

PDQ Validation and Repair Plug-in for NX

CADdoctor[®] *for* NX

CADdoctor for NX

User's Manual

January 2023
Elysium Co. Ltd.

Index

1. Starting and Exiting CADdoctor for NX	1
1.1. Starting the CADdoctor for NX	1
1.1.1. How to Start	1
1.2. Exiting the CADdoctor for NX	3
1.2.1. Normal Exit	3
1.2.2. Terminating the CADdoctor for NX	3
2. License Setting	4
2.1. Procedure of License Setting	4
3. Diagnosing Parts	5
3.1. Diagnosing Parts	5
3.1.1. Select Parts to Diagnose	5
3.1.2. Select CADdoctor for NX Checker	6
3.1.3. Specify Customization	7
3.1.4. Specify Execution Options	10
3.1.5. Execute Diagnostics	11
3.2. Checking Error Positions	12
3.2.1. Identifying Error Elements with Highlighting	12
3.2.2. Count of Elements Affected by Errors	18
3.2.3. Maximum Number of Displayed Elements Affected by Errors	18
3.2.4. Maximum Number of Error Positions	19
3.2.5. Faces Not Checked	19
3.2.6. Identifying Exact Error Positions Using Reference Points	20
3.2.7. Operations with Groups of Reference Points	20
4. Healing	21
4.1. Healing Parts	21
4.1.1. Select Parts to Heal	21
4.1.2. Select CADdoctor for NX Healer	22
4.1.3. Specify Customization	23
4.1.4. Specify Execution Options	25
4.1.5. Execute Healing	26
4.2. Heal Error Elements Only	27
4.2.1. Select the Parts to Heal	27
4.2.2. Run [CADdoctor for NX Checker]	28

4.2.3. Select CADdoctor for NX Partial Healer	29
4.2.4. Specify Customization	30
4.2.5. Specify Execution Options	32
4.2.6. Execute Healing	33
5. Checking Results	35
5.1. Checking Detailed Results	35
5.2. Checking Results Flags	35
6. Import and Export ENF	36
6.1. Export ENF	36
6.2. Import ENF	38
7. Clean Up Files	40
7.1. Clean Up Disused Files	40
8. Utilities	41
8.1. CSV Log Files	41
8.1.1. CSV Log Files for PDQ Diagnostic Results (JOBID_user name_PDQ.csv) ..	41
8.1.2. CSV Log Files for PDQ Healing Results (JOBID_user name_heal.csv)	42
Appendix A: Check Items	43
A.1. Check Items List	43
A.1.1. Check Items List	45
Appendix B: Notes on Results Flag	51
B.1. Description of Results Flag	51
B.2. Validity of Results Flag	51
Appendix C: Notes	52
C.1. Diagnostics of Parts under Assemblies	52
C.2. Free Space of the Drive Specified as the Temporary Folder	52
C.3. Deleting Disused Files	52
Appendix D: Glossary	53
D.1. Check Item Terms	53
Appendix E: Troubleshooting	54

1. Starting and Exiting CADdoctor for NX

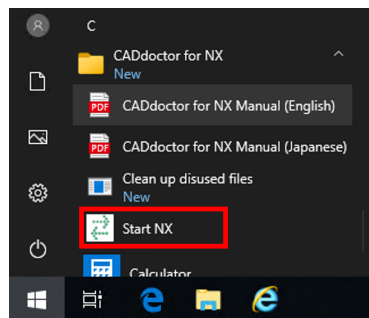
1.1. Starting the CADdoctor for NX

For general Check-Mate operating instructions, please refer to the Check-Mate manual provided with NX.

1.1.1. How to Start

Start the program as follows:

1. Startup NX from the menu [Start] > [CADdoctor for NX] > [Start NX].

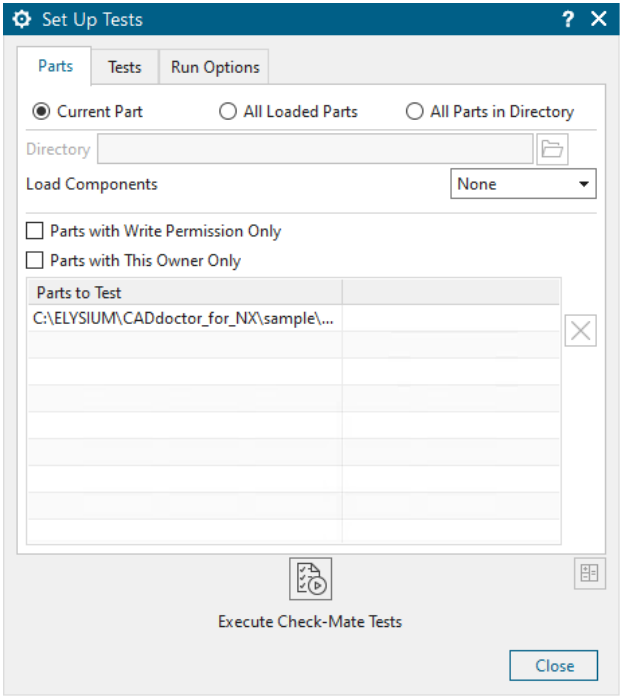


2. Import the file(s) to diagnose.
3. To start Check-Mate, click [Set Up Tests] () on the NX toolbar (or select [Analysis] > [Check-Mate] > [Set Up Tests] from the menu). (If the Check-Mate button does not appear on the toolbar, right-click the toolbar and select [Check-Mate])

Or run the following command manually from HD3D tool () at the left of NX user interface.

[Check-Mate] > [Settings] > [Set Up Tests]

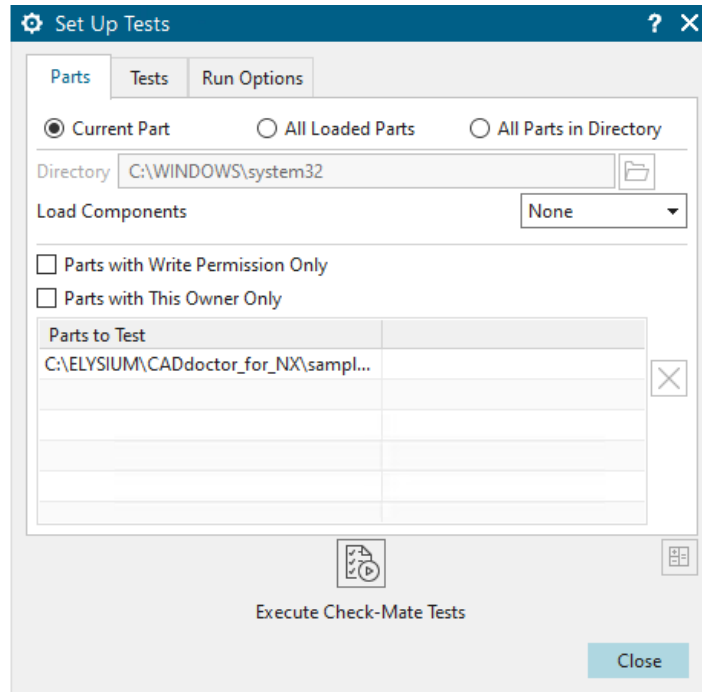
The following "Set Up Tests" dialog will appear. Use this dialog to perform parts diagnostics.



1.2. Exiting the CADdoctor for NX

1.2.1. Normal Exit

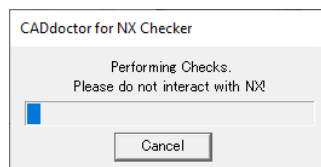
To exit CADdoctor for NX (Check-Mate), click [Close] in "Set Up Tests" dialog.



1.2.2. Terminating the CADdoctor for NX

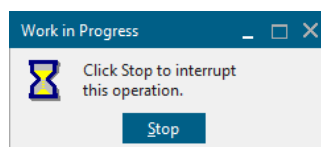
Halting diagnostics of the current part

If necessary, you can halt diagnostics of the current part by clicking [Cancel] on the following progress indicator displayed by CADdoctor for NX. If you are diagnosing multiple parts at once, diagnostics will resume from the part after the canceled part.



Aborting the session

If necessary, you can terminate the Check-Mate session by clicking [Stop] on the following progress indicator displayed by NX. If you are diagnosing multiple parts at once, the moment [Stop] is clicked, the entire Check-mate session will end after the current part has been diagnosed.



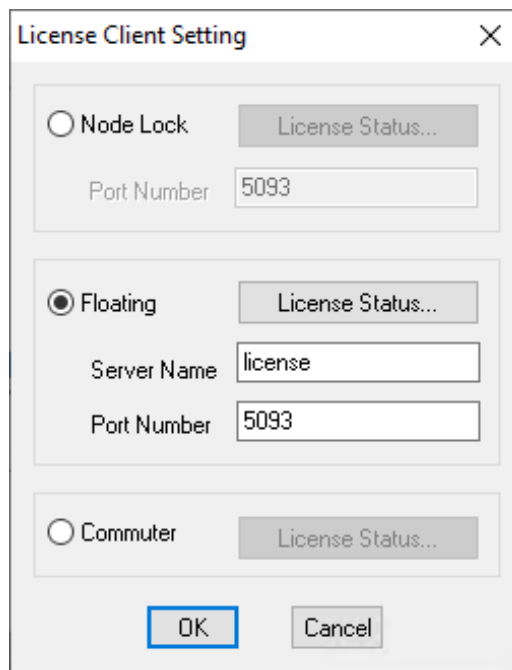
2. License Setting

2.1. Procedure of License Setting

Select [CADdoctor for NX Tools] tab > [Set Elysium License] from the ribbon menu, and "License Client Setting" dialog will appear.

Please refer to the separate volume "Sentinel RMS License Manager Setup & Quick Start Guide" for details on how to set the license password and how to install the "Elysium License Management Program".

- For Floating license, make sure that the following items are set in the [License Client Setting] dialog (Floating).
 - [Server Name]
The computer name (host name) where the license server is installed
 - [Port Number]
The port number of the license server (Default is "5093")

The image shows a "License Client Setting" dialog box with a close button (X) in the top right corner. It contains three radio button options: "Node Lock", "Floating", and "Commuter". Each option has a "License Status..." button next to it. The "Floating" option is selected. Under "Node Lock", there is a "Port Number" field with the value "5093". Under "Floating", there are "Server Name" and "Port Number" fields, both containing the value "license". Under "Commuter", there is a "Port Number" field with the value "5093". At the bottom, there are "OK" and "Cancel" buttons. The "OK" button is highlighted with a blue border.

- In addition, you can use Node Lock (the client computer is fixed). Check "Node Lock" and specify the license password file in this case.
- Also, you can use Commuter (the client license is taken out). Check "Commuter".



Try setting the license again according to the separate volume "Sentinel RMS License Manager Setup & Quick Start Guide" if the above are not set correctly.

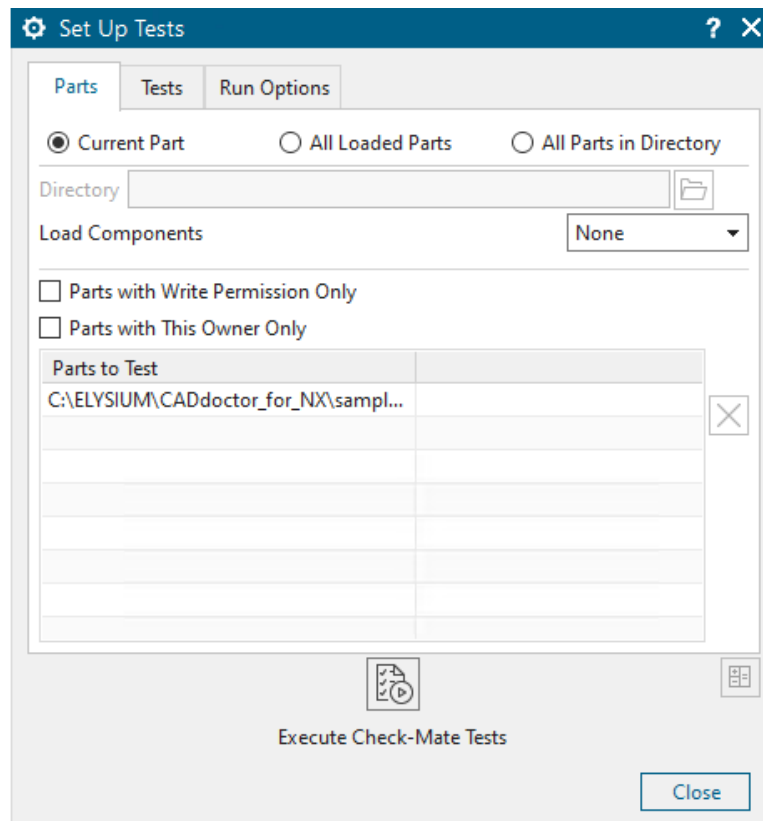
3. Diagnosing Parts

3.1. Diagnosing Parts

3.1.1. Select Parts to Diagnose

Click [Parts] tab in "Set Up Tests" dialog, and select one of the following items:

- [Current Part]
To diagnose the part currently shown in the graphics window.
- [All Loaded Parts]
To diagnose all parts currently loaded in NX.
- [All Parts in Directory]
To diagnose all part files in the selected folder.



There are two ways to specify an assembly model as the target:

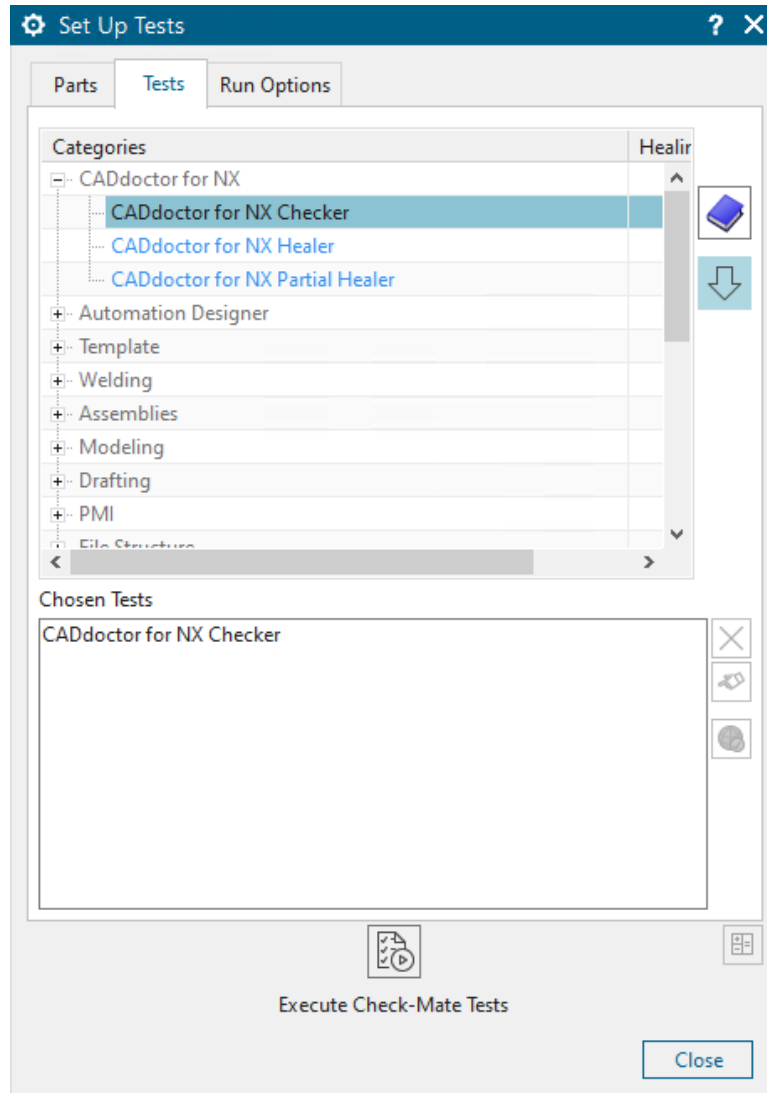
- Open all the parts that constitute an assembly and select "All Loaded Parts"
- Open top part of an assembly and select "All Levels" of Load Components.

