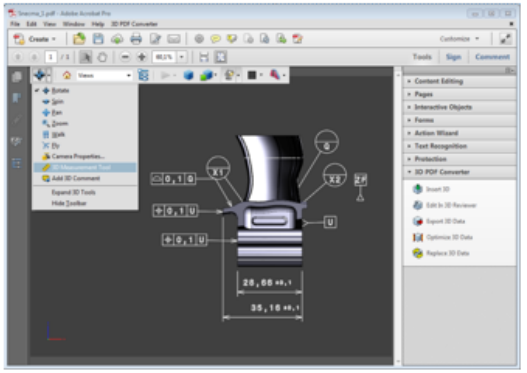
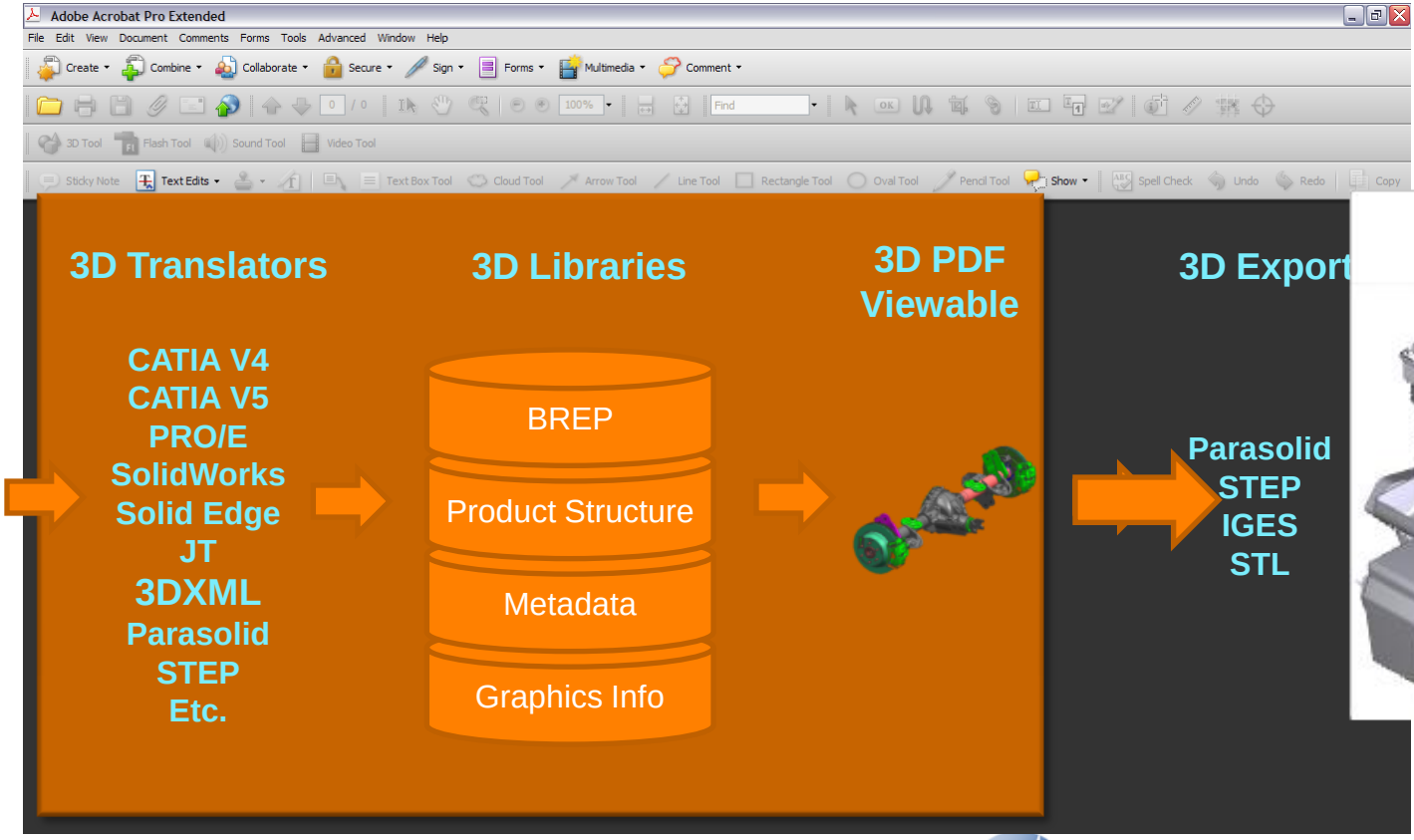
Desktop Product Suite

