

<b>Key Features</b>	CADIQ compares CAD models of various formats to identify geometric shape and quality differences introduced by engineering changes, translation or manual remodeling. It highlights shape differences in form, mass properties, surface geometry and topology. Quality defects that impede analysis, manufacturing or data exchange processes are clearly identified with no extraneous information. CADIQ analysis uses the native programming interface of each CAD system to maximize accuracy and robustness. Excel statistics are automatically generated to support process quality control. All functionality is available in a command line interface for integration into PLM systems.
<b>New Features in CADIQ 6.1</b>	Direct assembly comparison (no flattening) for V5, NX, Pro/E, SolidWorks, Parasolid and STEP. Assembly comparison diagnostics. Part feature parameter comparison (for model revisions in same CAD system) diagnostics. CATIA V4 CAD file interface for indirect CATIA V4 model analysis (no CATIA V4 installation/license prerequisite) on Windows and AIX platforms. STEP PMI Polyline Presentation quality and comparison (for model revisions in same CAD system) diagnostics. STEP Validation Property quality diagnostics. Improved batch analysis using create_job and controller.
<b>Module</b>	<b>Description</b>
<b>Embedded Launcher</b>	An application that adds CADIQ menus to the CAD system's user interface to make it convenient for a user to set up a Controller job to qualify the working model or to compare it to a model stored in a file on disk. Automates the process of displaying the CAD system model with the same orientation and zoom as in the CADIQ Viewer.
<b>Controller</b>	User interface for creating batch analysis jobs, monitoring their progress in real-time, generating statistics, and loading model diagnostic results into the Viewer. Enables parallel, distributed processing and CAD session sharing to dramatically reduce the time required to analyze a batch of models. Can be executed in batch mode with a command line interface.
<b>Analyzer</b>	Batch CAD application that analyzes a model through a CAD System Interface using diagnostic algorithms and configuration parameters that are consistent across all CAD systems. When comparing two models, this application analyzes the first model (with the appropriate CAD System Interface) and creates a CADIQ results file that becomes an input for a second Analyzer process on the second model (with the appropriate CAD System Interface). Can be invoked through a command line interface if use of the Controller GUI is not desired.
<b>Assembly Analysis Module</b>	Add diagnostics to the Analyzer which enable assembly model quality checking and comparison without flattening.
<b>STEP Validation Properties Module</b>	During validation of a STEP file export, evaluate the mass properties and face sampling points on the native model and append these to the STEP file.
<b>CAD System Interface</b>	Dynamic interface between the Analyzer and a batch CAD session through its application programming interface (API). No data translation or conversion occurs while the model is analyzed. Prerequisites are documented in the Support Matrix.
<b>CAD File Interface</b>	Dynamic interface between the Analyzer and a batch CAD data access process. No prerequisites required for CAD installation/license.

<b>Module</b>	<b>Description</b>
<b>Viewer</b>	Standalone diagnostic user interface for quickly identifying the location and properties of each quality defect or comparison problem. Simultaneously visualizes the analysis results for 1, 2, 3 or 4 related models (same scale and coordinate system). The 3D graphics can be dynamically configured to behave like any supported CAD system. Supports user-defined documentation of diagnostic issues with automated animation between them.
<b>3D PDF Viewer Report Module</b>	Save user-defined documentation of diagnostic issues (saved views with comments and animations) to 3D PDF viewable with the Adobe Reader 8.1.2 or newer.