3.1.2. Select CADdoctor for NX Checker

After clicking [Tests] tab, add "CADdoctor for NX Checker" from "Categories" to "Chosen Tests".



With "CADdoctor for NX Checker" selected in "Categories", click [Add] () or double-click "CADdoctor for NX Checker" to add it for testing.

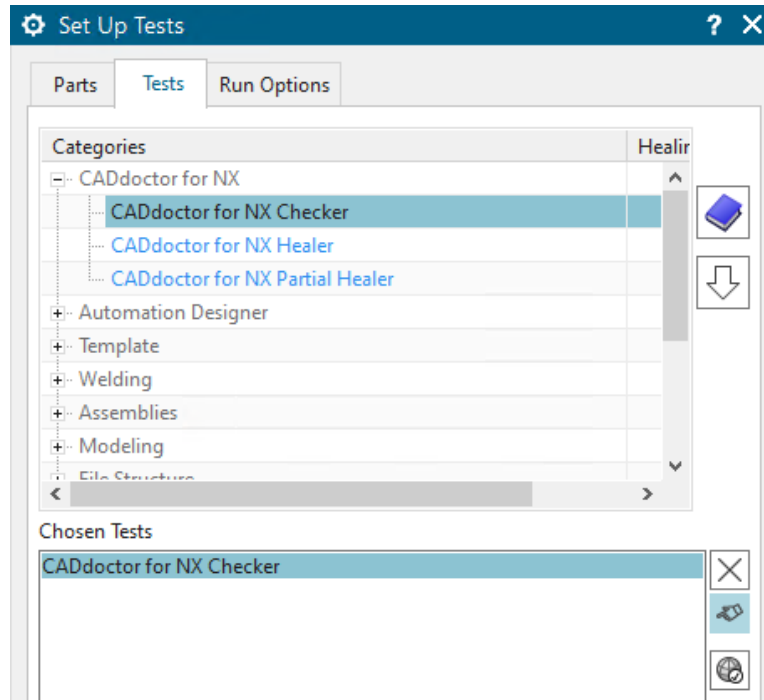


3.1.3. Specify Customization

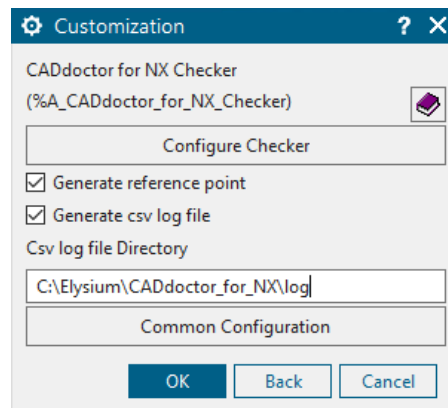


Optional. Customize the settings only if you want to change the default settings.

After clicking [Tests] tab, select "CADdoctor for NX Checker" in "Chosen Tests" and click [Customize] ().

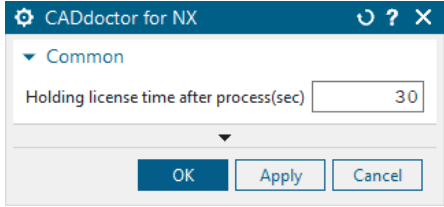


The following [Customization] dialog will appear.

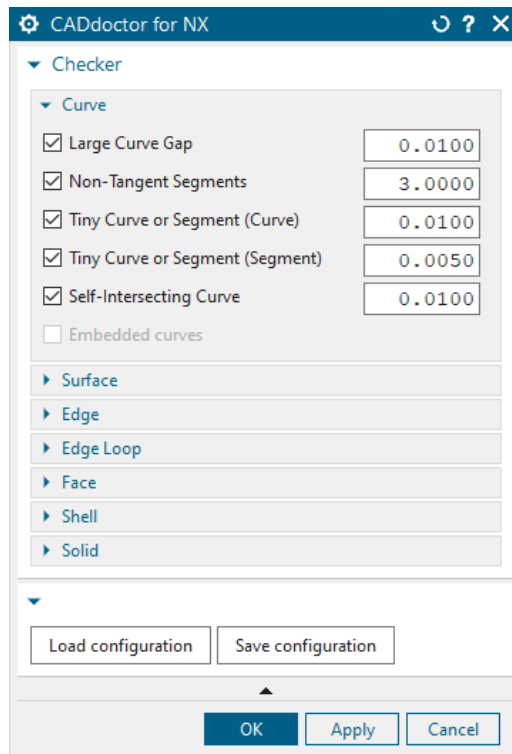


The following options can be configured in [Customization] dialog.

Option	Details
Configure Checker	Set validation items and thresholds.
Generate reference point	Generate reference points in the NX model to identify the exact positions of errors.

Option	Details
Generate csv log file	Export files for checking results in CSV format. Files are created in the specified folder with the filename [year (last two digits)] [month] [day] [hour] [minute] [second]_user name_PDQ.csv.
Csv log file Directory	Indicate the folder in which you want to save results files in CSV format. (This selection is valid only if you select [Generate csv log file] option) Note: Folder names that include Japanese characters cannot be selected.
Common Configuration	Set common configuration of Checker and Healer. Click [Common Configuration] and the following dialog will appear.  Holding license time after process(sec) : If saving each part takes long, specify a larger value. Default value is 30.

Click [Configure Checker] and the following dialog will appear.



- Grayed out items will be available in the future.
- If you uncheck even one of the items, the validation result of the part is treated as skipped even if all the other validation items pass.
- Click [Save configuration] to save the settings of check items to the configuration file (*.ndr). Click [Load configuration] and select a configuration file (*.ndr) to load the saved settings.
- Load the following file to restore the default settings of standard Checker.
 - <CADdoctor for NX installation folder>\config\default.ndr

3.1.4. Specify Execution Options



Optional. Customize the settings only if you want to change the default settings.

After clicking [Run Options] tab, from the pull-down menu of "Save Part After Checking", select "Save if Passed". Enable "Generate Check Flag" and "Treat Warning as Pass".

These settings will allow a flag to be added to the model which has passed all Standard Criteria.

To save [Run Options] settings, save the settings on [Run Options] tab by clicking the NX [File] menu and selecting [Utilities] > [Custom Defaults] > [Analysis] > [Check-Mate].

If you have selected [All Parts in Directory] on [Parts] tab, the reference points will not be saved if errors are detected. If you need reference points, in the pull-down menu of "Save Part After Checking" list, select [Always Save].



Set Up Tests

Parts Tests **Run Options**

☐ Stop on an Error
☐ Stop on a Warning

Save Part After Checking: Always Save

Smart Check Options

☒ Generate Check Flag ☒ Treat Warning as Pass
☐ Skip Checking if Check Flag is Up-to-date
☐ Read Flag without Part Loading

☐ Generate an External Log File One log per session

Save Results to Log File in
 Directory: C:\ELYSIUM\CADdoctor_for_NX\log\

☐ Publish Results to Quality Dashboard

Display Results Options

Always Display
☒ Automatically Update Results when Work Part Changed

Execute Check-Mate Tests

Close

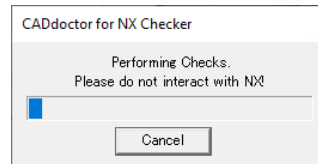
3.1.5. Execute Diagnostics

Click [Execute Check-Mate Tests] () to start diagnostics.

A progress indicator will appear after diagnostics begins. To cancel diagnostics currently underway, click [Cancel].



Do not perform NX operations during diagnostics.



When processing is complete, the Check-Mate results dialog will appear. The results are listed under [Results]. Please refer to "Checking Error Positions" for detail on how to investigate errors.

HD3D Tools			
Check-Mate			
Results			
View Style			
Tree			
Object Name	Count	Profile	Result
☒ Large Curve Gap		CADdoctor for NX Checker	Passed
☒ Non-Tangent Segments		CADdoctor for NX Checker	Passed
☒ Tiny Curve or Segment (Curve)		CADdoctor for NX Checker	Passed
☒ Tiny Curve or Segment (Segment)		CADdoctor for NX Checker	Passed
☒ Self-Intersecting Curve	4	CADdoctor for NX Checker	Failed
☒ Non-Tangent Patches		CADdoctor for NX Checker	Passed
☒ Tiny Surface or Patch (Surface)		CADdoctor for NX Checker	Passed
☒ Narrow Surface or Patch (Surface)		CADdoctor for NX Checker	Passed
☒ Narrow Surface or Patch (Patch)		CADdoctor for NX Checker	Passed
☒ Degenerate Surface Boundary (Surface)		CADdoctor for NX Checker	Passed
☒ Self-Intersecting Surface	6	CADdoctor for NX Checker	Failed
☒ Degenerate Surface Corner		CADdoctor for NX Checker	Passed
☒ Self-Intersecting Loop	16	CADdoctor for NX Checker	Failed
☒ Inconsistent Edge In Loop		CADdoctor for NX Checker	Passed
☒ Large Edge Face Gap		CADdoctor for NX Checker	Passed
☒ Tiny Face		CADdoctor for NX Checker	Passed
☒ Narrow Face		CADdoctor for NX Checker	Passed
☒ Large Vertex Gap		CADdoctor for NX Checker	Passed
☒ Intersecting Loops		CADdoctor for NX Checker	Passed
☒ Large Face Gap		CADdoctor for NX Checker	Passed
☒ Over-Used Edge		CADdoctor for NX Checker	Passed

3.2. Checking Error Positions

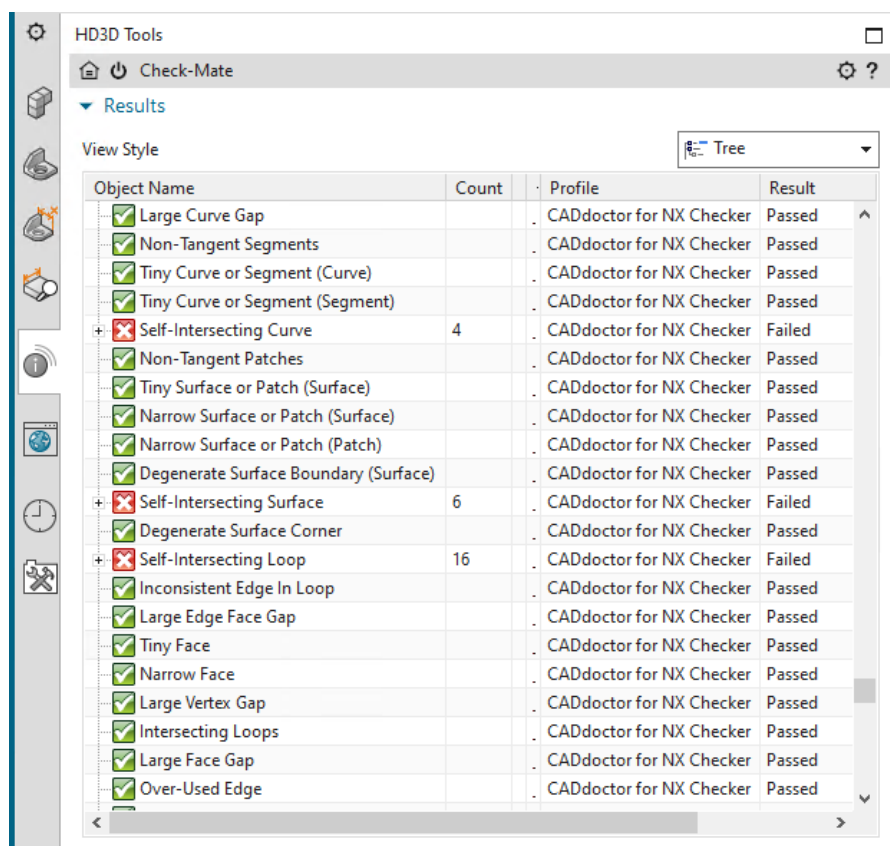
For general Check-Mate operating instructions, refer to the Check-Mate manual provided with NX.



Generating reference points requires selecting the corresponding option in the settings. Please refer to [3.1.3, “Specify Customization”](#) for more details.

3.2.1. Identifying Error Elements with Highlighting

The Check-Mate results dialog will appear when diagnostics has been completed, and the results are listed under [Results].