- **Adobe Reader**
  - Tech Soft 3D involved in Adobe Reader development
  - Free 3D PDF Reader
- **Adobe Acrobat Pro XI**
  - Tech Soft 3D involved in Adobe Reader development
  - Support U3D and PRC import
- **Adobe Acrobat + 3D PDF Converter**
  - Tech Soft 3D is developing 3D PDF Converter
  - HOOPS Exchange CAD format based importer
  - Measurement
  - CAD Export
  - Section
  - Security Protection
  - Data Archiving
  - Compatible with previous version of Adobe Reader
  - Advanced functionalities within 3D Reviewer Product



Desktop Product Suite



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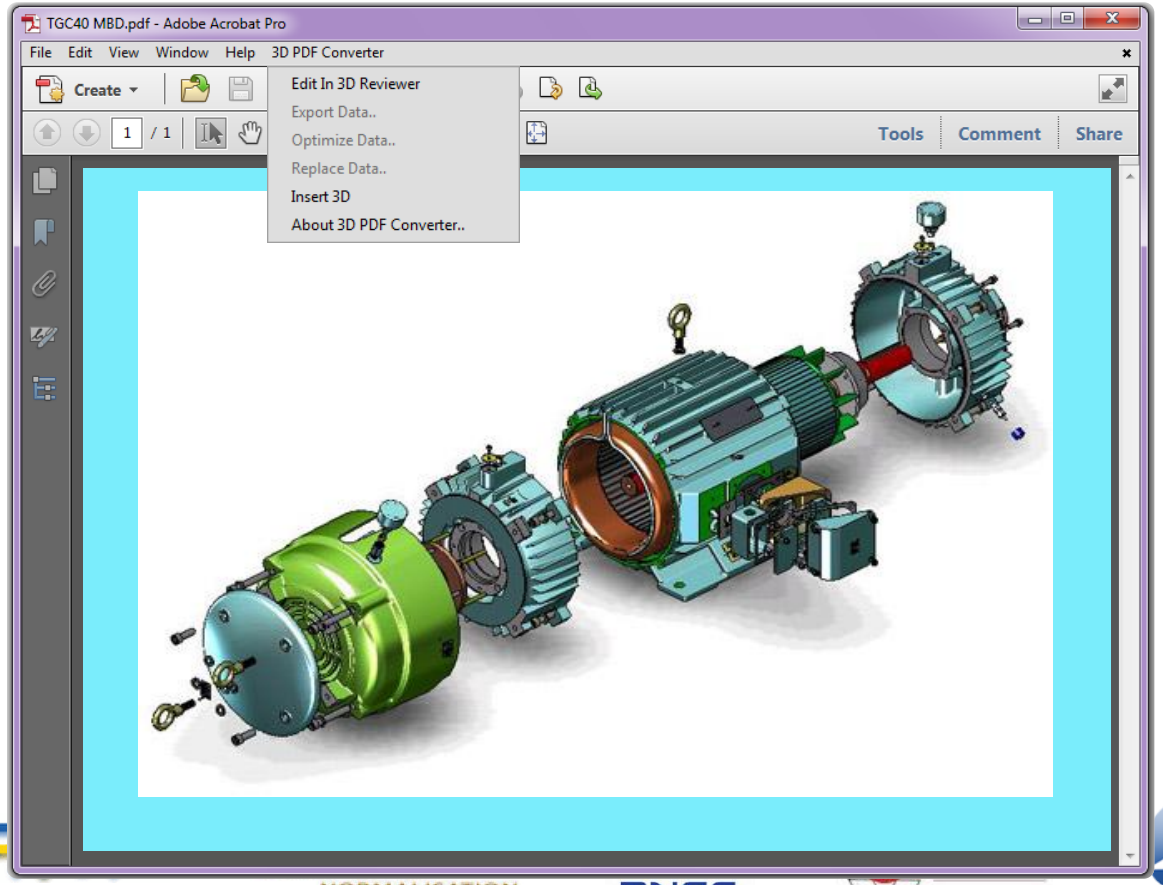
Desktop Product Suite



STEP: TS3D Involvement

- **Active participants in STEP AP 242 process**
  - Support STEP AP242 with an on-going commitment to quickly support new versions
  - Full support for new AP242 features including tessellation and semantic PMI
- **Active members in STEP Community**
  - Members of CAX-IF and LOTAR and close partnership with PROSTEP
  - High-quality marks for our STEP readers from CAX-IF
  - Actively attend relevant conferences and meetings
- **Long-term supporter of STEP**
  - Technology has been supporting STEP since 1996 and always included advanced functionality like PMI and Validation Properties

