

Key Features	CADIQ compares CAD models of multiple 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 six sigma quality improvement. All functionality is available in a command line interface for integration into PLM systems.
New Features	Automated assembly analysis for Unigraphics NX and SolidWorks Diagnostic view and markup (custom views) Comparison of parts defined in different coordinate systems CATIA V4 mock-up solid analysis and comparison Pro/E family table analysis and comparison New quality and comparison diagnostics Updated CAD system release support
Module	Description
Embedded Launcher	An embedded CAD 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. Also simplifies the process of executing a Copy Viewpoint macro created by the Viewer.
Controller	User interface for creating batch analysis jobs, monitoring their progress in real-time, generating the analysis statistics, and loading model diagnostic results into the Viewer.
Analyzer	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.
Viewer	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 configured to behave like any supported CAD system and a macro can be dynamically created to orient the CAD system's graphics to be consistent with the Viewer's.
Qualify Application	Subset of Analyzer diagnostics that identify topology and geometry defects that impede downstream tooling, exchange, simulation or design reuse processes.
Compare Application	Subset of Analyzer diagnostics that identify form, property, topology and shape differences between two equivalent models.
STEP Validation Properties	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.
CAD System Interface	Dynamic query interface between the Analyzer and a batch CAD session through its application programming interface (API). No data translation or conversion occurs before the model is analyzed and the model is not changed by the analysis process. Requires a CAD system runtime license.

CAD System or Format			Operating System						
			AIX		HP-UX	SunOS		Windows	
Name	API	Version	5.2	5.3	11.11	5.8	5.10	NT/XP	XP x64
CADDS 5i	CV-DORS	14			5.1	5.1		5.1	5.1
CATIA V4 (1)	CATGEO	4.2.4	5.1	5.1	5.1	5.1	5.1	n/a	n/a
CATIA V5 (1) (2)	ABC-CAA	v5r15				5.1	5.1	5.1	
		v5r16			5.1	5.1	5.1	5.1	
		v5r17			5.1		5.1	5.1	5.1
		v5r18						5.1	5.1
I-deas (1)	Open I-DEAS	11						5.1	
		12			5.1	5.1	5.1	5.1	
		NXI5							5.1
Pro/ENGINEER (1)	Pro/TOOLKIT	WF 2	n/a	n/a			*	5.1	
		WF 3	n/a	n/a				5.1	5.1
SolidWorks (1)	Parasolid	2008	n/a	n/a	n/a	n/a	n/a	5.1	5.1
Unigraphics (1) (3)	NX Open	NX 3			*			5.1	
		NX 4						5.1	5.1
		NX 5						5.1	
Parasolid	Parasolid	18.1				5.1		5.1	5.1
IGES	PDElib	5.3			*	*		5.1	5.1
STEP	PDElib	Any AP			5.1	5.1		5.1	5.1
Prerequisites									
(1)	The CATIA V4, CATIA V5, I-deas, Pro/ENGINEER, SolidWorks and Unigraphics 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 Unigraphics interface also requires one NX Open C/C++ API license per CADIQ installation (for any number of concurrent CADIQ sessions).								
Legend									
Bold font	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								
Released Configurations:			46						

Level	Diagnostic	Brief Description
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	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
Exchange Defects	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	

Level	Diagnostic	Brief Description
Simulation Defects	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	
Design Information	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

Level	Diagnostic	Brief Description
Shape Changes	Shifted Faces	Matching faces have a major shape change
	Shifted Edges	Matching sharp edges have a major shape change
	Unmatched Solid	Solid in the right-hand model does not have a matching solid in the left-hand model
	Unmatched Shell	Shell in the right-hand model does not have a matching shell in the left-hand model
	Unmatched Faces	Set of connected faces in the right-hand model have no matching faces in the left-hand model
	Unmatched External Solid	Solid in the left-hand (external) model does not have a matching solid in the right-hand model
	Unmatched External Shell	Shell in the left-hand (external) model does not have a matching shell in the right-hand model
	Unmatched External Faces	Set of connected faces in the left-hand (external) model have no matching faces in the right-hand model
Shape Deviations	Deviant Faces	Matching faces have a significant shape deviation
	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-hand model match one open shell in the right-hand model
	Sewn Solid	One or more open shells and/or unsewn faces in the left-hand model match one solid in the right-hand model
	Unsewn Shell	One open shell in the left-hand model matches one or more open shells and/or unsewn faces in the right-hand model
	Unsewn Solid	One solid in the left-hand model matches one or more open shells and/or unsewn faces in the right-hand model
	Complex Entity Match	Matching top-level entities are a combination of solids, open shells and/or unsewn faces in each model
Property Changes	Different Model Area	Total area of the models is significantly different
	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
Topology Changes	Collapsed Face	Narrow face in the left-hand model has no matching face in the right-hand model
	Inserted Face	Narrow face in the right-hand model has no matching face in the left-hand model
	Complex Face Match	Two or more faces in the left-hand model match two or more faces in the right-hand model
	Merged Face	Two or more faces in the left-hand model match one face in the right-hand model
	Split Faces	One face in the left-hand model matches two or more faces in the right-hand model

Level	Diagnostic	Brief Description
STEP Validation Properties	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