The meaning of each icon is as follows:

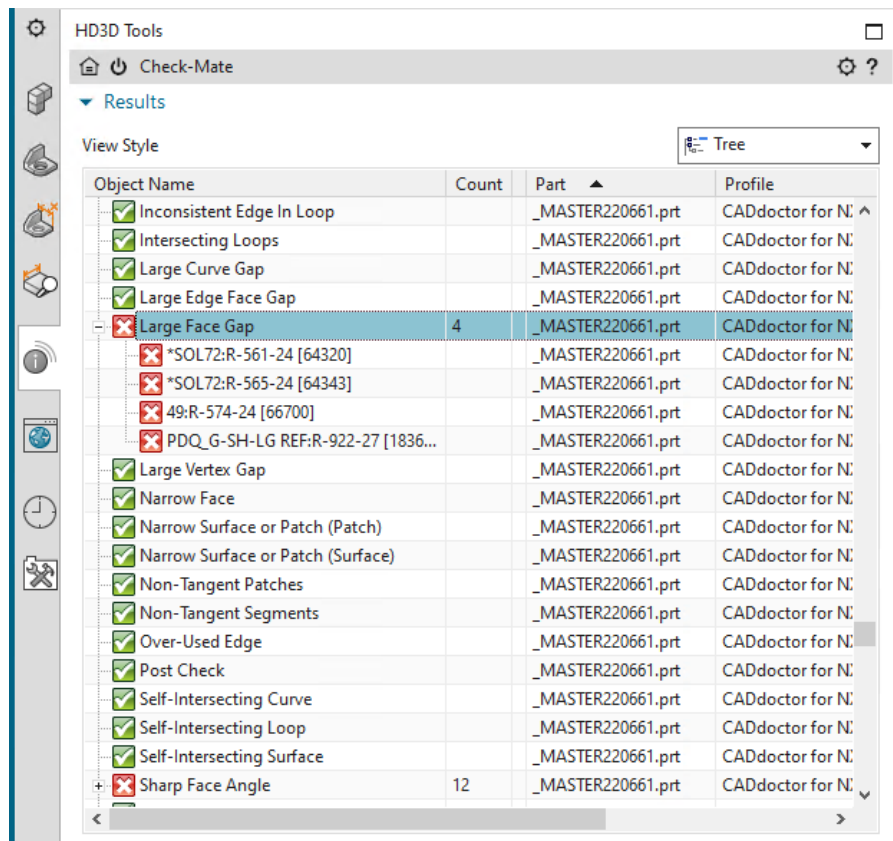
- ☒ Show Passed
- ☒ Show Passed with Information
- ☒ Show Passed with Warning
- ☒ Show Failed
- ☒ Show Skipped

Skip () icon is displayed for items that are unchecked in [Configure Checker].

Fail () icon is displayed for items where an error has been detected.

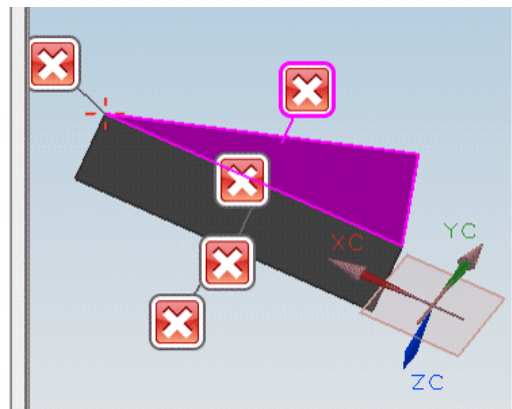
Expanding the tree node for these items show related elements at the position of the error. (The following figure is an example of elements related to the position at which an error

occurred involving Large Face Gap - specifically, face, points (reference points described later), and an edge.)

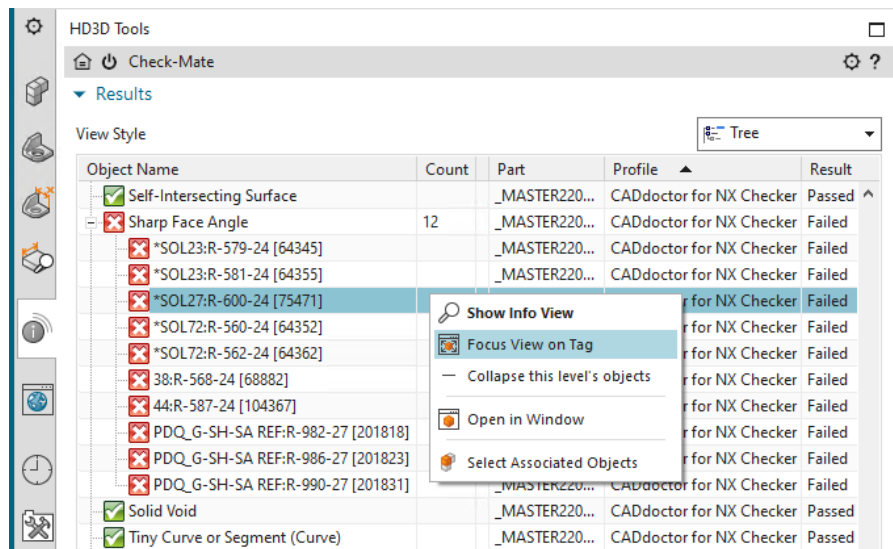


When selecting an element in the tree, the corresponding element will be highlighted on the NX graphics window.

Object Name	Count	Part	Profile
✓ Over-Used Edge		_MASTER220661.prt	CADdoctor for N: ^
✓ Post Check		_MASTER220661.prt	CADdoctor for N:
✓ Self-Intersecting Curve		_MASTER220661.prt	CADdoctor for N:
✓ Self-Intersecting Loop		_MASTER220661.prt	CADdoctor for N:
✓ Self-Intersecting Surface		_MASTER220661.prt	CADdoctor for N:
✗ Sharp Face Angle	12	_MASTER220661.prt	CADdoctor for N:
✗ *SOL27:R-600-24 [75471]		_MASTER220661.prt	CADdoctor for N:
✗ PDQ_G-SH-SA REF:R-982-27 [2018...		_MASTER220661.prt	CADdoctor for N:
✗ 44:R-587-24 [104367]		_MASTER220661.prt	CADdoctor for N:
✗ *SOL23:R-579-24 [64345]		_MASTER220661.prt	CADdoctor for N:
✗ *SOL23:R-581-24 [64355]		_MASTER220661.prt	CADdoctor for N:
✗ PDQ_G-SH-SA REF:R-986-27 [2018...		_MASTER220661.prt	CADdoctor for N:
✗ 38:R-568-24 [68882]		_MASTER220661.prt	CADdoctor for N:
✗ *SOL72:R-560-24 [64352]		_MASTER220661.prt	CADdoctor for N:



You can easily see the target element on the graphic window by right-clicking with the element selected, and select "Focus View on Tag" from the context menu.



When there are multiple related elements at the error position, double-click the error to show information for the group in [Check-Mate Result]. (The following figure is an example of two sets of reference points indicating the position of gaps between edges of each error position for "Large Curve Gap" error. The indices "Index: 1" and "Index: 2" are shown at each error position.)



"Edge - Index: 1 / 2" indicates that a total of two edges with gaps were detected and that this information applies to the first edge. Next, the width of the gap between the first set of edges shows "0.010239 [mm]". A reference point is generated at this position, and Index: 1 (the same as the edge) is assigned to it.

The following elements are highlighted for each diagnosed item:

No .	Problem Category	Highlighted Element	Position of Added Reference Points	Group Name of Reference Points	Label
1	Large Curve Gap	2 corresponding edges and 1 reference point	Vertex position between two edges	PDQ_G-CG-LG	
2	Non-Tangent Segments	1 corresponding edge and 1 reference point	Position at which the curve segment is broken (*1)	PDQ_G-CU-NT	
3	Tiny Curve or Segment (Curve)	1 corresponding edge	N/A	N/A	N/A
4	Tiny Curve or Segment (Segment)	1 corresponding edge and 1 reference point	Tiny segment position (starting position)	PDQ_G-ED-TI GEO	
5	Self-Intersecting Curve	1 corresponding edge and 1 reference point	Position at which a curve segment intersects itself (*2)	PDQ_G-CU-IS	
6	Non-Tangent Patches	1 corresponding face and 1 reference point	Position at which the surface is broken. If the surface is broken in either the U or V direction, the isocurve starting point. If broken in both directions, the position of the isocurve intersection. (*1)	PDQ_G-SU-NT	
7	Tiny Surface or Patch (Surface)	1 corresponding face	N/A	N/A	N/A
8	Narrow Surface or Patch (Surface)	1 corresponding face	N/A	N/A	N/A
9	Narrow Surface or Patch (Patch)	1 corresponding face and 1 reference point	Parameter (0.5, 0.5) position of corresponding face	PDQ_G-SU-NA_2	

No .	Problem Category	Highlighted Element	Position of Added Reference Points	Group Name of Reference Points	Label
10	Degenerate Surface Boundary (Surface)	1 corresponding face and 1 reference point	Position at which a surface degenerates	PDQ_G-SU-DC_1	
11	Self-Intersecting Surface	1 corresponding face and 1 reference point	Position at which a surface intersects itself (*2)	PDQ_G-SU-IS	
12	Degenerate Surface Corner	1 corresponding face and 1 reference point	Corner of corresponding surface	PDQ_G-SU-DP	
13	Self-Intersecting Loop	1 corresponding face, 2 edges, and 1 or no reference points	Position at which an edge loop intersects itself	PDQ_G-LO-IS	
14	Inconsistent Edge In Loop	1 corresponding face and 1 reference point	0.5 position on curve segment parameter	PDQ_G-LO-IT	
15	Large Edge Face Gap	1 corresponding edge, 1 face, and 1 reference point	Position on edge with the greatest gap between the base surface and edge	PDQ_G-FA-EG	
16	Tiny Face	1 corresponding face	N/A	N/A	N/A
17	Narrow Face	1 corresponding face	N/A	N/A	N/A
18	Large Vertex Gap	1 corresponding face and 1 reference point	Vertex position	PDQ_G-FA-VG	
19	Intersecting Loops	1 corresponding face, 2 corresponding edges, and 1 or no reference points	Position at which 2 loops intersect	PDQ_G-FA-IS_2	

No .	Problem Category	Highlighted Element	Position of Added Reference Points	Group Name of Reference Points	Label
20	Large Face Gap	2 corresponding faces, 1 edge where there is a gap, and 1 reference point	Position on edge with the greatest gap between two faces	PDQ_G-SH-LG	
21	Over-Used Edge	1 corresponding edge	N/A	N/A	N/A
22	Sharp Face Angle	2 corresponding faces, 1 corresponding edge, and 1 reference point	Position on edge with a sharp angle between two faces	PDQ_G-SH-SA	
23	Tiny Solid	1 corresponding solid	N/A	N/A	N/A
24	Solid Void	1 corresponding solid and 1 corresponding face	N/A	N/A	N/A
25	Embedded Faces	2 corresponding faces	N/A	N/A	N/A
26	Free Edge	1 corresponding edge	N/A	N/A	N/A

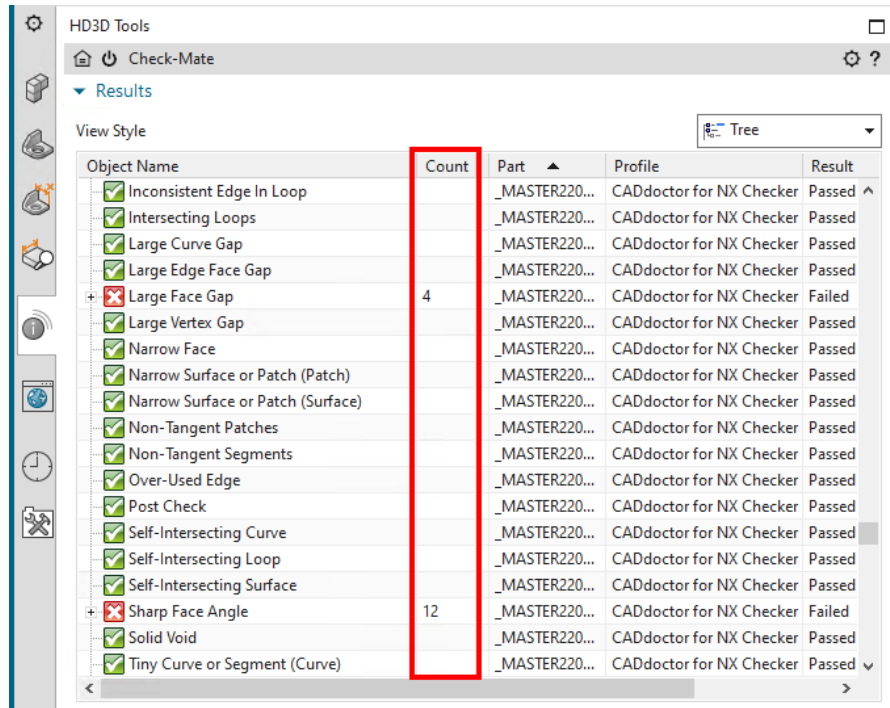
(*1) If there are multiple breaks, only the first detected position is highlighted.

(*2) If there are multiple self-intersections, only the first detected position is highlighted.

(*3) If there are multiple gaps, only the first detected position is highlighted.

3.2.2. Count of Elements Affected by Errors

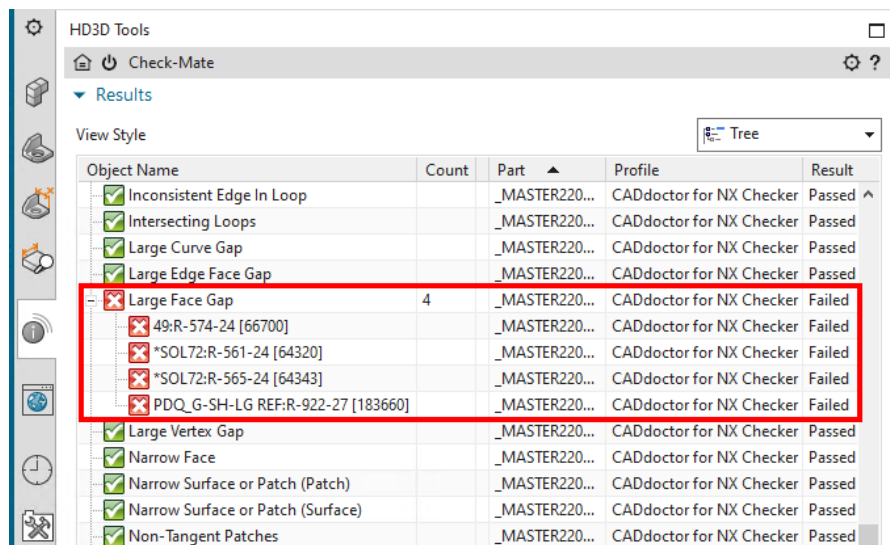
The number displayed in "Count" column next to each diagnostic items in [Results] tree is not the number of errors, but the total number of related elements included in each item (= number of related elements per error position × number of error positions).