CAD Format			Diagnostic Functionality				Operating System									
			Geometry	Features	Assembly		AIX		HP-UX	SunOS		Windows				
Name	System API	Version			Flat	Direct	5.2	5.3	11.11	5.8	5.10	XP	XP x64	Vista	Vista x64	Server
<b>CADDS 5i</b>	CV-DORS	14	Yes	No	No	No	n/a	n/a	*	*		6.1	6.1	n/a	n/a	
<b>CATIA V4 (1)</b>	CATGEO	4.2.4	Yes	No	Yes	Tbd	6.1	6.1	6.1	6.1	6.1	n/a	n/a	n/a	n/a	n/a
		4.2.5	Yes	No	Yes	Tbd	n/a	6.1	<b>6.1</b>	n/a	<b>6.1</b>	n/a	n/a	n/a	n/a	n/a
<b>CATIA V4</b>	CADfix CSDK	<b>Any 4.x</b>	Yes	No	Yes	No	<b>6.1</b>	<b>6.1</b>				<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	
<b>CATIA V5 (1) (2)</b>	ABC-CAA	v5r15	Yes	Yes	Yes	Yes			*	*	*	*				
		v5r16	Yes	Yes	Yes	Yes			*	*	*	6.1				
		v5r17	Yes	Yes	Yes	Yes			*	*	*	6.1	6.1			6.1
		v5r18	Yes	Yes	Yes	Yes	n/a		6.1	n/a	6.1	6.1	6.1			
		v5r19	Yes	Yes	Yes	Yes	n/a	<b>6.1</b>		n/a		6.1	6.1	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>
<b>NX (1) (3)</b>	NX Open	NX 3	Yes	Yes	Yes	Yes						6.1				
		NX 4	Yes	Yes	Yes	Yes						6.1	6.1			
		NX 5	Yes	Yes	Yes	Yes						6.1	6.1			
		NX 6	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	6.1	6.1			
		<b>NX 7</b>	Yes	Yes	Yes	Yes	n/a	n/a	n/a	n/a	n/a	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>
<b>NX I-deas (1)</b>	Open I-DEAS	11	Yes	Yes	No	Tbd			*	*	*	6.1				
		12	Yes	Yes	No	Tbd			*	*	*	6.1	6.1			
		NX I5	Yes	Yes	No	Tbd			6.1	n/a	6.1	6.1	6.1			
		NX I6	Yes	Yes	No	Tbd						6.1	6.1	<b>6.1</b>	<b>6.1</b>	
<b>Pro/ENGINEER (1)</b>	Pro/TOOLKIT	WF 2	Yes	Yes	No	Yes	n/a	n/a		*		6.1	6.1			
		WF 3	Yes	Yes	No	Yes	n/a	n/a				6.1	6.1			
		WF 4	Yes	Yes	No	Yes	n/a	n/a				6.1	6.1			
		<b>WF 5</b>	Yes	Yes	No	Yes	n/a	n/a				<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	
<b>SolidWorks (1)</b>	Parasolid	<b>2009</b>	Yes	No	Yes	Yes	n/a	n/a	n/a	n/a	n/a	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	
<b>Parasolid</b>	Parasolid	<b>22</b>	Yes	No	Yes	Yes	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	<b>6.1</b>	
<b>IGES</b>	PDElib	5.3	Yes	No	No	No			*	*	*	6.1	6.1			
<b>STEP</b>	PDElib	Any AP	Yes	No	Yes	Yes	6.1	6.1	6.1	6.1	6.1	6.1	6.1	<b>6.1</b>	<b>6.1</b>	6.1
<b>Prerequisites</b>																
(1)	The CATIA V4, CATIA V5, NX, NX I-deas, Pro/ENGINEER and SolidWorks interfaces require one CAD system runtime license per concurrent CADIQ session.															
(2)	The CATIA V5 interface also requires one 5691-ABC-CAA Multi-Workspace Appl Builder (API) license per CADIQ installation (for any number of concurrent CADIQ sessions). CATIA V5 assembly analysis requires one DF1 license per concurrent CADIQ session.															
(3)	The NX interface also requires one NX Open C/C++ API license per CADIQ installation (for any number of concurrent CADIQ sessions).															