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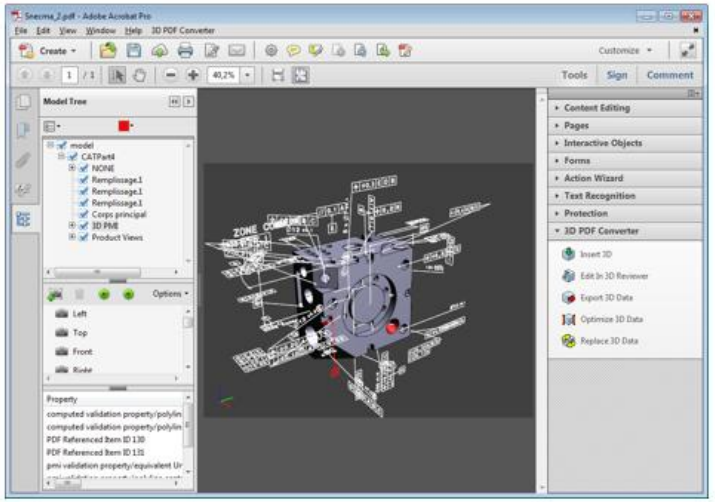
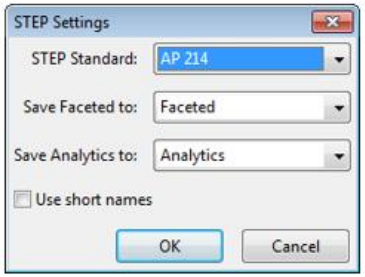
STEP: Format Support

- **Supported by our entire Product Suite**
- **STEP Version Support Import**
  - AP 203 E1/E2, AP 214, AP 242
- **STEP Version Support Export**
  - AP 203, AP 214,





STEP: Feature Support

- **AP 203, 214 & 242 Feature Support**
  - PMI Semantic
  - PMI linked between geometry and PMI
  - PMI Tessellated
  - PMI Polyline
  - PMI Views
  - Compressed step files
  - External References
  - Geometry (Solid Surfaces Wireframes Construction & References elements)
  - Users Attributes
  - Validation Properties
  - Tessellation

- **AP 242 Work on progress**
  - Watertight Tessellation
  - Linked between Geometry and Tessellation
  - Export support
  - Importer enhancement

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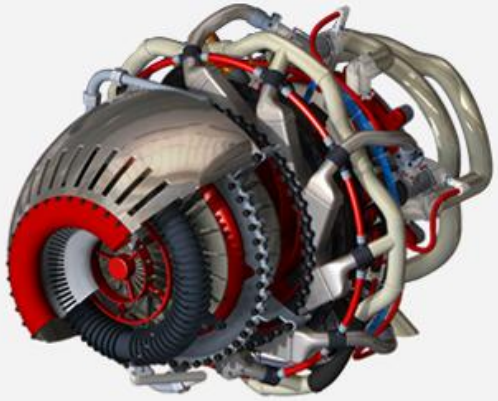
STEP Viewer : SDK for Desktop Developers

Desktop Developers

Even with the shift to cloud & mobile, many users still rely heavily on their high-powered desktop applications to get the job done. We have brought together some of our most popular, high-performance 3D tools to create a **HOOPS Desktop Developer Suite** that will enable you to harness that desktop power, today.



Desktop Developer Benefits

- Read all popular CAD formats
- Provide rich, 3D documentation
- Navigate even the largest data-set
- Integrate 3rd-party modeling tools
- Provide high-performance interaction

Find out more

HOOPS Desktop Developer Suite

- HOOPS Visualize
  fast graphics framework
- HOOPS Exchange
  wide CAD data access
- HOOPS Publish
  rich 3D PDF generation

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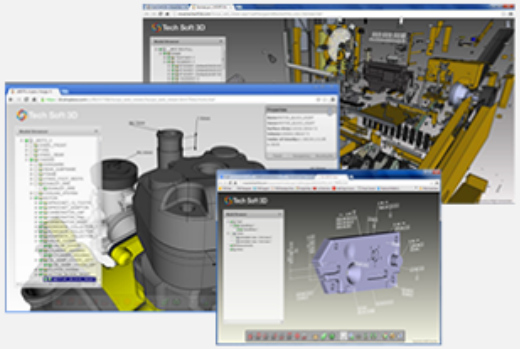
STEP Viewer : Cloud & Mobile

Web Services Providers

If your web service would be enriched by offering advanced 3D, our ready-to-go pre-built components will help you deliver that functionality, fast. See how our growing **HOOPS Web Services Suite** of plug-and-play tools enable you to enhance your service with interactive 3D and rapidly advance your users' online experience.



Web Services Provider Benefits

- Read 3D data in all major formats
- Browser-based or mobile 3D viewing
- No 3D expertise needed
- No software download needed
- Publish rich 3D documents for offline use

HOOPS Web Services Suite

- HOOPS Communicator
  a server executable for file conversion and web and mobile viewing
- HOOPS Mobile Viewers
  free CAD viewers for iOS and Android devices

Find out more

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STEP Viewer : Cloud & Mobile

Web & Mobile Developers

Web and Mobile applications development comes with special challenges. Users still demand all of the 3D power they are accustomed to on the desktop with the flexibility of access from any device. Let us show you how you can deliver that power with our **HOOPS Web & Mobile Developer Suite** of 3D development tools.