Object Name	Count	Part	Profile	Result
Inconsistent Edge In Loop		_MASTER220...	CADdoctor for NX Checker	Passed
Intersecting Loops		_MASTER220...	CADdoctor for NX Checker	Passed
Large Curve Gap		_MASTER220...	CADdoctor for NX Checker	Passed
Large Edge Face Gap		_MASTER220...	CADdoctor for NX Checker	Passed
Large Face Gap	4	_MASTER220...	CADdoctor for NX Checker	Failed
Large Vertex Gap		_MASTER220...	CADdoctor for NX Checker	Passed
Narrow Face		_MASTER220...	CADdoctor for NX Checker	Passed
Narrow Surface or Patch (Patch)		_MASTER220...	CADdoctor for NX Checker	Passed
Narrow Surface or Patch (Surface)		_MASTER220...	CADdoctor for NX Checker	Passed
Non-Tangent Patches		_MASTER220...	CADdoctor for NX Checker	Passed
Non-Tangent Segments		_MASTER220...	CADdoctor for NX Checker	Passed
Over-Used Edge		_MASTER220...	CADdoctor for NX Checker	Passed
Post Check		_MASTER220...	CADdoctor for NX Checker	Passed
Self-Intersecting Curve		_MASTER220...	CADdoctor for NX Checker	Passed
Self-Intersecting Loop		_MASTER220...	CADdoctor for NX Checker	Passed
Self-Intersecting Surface		_MASTER220...	CADdoctor for NX Checker	Passed
Sharp Face Angle	12	_MASTER220...	CADdoctor for NX Checker	Failed
Solid Void		_MASTER220...	CADdoctor for NX Checker	Passed
Tiny Curve or Segment (Curve)		_MASTER220...	CADdoctor for NX Checker	Passed

3.2.3. Maximum Number of Displayed Elements Affected by Errors

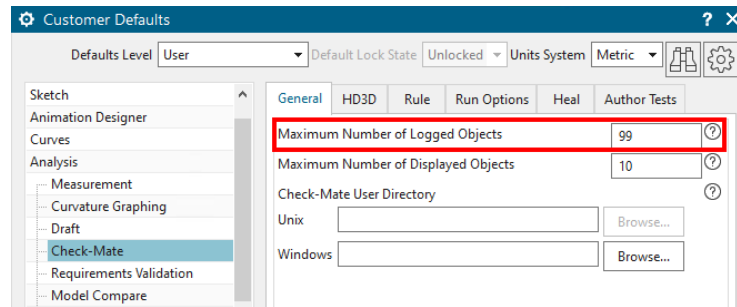
By default, the number of related elements shown for each diagnostic item in the [Results] tree of the dialog is limited according to Check-Mate specifications.



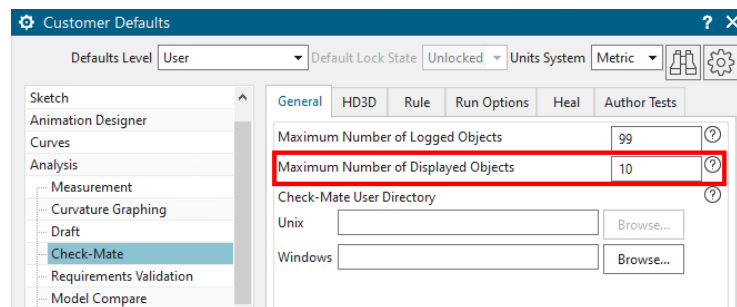
Object Name	Count	Part	Profile	Result
Inconsistent Edge In Loop		_MASTER220...	CADdoctor for NX Checker	Passed
Intersecting Loops		_MASTER220...	CADdoctor for NX Checker	Passed
Large Curve Gap		_MASTER220...	CADdoctor for NX Checker	Passed
Large Edge Face Gap		_MASTER220...	CADdoctor for NX Checker	Passed
Large Face Gap	4	_MASTER220...	CADdoctor for NX Checker	Failed
49:R-574-24 [66700]		_MASTER220...	CADdoctor for NX Checker	Failed
*SOL72:R-561-24 [64320]		_MASTER220...	CADdoctor for NX Checker	Failed
*SOL72:R-565-24 [64343]		_MASTER220...	CADdoctor for NX Checker	Failed
PDQ_G-SH-LG REF:R-922-27 [183660]		_MASTER220...	CADdoctor for NX Checker	Failed
Large Vertex Gap		_MASTER220...	CADdoctor for NX Checker	Passed
Narrow Face		_MASTER220...	CADdoctor for NX Checker	Passed
Narrow Surface or Patch (Patch)		_MASTER220...	CADdoctor for NX Checker	Passed
Narrow Surface or Patch (Surface)		_MASTER220...	CADdoctor for NX Checker	Passed
Non-Tangent Patches		_MASTER220...	CADdoctor for NX Checker	Passed

To change the maximum number of displayed objects, change the values of both [Maximum Number of Logged Objects] and [Maximum Number of Displayed Objects] by starting from NX menu, select [File] > [Utilities] > [Customer Defaults] > [Analysis] > [Check-Mate].

- Change the value of "Maximum Number of Logged Objects" in [General] tab.



- Change the value of "Maximum Number of Displayed Objects" in [General] tab.



By setting these two values above, the maximum number of displayed objects are modified.

3.2.4. Maximum Number of Error Positions

By default, Check-Mate stores up to 2,000 positions at which errors are detected. If errors are detected at more than 2,000 position, a warning is issued as part of the post-check results, and the total number of errors are shown.

3.2.5. Faces Not Checked

Faces and edges may not be checked if they do not have the geometry information. This causes a failure in "Post Check," and the error elements and reference points for the error elements will be listed in the result dialog.

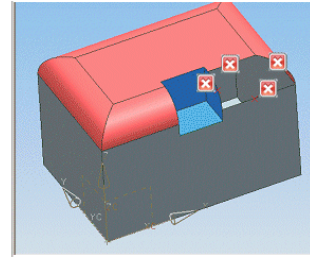
Reference points will be created based on the following rules:

- For faces without geometry information
Reference points named "POINT_ON_EXTRACT_FAIL_FACE" will be created at the midpoint of all the edges of the face.
- For edges without geometry information
Reference points named "POINT_ON_EXTRACT_FAIL_EDGE" will be created at both end points of the edge.

Faces may not be highlighted if they lack geometry, etc.



✓ Solid Void		CADdoctor for NX Checker	Passed
✗ Post Check	8	CADdoctor for NX Checker	Failed
✗ Face:R-4309-1 [180724]		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-864...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-865...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-865...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-866...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-866...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-866...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-867...		CADdoctor for NX Checker	Failed
✗ POINT_ON_EXTRACT_FAIL_FACE:R-867...		CADdoctor for NX Checker	Failed
✓ Embedded Faces		CADdoctor for NX Checker	Passed
+ Free Edge	211	CADdoctor for NX Checker	Passed with



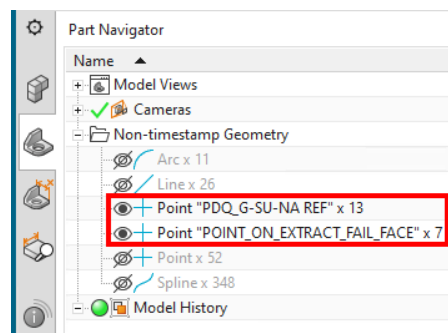
3.2.6. Identifying Exact Error Positions Using Reference Points

CADdoctor for NX Checker generates reference points in NX models to indicate the exact position where the errors occurred. Since these reference points appear as error-related elements in the [Results] tree of the Check-Mate dialog, you can highlight them in Check-Mate or use the panning function to identify the exact error position.

For detailed information on positions at which reference points are generated, types of labels, and so on, refer to the table above.

3.2.7. Operations with Groups of Reference Points

Reference points are registered in NX Part Navigator in the [Non-timestamp Geometry] folder, grouped by validation items. For operations involving the reference points (Show/Hide the reference points, Delete, etc.), select a group and right-click to access the context menu.



4. Healing

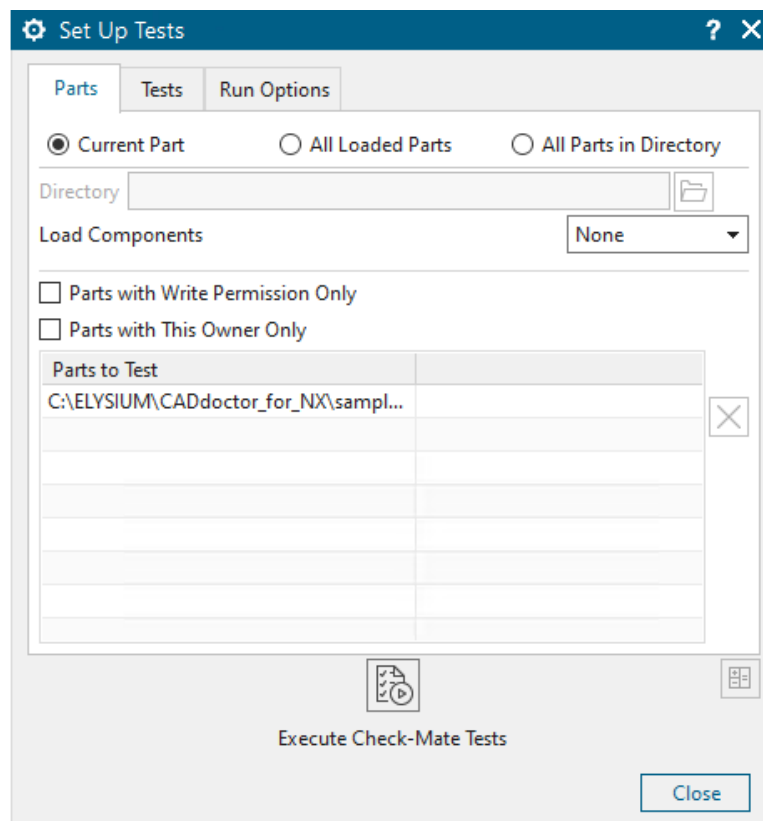
4.1. Healing Parts

This is an option for geometry healing; heal the entire parts regardless of the check result. (Geometry healing will be performed thoroughly including the area where no errors are detected)

4.1.1. Select Parts to Heal

Click [Parts] tab in [Set Up Tests] dialog, and select one of the following items.

- [Current Part]
To heal the part currently shown in the graphics window
- [All Loaded Parts]
To heal all parts currently loaded in NX
- [All Parts in Directory]
To heal all part files in the selected folder



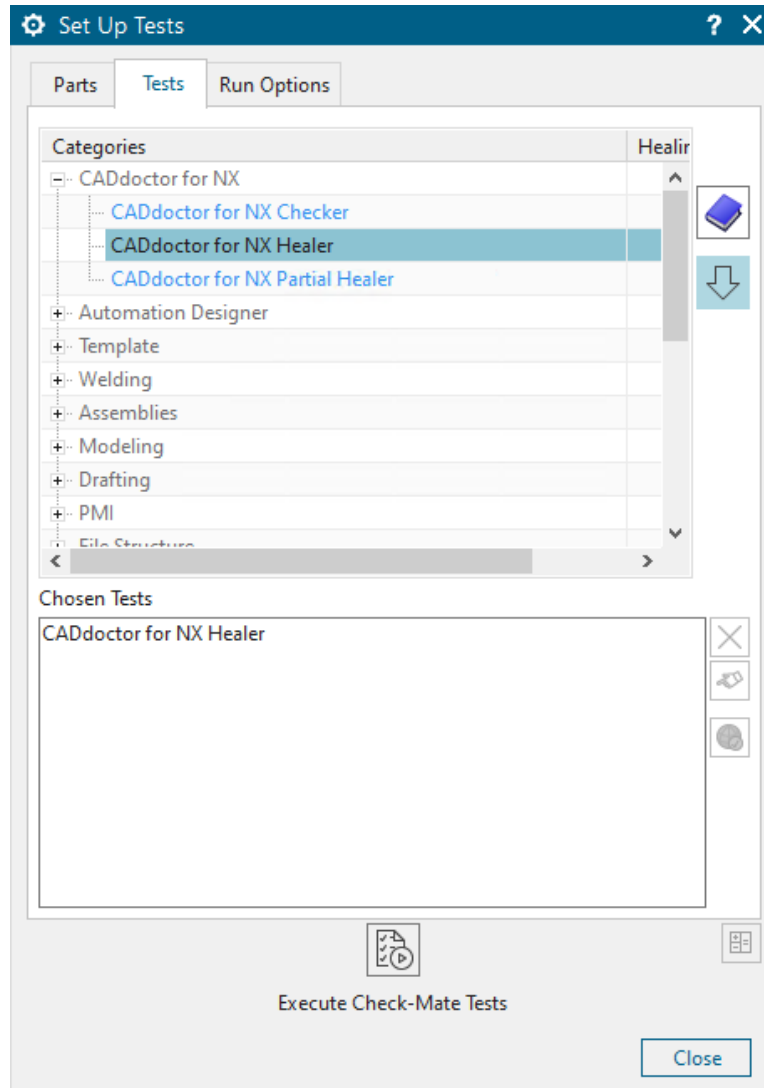
There are two ways to specify an assembly model as the target.

- Open all the parts that make up the assembly, and select "All Loaded Parts"
- Open top part of the assembly, and select "All Levels" for the Load Components.

4.1.2. Select CADdoctor for NX Healer

To heal the entire model, select [Test] tab, and add "CADdoctor for NX Healer" from "Categories" to "Chosen Test".

Select "CADdoctor for NX Healer" from "Categories" list, and click [Add] () to add it to "Chosen Tests" list, or double-click to add it to "Chosen Tests" list.

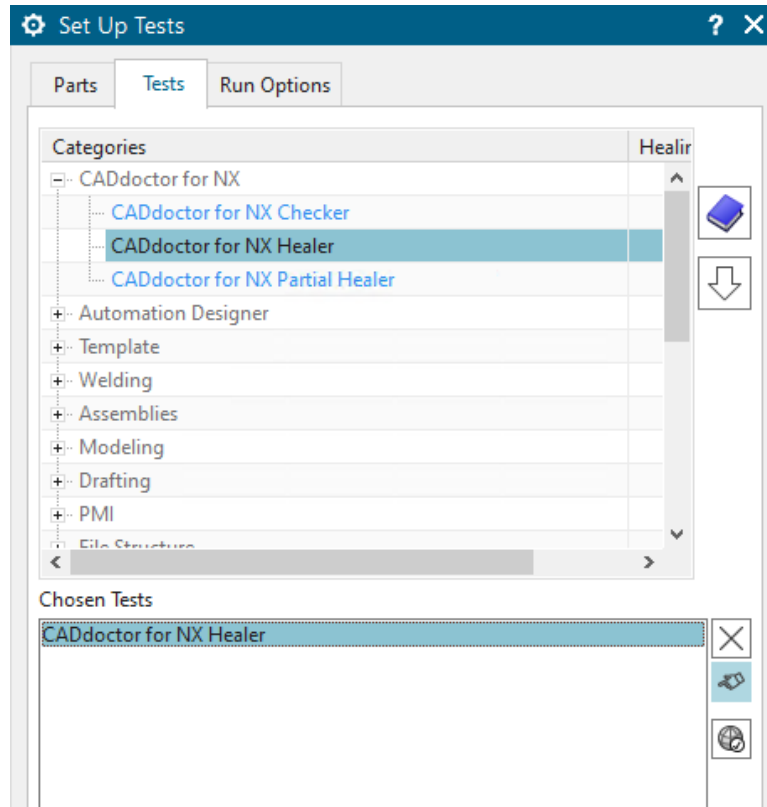


4.1.3. Specify Customization

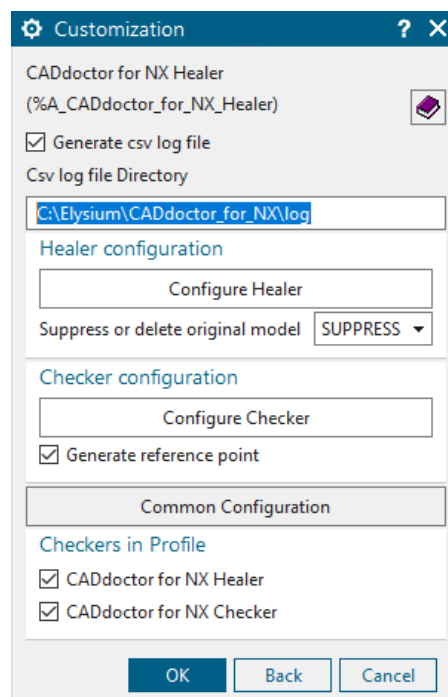


Optional. Customize the settings only if you want to change the default settings.