<b>Legend</b>																
<b>Bold font</b>	New configuration developed and tested for this release															
Regular font	Previous configuration upgraded and tested for this release															
*	Previous configuration not upgraded for this release (but could be added as needed)															
Blank	Configuration is technically feasible but not yet developed (but could be added as needed)															
n/a	Configuration is not supported by the CAD vendor															
<b>Released Configurations:</b>																

Level	Diagnostic	Brief Description
Assembly Defects	Duplicate Assemblies	Two or more assemblies are duplicated on top of each other
	Duplicate Parts	Two or more parts are duplicated on top of each other
	Empty Assembly	Assembly contains no part geometry
	Empty Part	Part contains no geometry
	Missing Component	Assembly or part component is missing
Integrity Defects	Degenerate Edge	Edge length is invalid
	Degenerate Face	Face area is invalid
	Degenerate Solid	Solid volume is invalid
	Empty Model	Model contains no entities which satisfy the configuration filters
	Feature Status	Feature has a parametric update error or warning ( <i>I-deas NX only</i> )
	Free Edge	Edge is used by only one face
	Inconsistent Edge in Loop	Parametric direction of edge is inconsistent within its loop
	Inconsistent Edge on Curve	Parametric direction of edge is inconsistent with its curve
	Over-Used Edge	Edge is used by more than two faces
Over-Used Face	Face is used more than once in a solid	
Tooling Defects	High-Curvature Surface	Surface radius of curvature is too small
	Large Round Faces	Connected faces have a large round radius
	Narrow Solid Space	Width of the space between solid features is too small
	Narrow Space Between Solids	Narrow space between adjacent solids in a part
	Narrow Space	Narrow space around a solid formed near a sharp edge between two faces
	Narrow Step	Narrow face or region that does not blend smoothly with adjacent faces
	Narrow Volume	Narrow portion of a solid formed near a sharp edge between two faces
	Non-Standard Hole Faces	Connected faces form a hole with a non-standard diameter
	Non-Tangent Faces	Non-tangent angle between faces connected along an edge
	Sharp Free Edge Angle	Sharp angle between free edges connected at a vertex
	Solid Void	Solid has an internal shell surrounding a void space
	Thick Solid Volume	Minimum thickness of a solid is too thick
	Thin Solid Volume	Minimum thickness of a solid is too thin
	Tiny Hole Faces	Connected faces form a hole with a small diameter
	Tiny Round Faces	Connected faces have a small round radius
Tiny Solid	Solid is too small	
Design Reuse Defects	Embedded Solids	Two or more solids are duplicated on top of each other
	Embedded Shells	Two or more open shells are duplicated on top of each other
	Embedded Faces	Two or more faces are duplicated on top of each other
	Hidden Entity	Independent geometric entity is hidden (not visible, blanked)
	Non-Solid Entity	Independent geometric entity is not part of a solid
	Non-Existent Annotation	<b>Model is incomplete due to non-existence of expected annotation entities</b>
	Non-Existent Saved View	<b>Model is incomplete due to non-existence of expected Saved View entities</b>
STEP Validation Properties	Non-Existent Face ValProp Area	<b>Model is incomplete due to non-existence of expected STEP face area validation property</b>
	Non-Existent Face ValProp Sharp Points	<b>Model is incomplete due to non-existence of expected STEP face sharp point validation properties</b>
	Non-Existent Face ValProp Smooth Points	<b>Model is incomplete due to non-existence of expected STEP face smooth point validation properties</b>
	Non-Existent Model ValProp Area	<b>Model is incomplete due to non-existence of expected model area validation property</b>
	Non-Existent Model ValProp Location	<b>Model is incomplete due to non-existence of expected model location validation property</b>
	Non-Existent Model ValProp Volume	<b>Model is incomplete due to non-existence of expected model volume validation property</b>
	Non-Existent Shell ValProp Area	<b>Model is incomplete due to non-existence of expected STEP shell area validation property</b>
	Non-Existent Solid ValProp Area	<b>Model is incomplete due to non-existence of expected STEP solid area validation property</b>
	Non-Existent Solid ValProp Location	<b>Model is incomplete due to non-existence of expected STEP solid location validation property</b>

Level	Diagnostic	Brief Description
	<b>Non-Existent Solid ValProp Volume</b>	<b>Model is incomplete due to non-existence of expected STEP solid volume validation property</b>