Web & Mobile Developer Benefits

- Access CAD data from any CAD source
- View your data from any mobile device
- Batch process CAD files on a server
- Server-generation of 3D PDF documents
- Create one Viewer for all iOS and Android devices

Find out more

HOOPS Web & Mobile Developer Suite

- HOOPS Visualize for Mobile
  portable graphics framework for mobile devices connected to a server
- HOOPS Exchange
  batch translation of CAD data on a server
- HOOPS Publish
  batch creation of 3D PDF workflow documents

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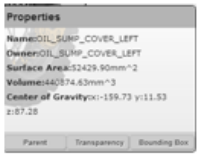
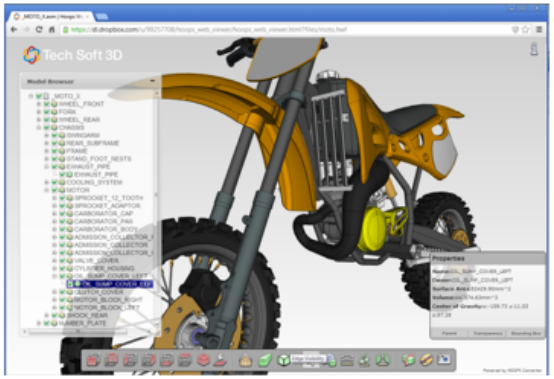
STEP Viewer : Cloud & Mobile

Customizable Validation Properties Reporting

- Easily customize the way properties are displayed
- Standard Properties Panel





- Customized panel to support Validation Properties

Properties
Name : Cover Part Rev 1 Type: Solid Number of faces : 610 Number of triangles : 15640
Physical Properties Centroid (mm): -0.6942, -5.4872, 213.2311 Volume (mm^3): 68656186.5775 Surface Area (mm^2): 1896993.1406
Geometric Validation Properties Centroid (mm) = x=-0.711 , y=-5.495 , z=213.240 Volume (mm^3) = 68599369.24 Surface Area (mm^2) = 1898694.00
Compare | Save

- Physical Properties are calculated on the fly
- Validation Properties are retrieved on the fly
- Others options can be added on demand

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STEP Viewer : Desktop Application

- **Desktop application for viewing and interacting with MCAD data**
  - Widely used within industry today (1,000,000+ users today)
- **High performance**
  - Quick opening of files and fast rendering
- **Deep interrogation capabilities**
  - Ability to query the validation properties
  - Highlight connections between PMI and referenced geometry
  - Deep interrogation of the BREP
- **Support for additional formats**
  - Includes readers for all major MCAD formats
  - Provides export of 3D PDF and STEP & JT

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List of functionalities of your product (TechSoft3D, Adobe Acrobat Pro XI + 3D PDF Converter)

	Type of information	Implemented	Roadmap
CAD	CAD assembly structure (one file)	YES	
	CAD assembly structure (Nested assemblies)	YES	
	3D exact geometry	YES	
	3D tessellated geometry	YES	
	3D PMI graphic presentation	YES	
	3D PMI semantic representation	IN PROGRESS	
	Composite design	IN PROGRESS	
	Kinematic	NO	
	Machining form feature	NO	
	3D paramatric model	YES	
	Construction History	YES	

STEP Implementation formats	Status
BO model XML	NO
ISO 10303-21	YES
Compressed file	YES

Additionnal functionnalities	Status
Geometric Validation Properties	YES
Annotation Validation Properties	YES
Assembly Validation Properties	IN PROGRESS
Saved view Validation Properties	YES
user defined attributes Validation Properties	YES
Color	YES
Invisibility	IN PROGRESS
Detailled conversion report	YES

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Preparation of the 26th of March 2014 conference

List of functionalities of your product (TechSoft3D, Adobe Acrobat Pro XI + 3D PDF Converter)

	Type of information	Implemented	Roadmap
PDM	Part identification (part and version identification, part view,		
	Product struture ("As Design", "As Planned", "As Built", ...)	NO	
	Characteristics (properties, shape association & structure	NO	
	Document management	NO	
	Product breakdown	NO	
	Classification	NO	
	Change management (activities, work management, delta changes	NO	
	Configuration management: effectivities	NO	
	Configuration management: options / specifications	NO	
	Requirement management	NO	
	Process Planning	NO	

	STEP Implementation formats	Status
	BO model XML	NO
	ISO 10303-21	YES
	Compressed file	YES

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Thank You

Please contact

william@techsoft3d.com

If you have any questions