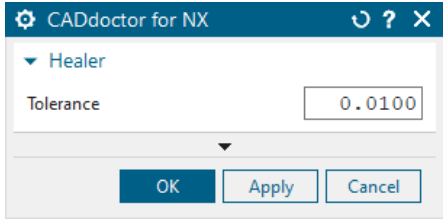
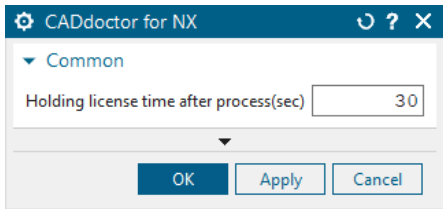
After clicking [Tests] tab, select "CADdoctor for NX Checker" in "Chosen Tests" and then click [Customize] ().



The following [Customization] dialog will appear.



The following options can be configured in [Customization] dialog.

Option	Details
Generate csv log file	Export files for healing results in CSV format. Files are created in the specified folder with the filename [year (last two digits)] [month] [day] [hour] [minute] [second]_user name_heal.csv.
Csv log file Directory	Indicate the folder in which you want to save results files in CSV format. (This selection is valid only if the [Generate csv log file] option is selected.) Note: Folder names that include Japanese characters cannot be selected.
Configure Healer	Set the tolerance used for healing. Click [Configure Healer] and the following dialog will appear. 
Suppress or delete original model	Select whether the original model should be suppressed or deleted after healing.
Configure Checker	Set validation items and the thresholds. Please refer to 3.1.3, "Specify Customization" for more details.
Generate reference point	Generate reference points in the NX model to identify the exact positions of errors.
Common Configuration	Set common configuration of Checker and Healer. Click [Common Configuration] and the following dialog will appear.  Holding license time after process(sec) : If saving each part takes a long time, specify a larger value. Default value is 30.
Checkers in Profile	If "CADdoctor for NX Checker" is checked, CADdoctor for NX Checker runs after healing.

4.1.4. Specify Execution Options



Optional. Customize the settings only if you want to change the default settings.

After clicking [Run Options] tab, from the pull-down menu of "Save Part After Checking", select "Save if Passed". Enable "Generate Check Flag" and "Treat Warning as Pass". These settings make it possible to add a flag to the model which has passed all Standard Criteria.

To save [Run Options] settings, save the settings on [Run Options] tab by clicking the NX [File] menu and selecting [Utilities] > [Custom Defaults] > [Analysis] > [Check-Mate].



When selecting "All Parts in Directory" on [Parts] tab, the reference points will not be saved if errors are detected. If you need reference points, from the pull-down menu of "Save Part After Checking", select "Always Save".

The screenshot shows the 'Set Up Tests' dialog box with the 'Run Options' tab selected. The dialog has three tabs: 'Parts', 'Tests', and 'Run Options'. The 'Run Options' tab contains the following settings:

- ☐ Stop on an Error
- ☐ Stop on a Warning
- Save Part After Checking: Always Save (dropdown menu)
- Smart Check Options**
 - ☒ Generate Check Flag
 - ☒ Treat Warning as Pass
 - ☐ Skip Checking if Check Flag is Up-to-date
 - ☐ Read Flag without Part Loading
- ☐ Generate an External Log File: One log per session (dropdown menu)
- Save Results to Log File in:
 - Directory: C:\ELYSIUM\CADdoctor_for_NX\log\ (text field with folder icon)
 - ☐ Publish Results to Quality Dashboard (with help icon)
- Display Results Options**
 - Always Display (dropdown menu)
 - ☒ Automatically Update Results when Work Part Changed

At the bottom of the dialog, there is a button labeled 'Execute Check-Mate Tests' and a 'Close' button.

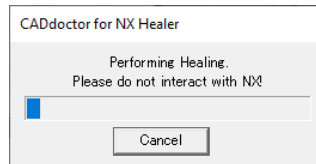
4.1.5. Execute Healing

Click [Execute Check-Mate Tests] () to start healing.

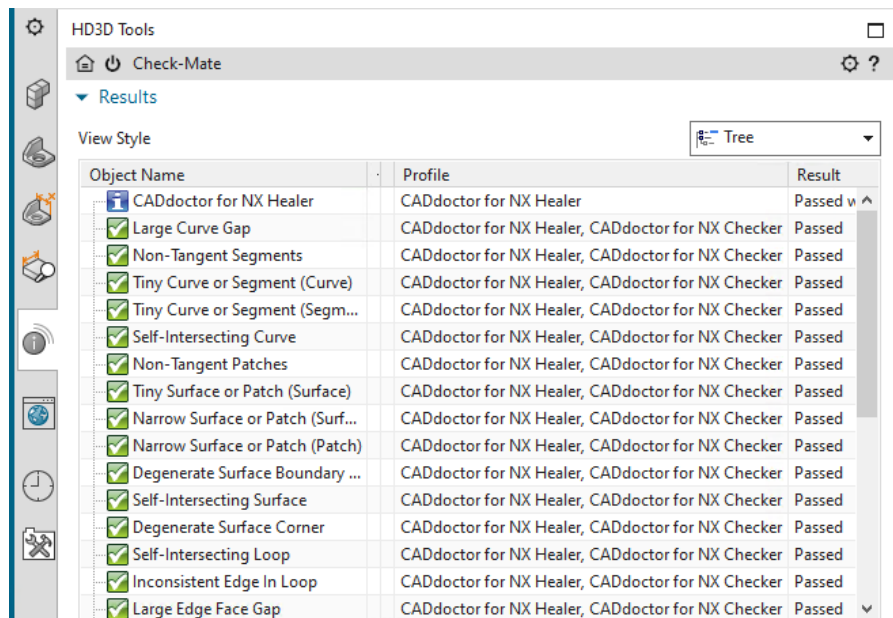
A progress indicator will appear after healing begins. To cancel healing currently underway, click [Cancel].



Do not perform NX operations during healing.



When processing is complete, the Check-Mate results dialog will appear. If Checker is set to run after healing, the result of Checker will appear together. Please refer to "3.2, "Checking Error Positions"" for detail on how to investigate errors.



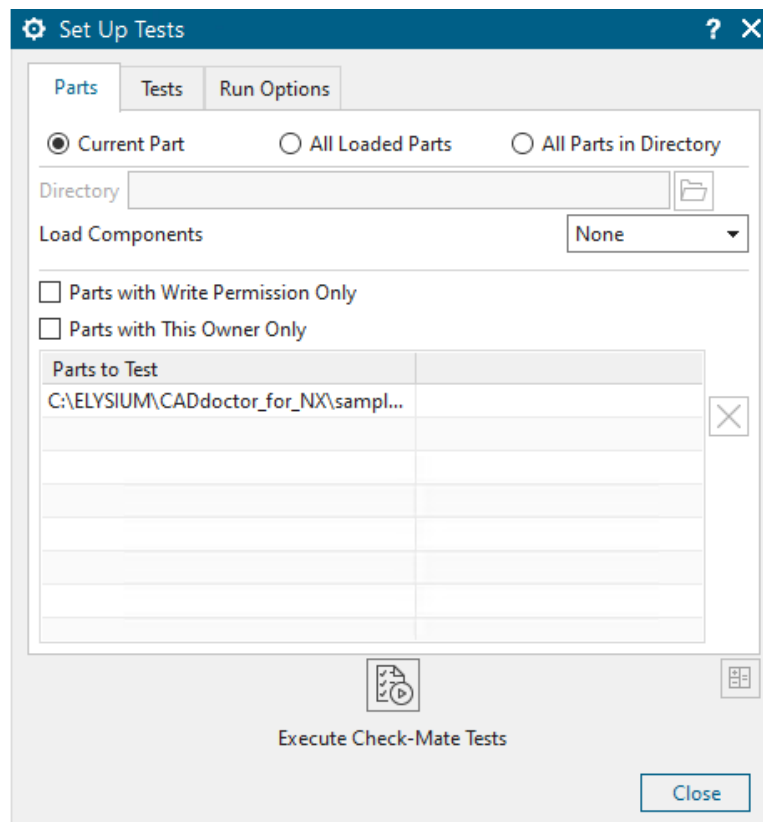
4.2. Heal Error Elements Only

This is an option for geometry healing; heal the errored elements only. (All the rest will remain as is)

4.2.1. Select the Parts to Heal

Click [Parts] tab in "Set Up Tests" dialog, and select one of the following items:

- [Current Part]
To heal the part currently shown in the graphics window
- [All Loaded Parts]
To heal all parts currently loaded in NX
- [All Parts in Directory]
To heal all part files in the selected folder



There are two ways to specify an assembly model as a target:

- Open all the parts that constitute an assembly and select "All Loaded Parts"
- Open top part of an assembly and select "All Levels" for the Load Components

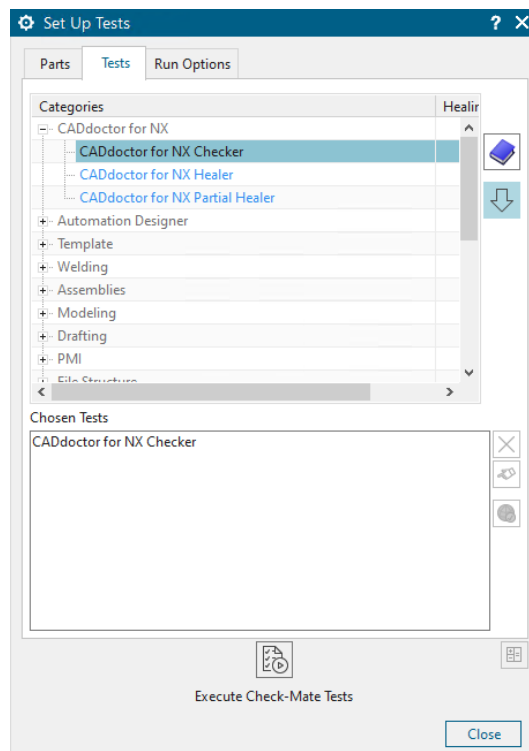
4.2.2. Run [CADdoctor for NX Checker]

In partial healing, only the errors detected beforehand can be healed. Therefore, perform geometry check beforehand, and then perform partial healing only when errors are detected.

Only the following errors are subject to partial healing. If the error described here is not detected, then partial healing will have no effect.

- Tiny Curve or Segment (Curve)
- Narrow Face
- Over-Used Edge
- Inconsistent Edge In Loop
- Large Edge Face Gap
- Large Face Gap
- Large Curve Gap
- Self-Intersecting loop
- Self-Intersecting Surface
- Non-Tangent Segments
- Non-Tangent Patches
- Tiny Curve or Segment (Segment)
- Narrow Surface or Patch (Patch)
- Self-Intersecting Curve

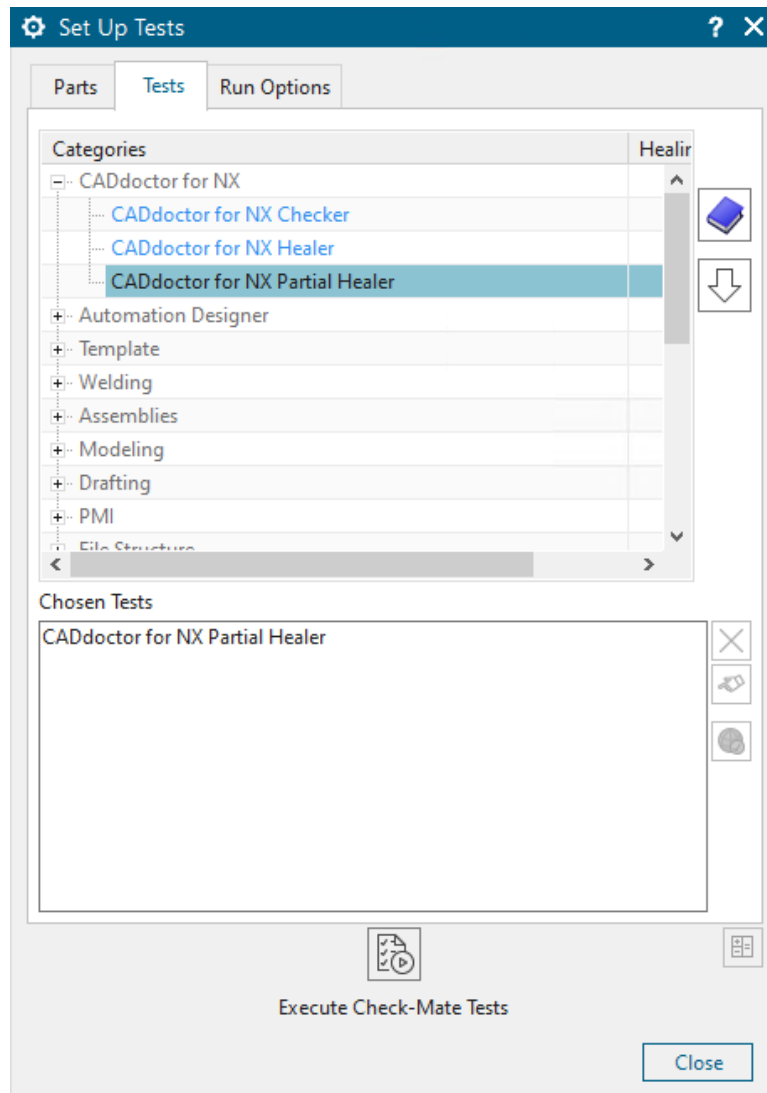
Please refer to [3.1, “Diagnosing Parts”](#) for details on geometry check.