<b>Exchange Defects</b>	High-Curvature Curve	Curve radius of curvature is too small
	High-Degree Curve	Degree of a spline or polynomial curve is too high
	High-Degree Surface	Degree of a spline or polynomial surface is too high
	Large Edge Gap	Large distance between the endpoints of edges connected at a vertex
	Large Edge Face Gap	Large distance between an edge and its underlying face
	Large Face Gap	Large distance between faces connected along an edge
	Large Patch Gap	Large distance between connected surface patches
	Large Segment Gap	Large distance between connected curve segments
	Large Vertex Edge Gap	Large distance between a vertex and its underlying edge
	Large Vertex Face Gap	Large distance between a vertex and its underlying face
	Non-Tangent Segments	Non-tangent angle between connected curve segments
	Sharp Face Angle	Sharp angle between faces connected along an edge
	Tiny Patch	Surface patch is too small
	Tiny Segment	Curve segment is too short
Untessellated Face	Face is not tessellated	
<b>Simulation Defects</b>	Closed Edge	Edge endpoints are coincident
	Closed Face	Face edges on opposite sides are coincident
	Fragmented Edge	Portion of spline/polynomial curve used by edge has too many segments
	Fragmented Surface	Spline or polynomial surface has too many patches
	Intersecting Loops	Two loops on a face have a close proximity where they are not connected
	Self-Intersecting Loop	A loops has a close proximity to itself where it is not connected
	Narrow Face	Face is consistently narrow in one direction
	Narrow Region	Narrow portion or extension of a face
	Non-Tangent Edges	Non-tangent angle between edges connected at a vertex
	Over-Used Vertex	Vertex used by too many edges
	Sharp Edge Angle	Sharp angle between edges connected at a vertex
	Tiny Edge	Edge is too short
	Tiny Curve	Curve is too short
	Tiny Face	Face is too small
Tiny Surface	Surface is too small	
<b>Design Information</b>	Feature Faces	Set of faces created by a parametric design feature
	Feature Edges	Set of edges created by a parametric design feature
	Multi-Solid Model	Model contains more than one solid
	<b>Annotation Attributes</b>	<b>Set of faces and edges associated to a PMI annotation</b>
	<b>Saved View Attributes</b>	<b>Set of faces and edges associated to PMI annotations referenced by a PMI saved view</b>
	<b>Planar Solid</b>	<b>Solid is defined by only planar faces</b>

Level	Diagnostic	Brief Description
Assembly Shape Changes	Unmatched Left Assembly	Assembly component in the left model does not have a matching assembly component in the right model
	Unmatched Right Assembly	Assembly component in the right model does not have a matching assembly component in the left model
	Unmatched Left Part	Part component in the left model does not have a matching part component in the right model
	Unmatched Right Part	Part component in the right model does not have a matching part component in the left model
Assembly Form Changes	Complex Assembly Match	Two or more assembly components in the left-hand model match two or more assembly components in the right-hand model
	Complex Part Match	Two or more part components in the left-hand model match two or more part components in the right-hand model
Assembly Property Changes	Different Assembly Area	Matching assembly components have a significant area difference
	Different Assembly Location	Matching assembly components have a significant centroid location difference
	Different Assembly Volume	Matching assembly components have a significant volume difference
	Different Part Area	Matching part components have a significant area difference
	Different Part Location	Matching part components have a significant centroid location difference
	Different Part Volume	Matching part components have a significant volume difference
Shape Changes	Shifted Faces	Matching faces have a major shape change
	Shifted Edges	Matching sharp edges have a major shape change
	Unmatched Left Solid	Solid in the left model does not have a matching solid in the right model
	Unmatched Left Shell	Shell in the left model does not have a matching shell in the right model
	Unmatched Left Faces	Connected faces in the left model have no matching faces in the right model
	Unmatched Right Solid	Solid in the right model does not have a matching solid in the left model
	Unmatched Right Shell	Shell in the right model does not have a matching shell in the left model
	Unmatched Right Faces	Connected faces in the right model have no matching faces in the left model