4.2.3. Select CADdoctor for NX Partial Healer

After clicking the [Tests] tab, add "CADdoctor for NX Partial Healer" from "Categories" to "Chosen Tests".

With "CADdoctor for NX Partial Healer" selected in "Categories", click [Add] () or double-click "CADdoctor for NX Partial Healer" to add it for testing.

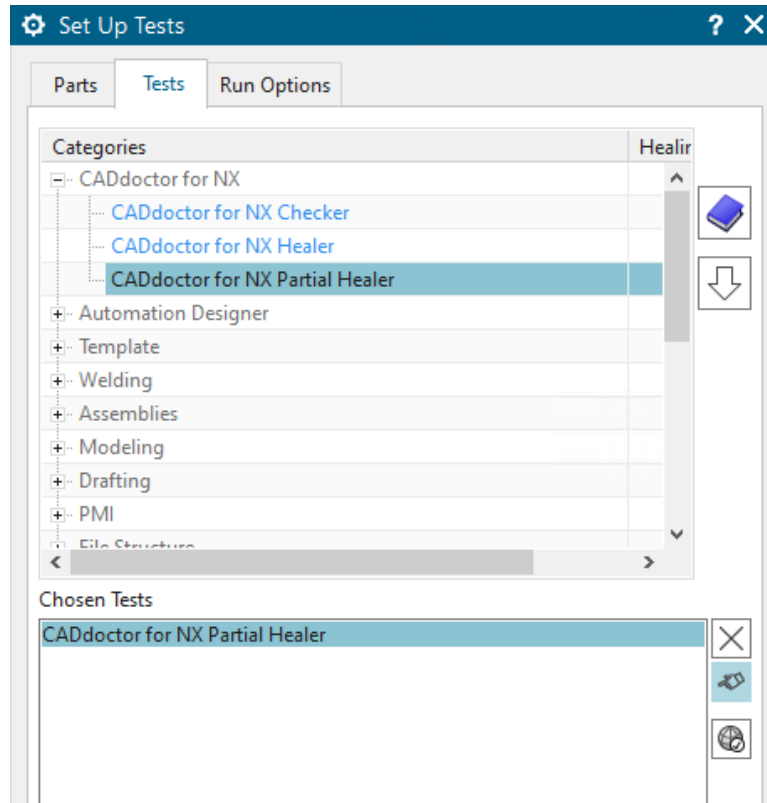


4.2.4. Specify Customization

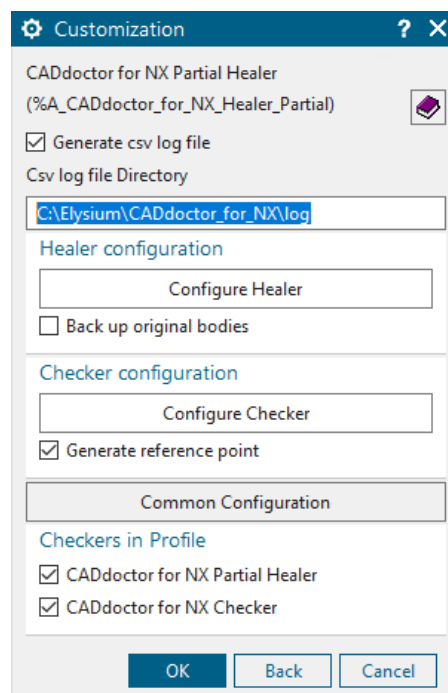


Optional. Customize the settings only if you want to change the default settings.

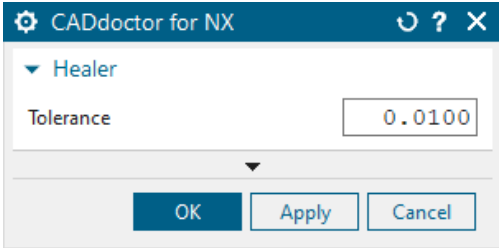
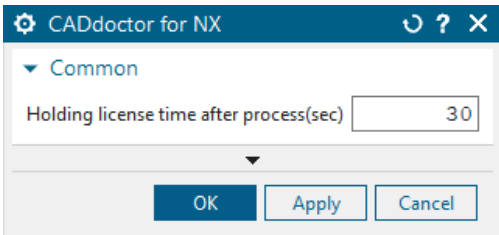
After clicking [Tests] tab, select [CADdoctor for NX Partial Healer] in "Chosen Tests", and then click [Customize] ().



The following "Customization" dialog will appear.



The following options can be configured in "Customization" dialog.

Option	Details
Generate csv log file	Export files for healing results in CSV format. Files are output in the specified folder with the filename [year (last two digits)] [month] [day] [hour] [minute] [second]_user name_heal.csv.
Csv log file Directory	Indicate the folder in which you want to save results files in CSV format. (This selection is valid only if the option "Generate csv log file" is selected.) Note: Folder names that include Japanese characters cannot be selected.
Configure Healer	Set the tolerance used for healing. Click [Configure Healer] and the following dialog will appear. 
Back up original bodies	Check this option to create a copy of original bodies (before geometry healing state) as a backup.
Configure Checker	Set validation items and the thresholds. Refer to 3.1.3, "Specify Customization" for details.
Generate reference point	Generate reference points in the NX model to identify the exact positions of errors.
Common Configuration	Set common configuration of Checker and Healer. Click [Common Configuration] and the following dialog will appear.  Holding license time after process(sec) : If saving each part takes a long time, specify a larger value. Default value is 30.
Checkers in Profile	If "CADdoctor for NX Checker" is checked, CADdoctor for NX Checker runs after healing.

4.2.5. Specify Execution Options



Optional. Customize the settings only if you want to change the default settings.

After clicking [Run Options] tab, from the pull-down menu of "Save Part After Checking", select "Save if Passed". Enable "Generate Check Flag" and "Treat Warning as Pass". These settings will allow a flag to be added to the model which has passed all Standard Criteria.

To save [Run Options] settings, save the settings on [Run Options] tab by clicking the NX [File] menu and selecting [Utilities] > [Custom Defaults] > [Analysis] > [Check-Mate].



When selecting "All Parts in Directory" on [Parts] tab, reference points will not be saved if errors are detected. If you need reference points, in the pull-down menu of "Save Part After Checking", select "Always Save".

The screenshot shows the 'Set Up Tests' dialog box with the 'Run Options' tab selected. The dialog has three tabs: 'Parts', 'Tests', and 'Run Options'. The 'Run Options' tab contains the following settings:

- ☐ Stop on an Error
- ☐ Stop on a Warning
- Save Part After Checking: Always Save (dropdown menu)
- Smart Check Options**
 - ☒ Generate Check Flag
 - ☒ Treat Warning as Pass
 - ☐ Skip Checking if Check Flag is Up-to-date
 - ☐ Read Flag without Part Loading
- ☐ Generate an External Log File: One log per session (dropdown menu)
- Save Results to Log File in:
 - Directory: C:\ELYSIUM\CADdoctor_for_NX\log\ (text field with folder icon)
 - ☐ Publish Results to Quality Dashboard (with help icon)
- Display Results Options**
 - Always Display (dropdown menu)
 - ☒ Automatically Update Results when Work Part Changed

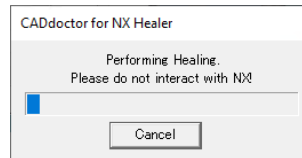
At the bottom of the dialog, there is a button labeled 'Execute Check-Mate Tests' and a 'Close' button.

4.2.6. Execute Healing

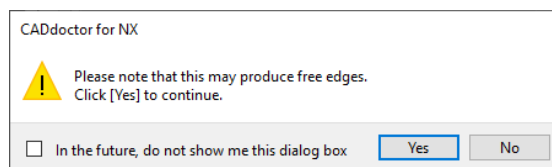
1. Click [Execute Check-Mate Tests] () to start healing.
2. A progress indicator appears after healing begins. To cancel healing currently underway, click [Cancel].



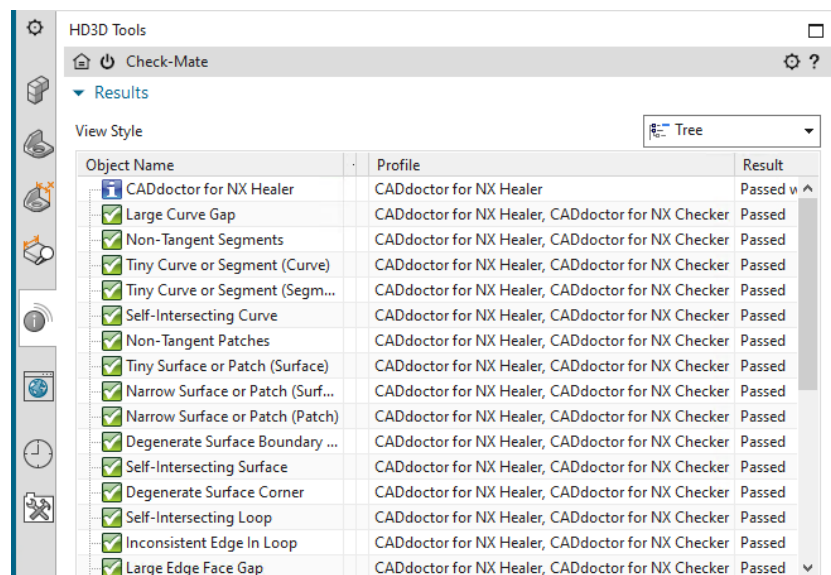
Do not perform NX operations during healing.



3. After executing healing, you may have free edges, and a warning will appear. After confirming, click [Yes].



When processing is complete, the Check-Mate results dialog will appear. If checker is set to run after healing, the result of Checker will appear together. Please refer to "3.2, [“Checking Error Positions”](#)" for details on how to investigate errors.



Please note that when "Checker → Healer / Partial Healer → Checker" is executed continuously, the result of the part passing the second time in Checker will not be saved, even if from the pull-down menu of "Save Part After Checking", the option "Save if Passed" is selected. The check after Healer / Partial Healer execution should be performed separately with Checker only.



Internal process of partial healing is to replace the original errored face with a new face created based on the original face. If the SEW command is successful for the created face, the body containing the face will be added to the feature group [SEW SUCCESS]. In contrast, if the SEW command fails, the created face will be suppressed and the body containing it will be added to the feature group [SEW FAILURE].

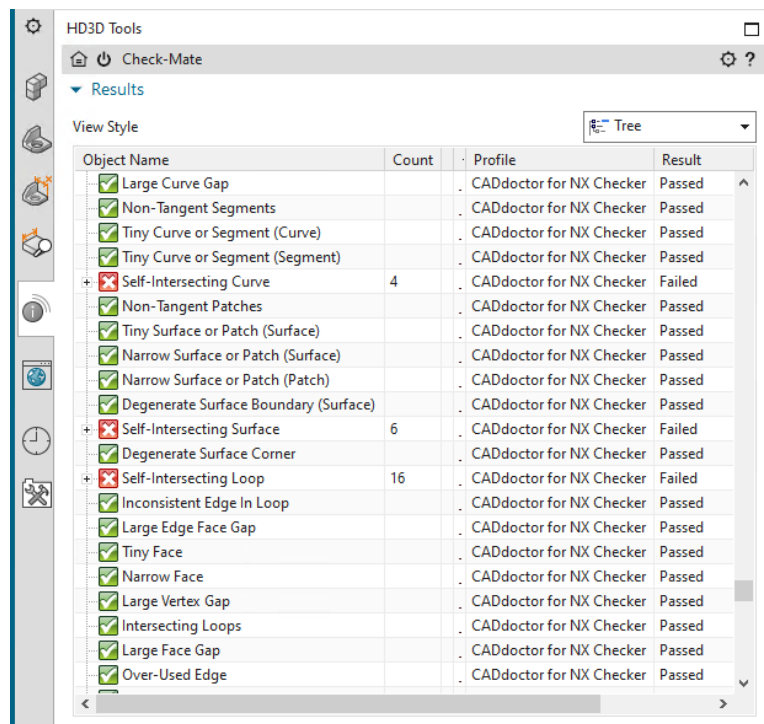
5. Checking Results

For general Check-Mate operating instructions, please refer to the Check-Mate manual provided with NX.

The most recent Check-Mate results can be displayed via various NX commands, as described below.

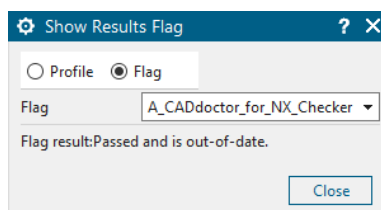
5.1. Checking Detailed Results

From the NX menu, select [Analyze] > [Check-Mate] > [View Check-Mate Results].



5.2. Checking Results Flags

1. From the NX menu, select [Analyze] > [Check-Mate] > [Show Results Flag].
2. Select "Flag".
3. In the Flag list, select "A_CADdoctor_for_NX_Checker". This lets you check for a results flag. Since no flag is generated in the event of a failure, nothing appears in the list.

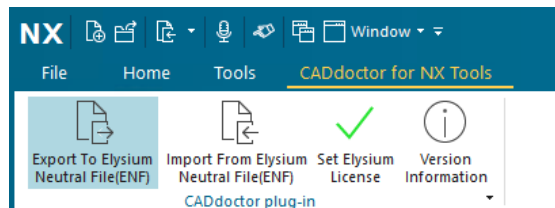


6. Import and Export ENF

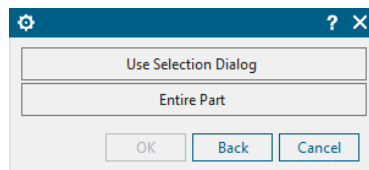
6.1. Export ENF

It is possible to cooperate with other Elysium products by translating NX models to Elysium Neutral Files (ENF).

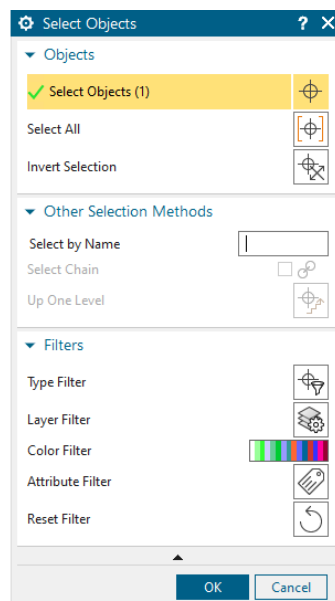
1. Open the NX model to translate.
2. Select [CADdoctor for NX Tools] tab > [Export To Elysium Neutral File(ENF)] from the menu.