	Unmatched Left Feature	Feature in the left model does not have a matching feature in the right model
	Unmatched Right Feature	Feature in the right model does not have a matching feature in the left model
	Unmatched Left Annotation	PMI annotation in the left model does not have a matching PMI annotation in the right model
	Unmatched Right Annotation	PMI annotation in the right model does not have a matching PMI annotation in the left model
	Unmatched Left Saved View	PMI saved view in the left model does not have a matching PMI saved view in the right model
	Unmatched Right Saved View	PMI saved view in the right model does not have a matching PMI saved view in the left model
Shape Deviations	Deviant Faces	Matching faces have a significant shape deviation
	Deviant Feature Faces	Feature faces in the left-hand model (F') differ in shape from the matching feature faces (F) in the right-hand model
	Deviant Edges	Matching sharp edges have a significant shape deviation
Form Changes	Different Entity Count	The top-level entity counts (solids, open shells, unsewn faces, etc) are different between the two models
	Sewn Shell	One or more open shells and/or unsewn faces in the left model match one open shell in the right model
	Sewn Solid	One or more open shells and/or unsewn faces in the left model match one solid in the right model
	Unsewn Shell	One open shell in the left model matches one or more open shells and/or unsewn faces in the right model
	Unsewn Solid	One solid in the left model matches one or more open shells and/or unsewn faces in the right model
	Complex Entity Match	Matching top-level entities are a combination of solids, open shells and/or unsewn faces in each model
	Complex Solid Match	Two or more solids in the left model match two or more solids in the right model
	Different Model Area	Total area of the models is significantly different

Level	Diagnostic	Brief Description
<b>Property Changes</b>	Different Model Location	Centroid location of the models is significantly different
	Different Model Volume	Total solid volume of the models is significantly different
	Different Solid Area	Matching solids have a significant area difference
	Different Solid Location	Matching solids have a significant centroid location difference
	Different Solid Volume	Matching solids have a significant volume difference
	Different Shell Area	Matching shells have a significant area difference
	Different Face Area	Matching faces have a significant area difference
	Different Face Color	Matching faces have a significant color difference
	<b>Different Feature Parameter</b>	<b>Matching features have a different parameter value</b>
<b>Different Annotation Curve Length</b>	<b>Matching PMI annotations have a significant curve length difference</b>	
<b>Topology Changes</b>	Collapsed Face	Narrow face in the left model has no matching face in the right model
	Inserted Face	Narrow face in the right model has no matching face in the left model
	Complex Face Match	Two or more faces in the left model match two or more faces in the right model
	Merged Face	Two or more faces in the left model match one face in the right model
	Split Faces	One face in the left model matches two or more faces in the right model
<b>STEP Validation Properties</b>	Model ValProp Area	Adds a geometric validation property to a STEP file that captures the total area of the native model
	Model ValProp Location	Adds a geometric validation property to a STEP file that captures the centroid of the native model
	Model ValProp Volume	Adds a geometric validation property to a STEP file that captures the total volume of the native model
	Solid ValProp Area	Adds a geometric validation property to a solid in a STEP model that captures the area of the matching solid in the native model
	Solid ValProp Location	Adds a geometric validation property to a solid in a STEP model that captures the centroid of the matching solid in the native model
	Solid ValProp Volume	Adds a geometric validation property to a solid in a STEP model that captures the volume of the matching solid in the native model
	Shell ValProp Area	Adds a geometric validation property to an open shell in a STEP model that captures the area of the matching open shell in the native model
	Face ValProp Points	Adds geometric validation properties to a face in a STEP model that capture the sampling points from the matching face in the native model
	Face ValProp Area	Adds a geometric validation property to an unsewn face in a STEP model that captures the area of the matching unsewn face in the native model