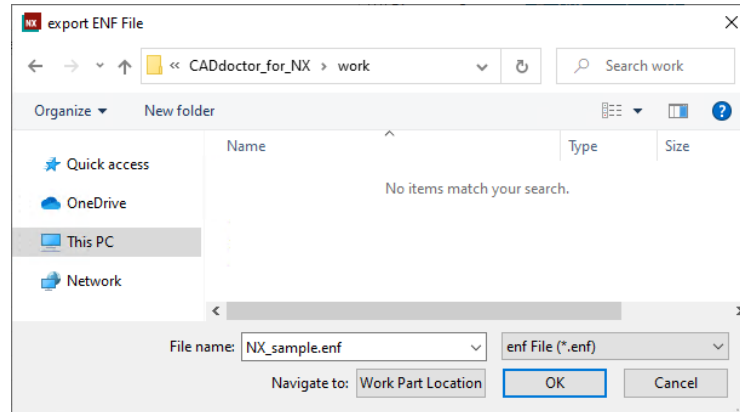
3. Set the target objects for translation. If you want to translate target objects partially, select [Use Selection Dialog] to specify objects. To translate all objects in the model, select [Entire Part].



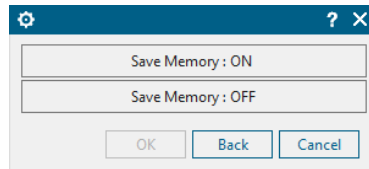
4. When clicking [Use Selection Dialog], you can select objects to translate manually.
There are seven types of target elements: Solid Body, Sheet Body, Curve, Point, Datum Plane, Datum Axis, and Datum CSYS. Datum Plane/Axis and Point that are used in Datum CSYS are not translated. Datum Plane/Axis/CSYS that are owned by assembly are not translated.



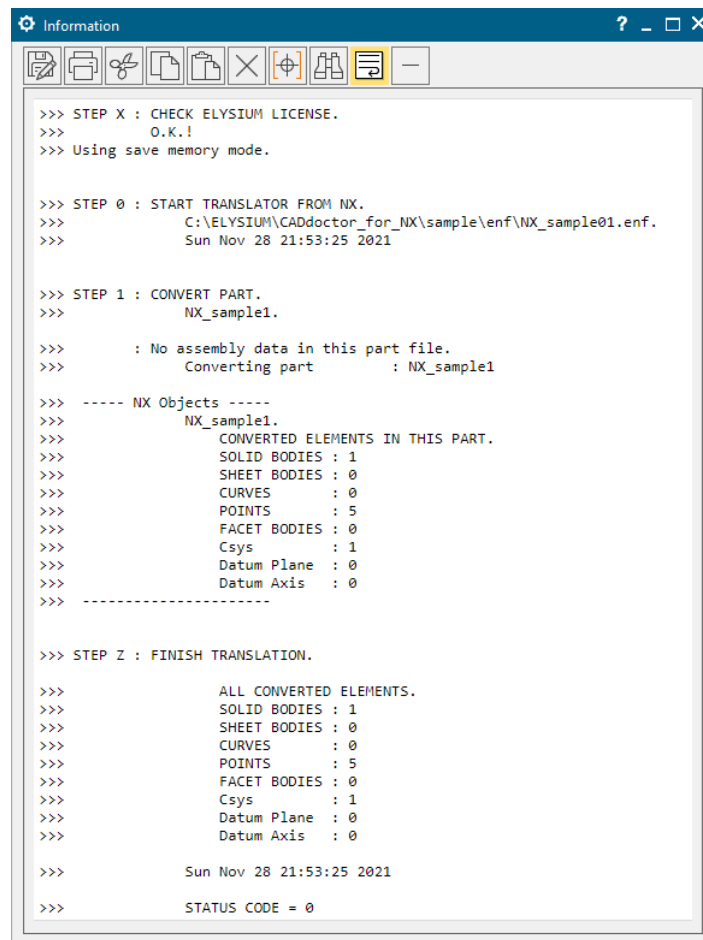
5. Specify an output folder and a file name.



6. Select ON/OFF of save memory mode. If you select [Save Memory: ON], memory usage becomes lower than OFF, but the translation speed becomes a little slower.



7. Translation will start and the logs are displayed. You cannot operate NX until the translation is finished. Afterwards, the specified Elysium Neutral File is saved in the specified folder.





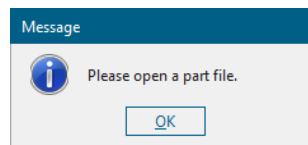
About failures of extracting face

CADdoctor for NX may fail to extract faces for reasons such as it cannot obtain geometry data from the faces. In this case, reference points (red) are created at the midpoint of edges around the failed extraction faces. The reference points are created in NX as independent points of NX.

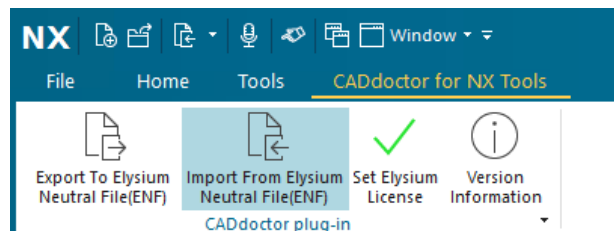
6.2. Import ENF

Elysium Neutral Files(ENF) from other Elysium products can be translated to NX models.

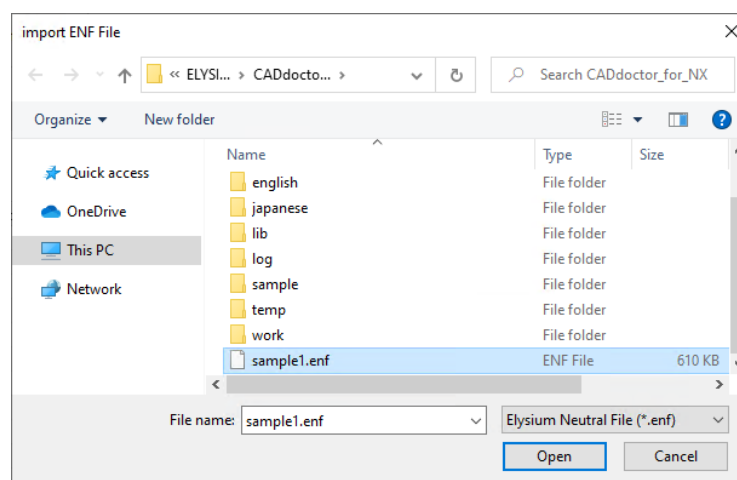
1. Open a part file where ENF file will be imported. When clicking [Import From Elysium Neutral File(ENF)] without opening a part file, the following message will appear. Please ensure to open a part file. (Empty part is also OK)



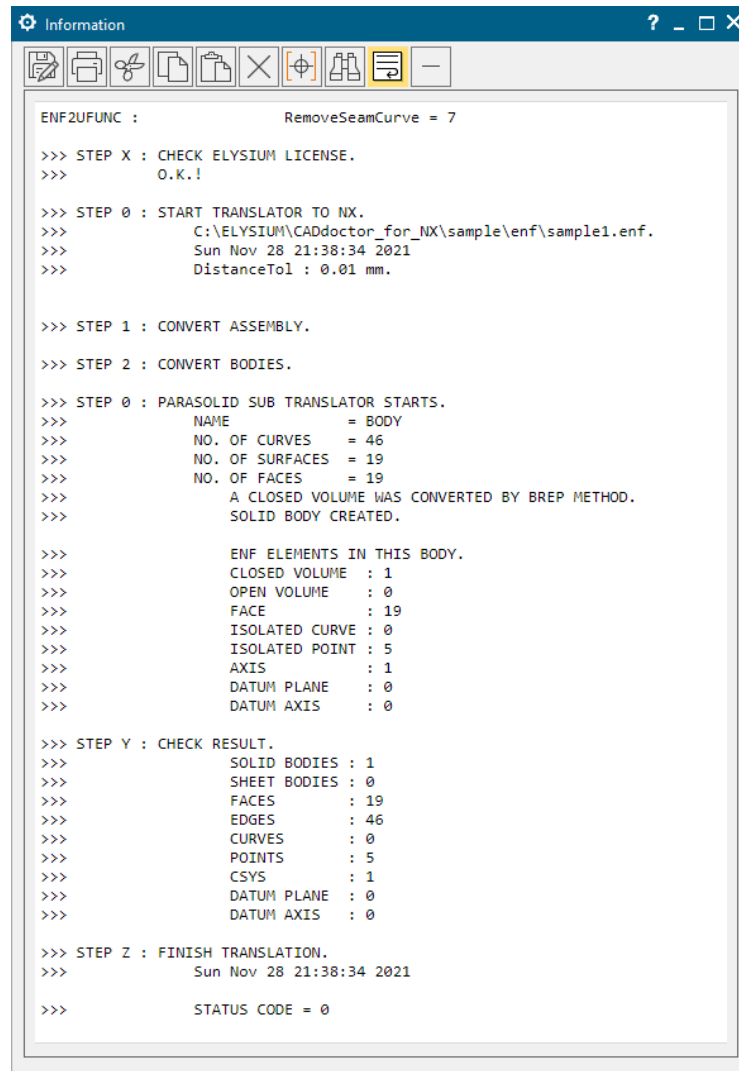
2. Select [CADdoctor for NX Tools] tab > [Import From Elysium Neutral File(ENF)] from the ribbon menu.



3. Specify Elysium Neutral File to import.



The translation starts and the log dialog will appear. You cannot operate NX during translation. When the translation is finished, the imported model will appear in NX.



7. Clean Up Files

7.1. Clean Up Disused Files

CADdoctor for NX may cause files to accumulate in the working folder in the following cases:

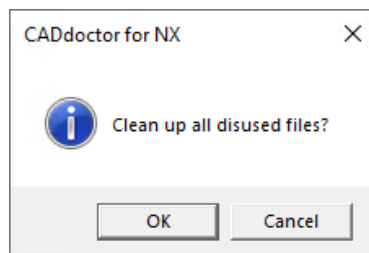
- If the program is terminated improperly
Temporary files needed for program execution are left in the folder.
- If the transfer of the CSV result files fails
CSV result files that could not be transferred remain in the folder.



The working folder is the folder specified during installation.
Default path is "C:\Elysium\CADdoctor_for_NX\temp".

Clean up disused files from the working folder at regular intervals as follows:

1. From the Windows [Start] menu, select [All Programs] > [CADdoctor for NX] > [Clean up disused files]. The following confirmation dialog will appear.



2. Click [OK] to clean up all disused files.

8. Utilities

8.1. CSV Log Files

Description of CSV Log Files

Log files are output when the user runs diagnostics with CADdoctor for NX. CSV Log Files are exported into "result CSV file folder" which is set during installation.

Default path is "C:\Elysium\CADdoctor_for_NX\log".

Timing of Log File Output

Log files are output 30 seconds after diagnostics.

If multiple parts are diagnosed, all diagnostic results will be aggregated 30 seconds after all parts are subjected to diagnostics, after which the logs providing aggregate information are created. If specifying "Holding license time after process(sec)", the file is created according to the specified time instead of the above 30 seconds.

8.1.1. CSV Log Files for PDQ Diagnostic Results (JOBID_user name_PDQ.csv)

Log files for PDQ diagnostic results consist of the following three items:

[Header] : Indicates the time at which diagnostics were run.

[Summary] : Gives diagnostic results for each part.

[Check Results] : Indicates detailed PDQ diagnostic results for each part.

- Checker is not executed for the flagged parts and the check results of the parts are not exported to the log file when the Run Options of Check-Mate "Skip checking if Check Flag is up-to-date" is enabled.
- Check results of the parts for which diagnostics were canceled are exported to the log file as spaces.
- Check results of the parts which has no elements are exported to the log file as spaces.

[Header]						
File Name						
Execute Time						
2010/5/17 0:00						
[Summary]						
No	CheckResult	Part Name	Part Number	Version	Status	
1	OK					
2	NG					
3	OK					
4	OK					
5	NG					
6	NG					
7	NG					
[Check Results]						
-- Body Name --						
Category Name	Tiny Curve or Segment (Curve)	Narrow Face	Over-Used Edge	Inconsistent Edge In Loop	Large Edge Face Gap	Large
Threshold	0.01	0.01				0.01
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	2	1	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0

8.1.2. CSV Log Files for PDQ Healing Results (JOBID_user name_heal.csv)

CSV Log Files for PDQ Healing Results will output the following information beginning from the left.

170401123845	testuser	sample1	sample1	2017/4/1 12:38	0:00:22	CADdoctor for NX Ver 3.0.0	Partial Healing	yes
170401124613	testuser	sample2	sample2	2017/4/1 12:46	0:01:49	CADdoctor for NX Ver 3.0.0	Healing	yes

- JOBID (year(last two digits) + month + day + time)
- User Name
- Part Name (UG Part Attribute DB_PART_NAME)
- Part No. (UG Part Attribute DB_PART_NO)
- Start Time
- Healing Time
- CADdoctor for NX Version
- Process Mode
- Healed (yes/no)

Appendix A: Check Items

A.1. Check Items List

Check Items are classified into Standard Criteria and Warning Criteria.

Standard Criteria

All errors must be corrected to obtain a data quality assurance key. If errors remain, "Failed" is issued to the confirmed section.

Warning Criteria

To ensure data quality, these criteria require checking (but not necessarily correction) of the shape.

If no errors exist with respect to standard criteria and the only remaining errors are with respect to warning criteria, "Passed with Warning" is issued to the confirmed section.

No.	Standard Criteria	Description
1	Large Curve Gap	Detect gaps exceeding the threshold between endpoints shared by adjacent curves.
2	Non-Tangent Segments	Detect non-tangent edges that form angles exceeding the threshold between adjacent segments in edges.
3	Tiny Curve or Segment (Curve)	Detect curves and edges that are shorter than the threshold.
4	Tiny Curve or Segment (Segment)	Detect curve and edge segments shorter than the threshold.
5	Self-Intersecting Curve	Detect instances where a curve or edge intersects itself within the threshold.
6	Non-Tangent Patches	Detect non-tangent surfaces that form angles exceeding the threshold between adjacent patches in surfaces.
7	Tiny Surface or Patch (Surface)	Detect surfaces with area less than the threshold.
8	Narrow Surface or Patch (Surface)	Detect surfaces whose distance between an opposite pair of boundary curves is less than the threshold.
9	Narrow Surface or Patch (Patch)	Detect surface patches with sides of width less than the threshold in the transverse (narrower) direction.
10	Degenerate Surface Boundary (Surface)	Detect surfaces with a boundary curve of length less than the threshold (but not zero).

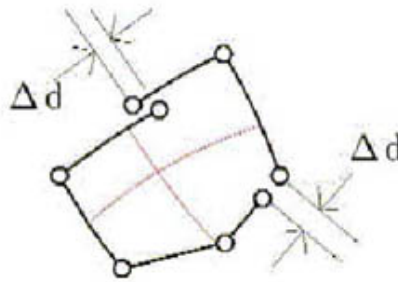
No.	Standard Criteria	Description
11	Self-Intersecting Surface	Detect instances where a curved surface intersects itself within the threshold.
12	Degenerate Surface Corner	Detect surfaces where the angle at the shared endpoints of adjacent edges is within the threshold (or the difference from 180 degrees is within the threshold).
13	Self-Intersecting Loop	Detect instances where edges in a loop intersect. Does not check acute angles formed by adjacent edges.
14	Inconsistent Edge In Loop	Detect inconsistency between the parametric direction of an edge in an edge loop and the loop direction.
15	Large Edge Face Gap	Detect gaps exceeding the threshold between trim edges on a trim surface and the underlying surface.
16	Tiny Face	Detect faces with area less than the threshold.
17	Narrow Face	Detect faces with a maximum width of less than the threshold in the transverse (narrower) direction.
18	Large Vertex Gap	Detect gaps exceeding the threshold between vertices on a face and the underlying surface.
19	Intersecting Loops	Detect instances where 2 loops in a face are interfering within the threshold.
20	Large Face Gap	Detect gaps exceeding the threshold along seams shared by adjacent faces.
21	Over-Used Edge	Detect individual edges shared by three or more faces.
22	Sharp Face Angle	Detect instances where 2 adjacent faces form an angle at a common edge less than the threshold.
23	Tiny Solid	Detect solids with volume less than the threshold.
24	Solid Void	Detect solids with one or more inner shells.

No.	Warning Criteria	Description
25	Embedded Faces	Detect overlapping of two faces where one face partially overlaps the other (by less than the threshold) or is completely embedded. When "n" faces overlap, then $nC2 = n!/(n-2)!2!$ problems are detected.
26	Free Edge	Detect individual edges used by only 1 face.

A.1.1. Check Items List

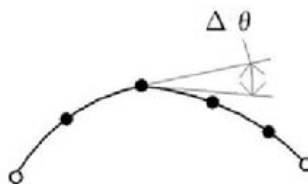
1. Large Curve Gap

- Criterion : Detect gaps exceeding the threshold between endpoints shared by adjacent curves.
- Detection : Threshold < Δd



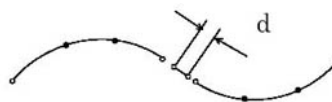
2. Non-Tangent Segments

- Criterion : Detect non-tangent curves and edges that form angles exceeding the threshold between adjacent segments in edges.
- Detection : Threshold < $\Delta\theta$



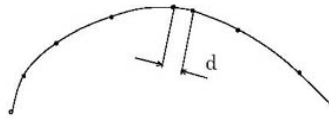
3. Tiny Curve or Segment (Curve)

- Criterion : Detect curves and edges that are shorter than the threshold.
- Detection : $0 \text{ mm} \leq d < \text{Threshold}$



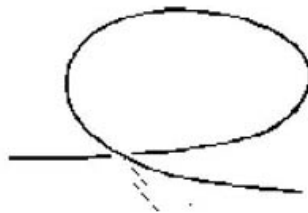
4. Tiny Curve or Segment (Segment)

- Criterion : Detect curve and edge segments shorter than the threshold.
- Detection : $0 \text{ mm} \leq d < \text{Threshold}$



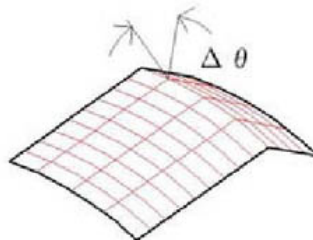
5. Self-Intersecting Curve

- Criterion : Detect instances where a curve or an edge intersects itself within the threshold.
- Detection : $d < \text{Threshold}$



6. Non-Tangent Patches

- Criterion : Detect non-tangent surfaces that form angles exceeding the threshold between adjacent patches in surfaces.
- Detection : $\text{Threshold} < \Delta\theta$



7. Tiny Surface or Patch (Surface)

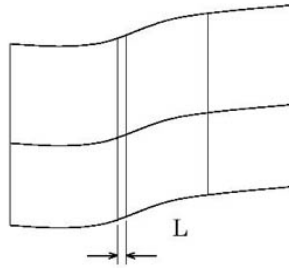
- Criterion : Detect surfaces with area less than the threshold.

8. Narrow Surface or Patch (Surface)

- Criterion : Detect surfaces whose distance between an opposite pair of boundary curves is less than the threshold.

9. Narrow Surface or Patch (Patch)

- Criterion : Detect surface patches with sides of width less than the threshold in the transverse (narrower) direction.
- Detection : $0\text{mm} \leq L < \text{Threshold}$

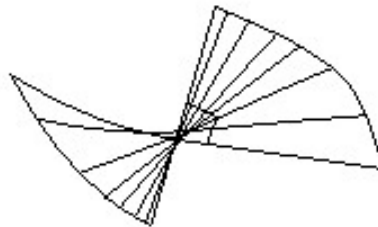


10. Degenerate Surface Boundary (Surface)

- Criterion : Detect surfaces with a boundary curve of length less than the threshold (but not zero).

11. Self-Intersecting Surface

- Criterion : Detect instances where a surface intersects itself (two different points are within the threshold).
- Detection : $d < \text{Threshold}$

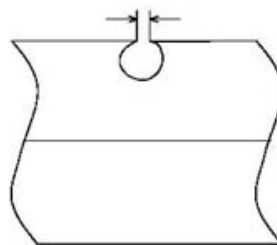


12. Degenerate Surface Corner

- Criterion : Detect surfaces with a boundary curve of length less than the threshold (but not zero).

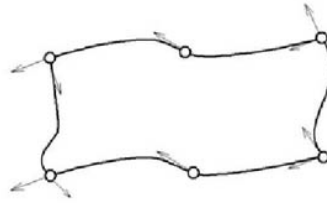
13. Self-Intersecting Loop

- Criterion : Detect instances where edges in a loop self-intersect (two different points are within the threshold). Does not check acute angles formed by adjacent edges.
- Detection : $d < \text{Threshold}$



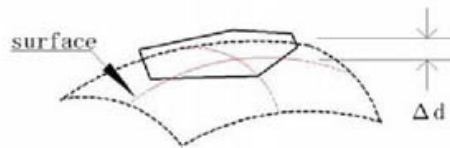
14. Inconsistent Edge In Loop

- Criterion : Detect inconsistency between the parametric direction of an edge in the edge loop and the loop direction.



15. Large Edge Face Gap

- Criterion : Detect gaps exceeding the threshold between trim edges on a trim surface and the underlying surface.
- Detection : $\text{Threshold} < \Delta d$

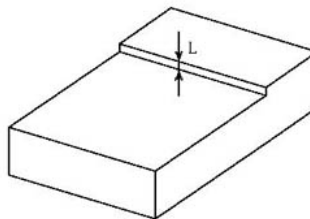


16. Tiny Face

- Criterion : Detect faces with area less than the threshold.

17. Narrow Face

- Criterion : Detect faces with a narrower width less than the threshold.
- Detection : $0\text{mm} \leq L < \text{Threshold}$



18. Large Vertex Gap

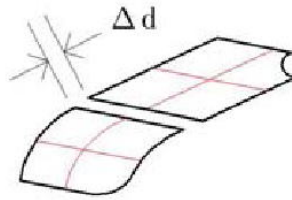
- Criterion : Detect gaps exceeding the threshold between vertices on a face and the underlying surface.

19. Intersecting Loops

- Criterion : Detect instances where 2 loops in a face are interfering within the threshold.

20. Large Face Gap

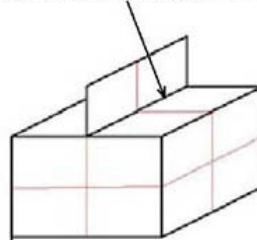
- Criterion : Detect gaps exceeding the threshold along seams shared by adjacent faces.
- Detection : $\text{Threshold} < \Delta d$



21. Over-Used Edge

- Criterion : Detect individual edges shared by three or more faces.
- Detection : $3 \leq \text{Number of elements sharing edge } i$

Edge shared by three or more faces



22. Sharp Face Angle

- Criterion : Detect instances where 2 adjacent faces form an angle at a common edge less than the threshold.

23. Tiny Solid

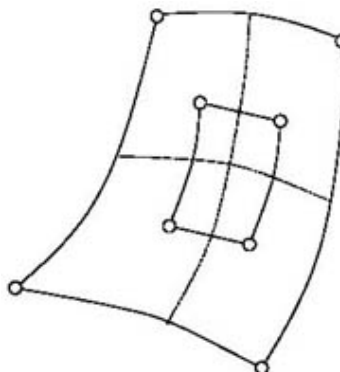
- Criterion : Detect solids with volume less than the threshold.

24. Solid Void

- Criterion : Detect solids with one or more inner shells.

25. Embedded Faces

- Criterion : Detect overlapping of two faces where one face partially overlaps the other (by less than the threshold) or is completely embedded.
When n faces overlap, then $nC2 = \frac{n!}{(n-2)!2!}$ problems are detected.
- Detection : $0\text{mm} \leq d < \text{Threshold}$



26. **Free Edge**

- Criterion : Detect individual edges used by only 1 face.

Appendix B: Notes on Results Flag

B.1. Description of Results Flag

Results flag

It is a proof of data quality. When the CADdoctor for NX Checker diagnostics issues a Pass judgment (including passing with added information or warnings), the flag is appended to the part.

B.2. Validity of Results Flag

Check-Mate diagnostic results are invalidated if NX operations setting a part modification flag are performed (operations causing a [Modified] note to be displayed next to the part file name on the toolbar).

- Specific examples of operations that invalidate checking results are given below:

1	All operations that change shapes
2	Changing the rendering style (e.g., from shading to wireframe)
3	Changing the status between constrained and unconstrained
4	Changing the colors of elements
5	If editing mode is accessed via a history (even if no editing is done and the operation is ultimately canceled, an Invalid flag is set)
6	Moving layers (*1)
7	Toggle between show and hide (*2)

- (*1) Merely switching the active layer will not invalidate the guarantee. However, moving some elements to another layer will invalidate the guarantee.
- (*2) When switching to hidden, even if an element is not actually hidden, merely receiving a Hide command will set an Invalid flag. (For Show commands, merely receiving a command will not set an Invalid flag.)

The validity of diagnostic results can be checked from the NX menu by selecting [Analysis] > [Check-Mate] > [Display Results Flag]. (Refer to [5, Checking Results.](#))

Appendix C: Notes

C.1. Diagnostics of Parts under Assemblies

If an assembly is selected for diagnostics, the parts under the assembly are not automatically subject to diagnostics. Follow the Check-Mate procedure for diagnostics (Refer to "[3.1.1, “Select Parts to Diagnose”](#)") and explicitly select all the parts to be diagnosed.

C.2. Free Space of the Drive Specified as the Temporary Folder

Make sure that the hard disk specified as the temporary folder in the installation has at least as much free space as the part to be diagnosed.

C.3. Deleting Disused Files

Files used temporarily by the tool may not be deleted from the temporary folder specified in the installation when the program is shut down incorrectly. Manually delete any files in this folder at periodic intervals if disused files are accumulated.

Appendix D: Glossary

D.1. Check Item Terms

1	Geometric element	Defines an object's shape and its position. Examples: Lines, curves, planes, surfaces of revolution, surfaces, etc.
2	Topological element	Defines the point or line at which each element is joined. Examples: Solids, faces, edges, vertices, etc.
3	Curve	A geometric element indicating an object's curve shape; an infinite curve. As used for check items, the definition also includes edges.
4	Edge	Topological elements demarcated by two vertices indicating start and end points.
5	Edge loop	An outline of a surface comprising of multiple closed edges.
6	Segment	An element comprising of an edge. A single curve comprises multiple segments.
7	Face	A topological element with a base surface trimmed by edges.
8	Base surface	The original surface to be trimmed.
9	Surface	Same as base surface. As used for check items, the definition also includes faces.
10	Surface patch	A lattice element comprising of a base surface. A single base surface comprises from multiple patches.

Appendix E: Troubleshooting

This section describes error messages and corrective actions.

Q1 : The program has not been installed successfully. Please contact support.

(Environment variable ELY_CDRNX_INSTDIR is not defined.)

(Directory specified by environment variable ELY_CDRNX_INSTDIR does not exist.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q2 : The program has not been installed successfully. Please contact support.

(The folder "Elysium" does not exist.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q3 : The program has not been installed successfully. Please contact support.

(The folder "settings" does not exist.)

(The file "checknut.ini" does not exist.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q4 : The program has not been installed successfully. Please contact support.

(The file "DekCheck.msg" does not exist.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q5 : The program has not been installed successfully. Please contact support.

(The file "adeKernel.ini" does not exist.)

(The file "system.ndr" does not exist.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q6 : The program has not been installed successfully. Please contact support.

(Environment variable ELY_CDRNX_TEMP_DIR is not defined.)

(Directory specified by environment variable ELY_CDRNX_TEMP_DIR does not exist.)

(Directory specified by environment variable ELY_CDRNX_TEMP_DIR is not writable.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q7 : The program has not been installed successfully. Please contact support.

(Directory specified by environment variable ELY_CDRNX_CSV_LOG_DIR does not

exist.)

(Directory specified by environment variable ELY_CDRNX_CSV_LOG_DIR is not writable.)

- A problem occurred with the folder structure, configuration file, or environmental variables following installation. Please contact the support desk.

Q8 : Failed to get a license. Please contact support.

(Failed to communicate with license server.)

(Environment variable ELY_SEC_PORT is not defined.)

(Environment variable ELY_SEC_SERVER is not defined.)

- An error involving the license has occurred. Please contact the support desk.

Q9 : Directory specified by [Tests] > [Customize] does not exist.

Directory specified by [Tests] > [Customize] is not writable.

- Make sure the folder specified for CSV output in the Check-Mate "Customization" dialog exists and is not write-protected. If these requirements are met but the error persists, please contact the support desk.

Q10 : Checking has been canceled.

- This message will appear when [Cancel] is clicked during processing.

Q11 : Checking failed.

- An unknown error occurred during the PDQ check. Please contact the support desk.

Q12 : Failed to write csv log file.

- Make sure the check results of CSV file is not in use by another program. If this requirement is met but the message is displayed again, please contact the support desk.

Q13 : The installation folder is not writable. Failed to change settings.

The folder is not writable.

- Make sure that CADdoctor for NX destination folder, temporary folder, and result CSV file folder exist and are not write-protected. If this requirement is met but the message is displayed again, please contact the support desk.

All rights reserved by Elysium or the original author of this material. The content may not be edited, reproduced, distributed, transmitted, displayed, published, broadcast, sold or lent without the prior permission of the author.