MAXSURF CONNECT Edition V22.03.00 ReadMe 28 February 2020

This ReadMe file describes the changes to the Modules in MAXSURF CONNECT Edition V22.03.00

Licensing:

This product version uses CONNECT Licensing, which does not support SELECT activation key(s). **CONNECT Licensing** features new behavior to enhance your organization's user administration and security with mandatory user sign-in via CONNECTION Client to access the application. If you are already signed in to the CONNECTION Client, you have met this prerequisite. If you have not, please refer to the **Administrator's Resource Center** and/or contact your administrator for assistance in the registration and sign-in process.

https://communities.bentley.com/products/licensing/w/licensing__wiki/37813/connect-licensing

https://www.bentley.com/en/perspectives-and-viewpoints/topics/campaign/bentley-user-registration

Side-by-side installation – important changes:

This version 22 is a major update and will install side-by-side with earlier versions (for example 21.mm).

Minor version updates, such as 21.14 will replace versions 21.13 and 21.02 if already installed on your computer. Side-by-side installation of versions 21.14 and 21.13, 21.12 or 21.02 is not possible.

Bentley versions numbers are MM.mm.sv.bb where MM is the Major version number; mm the minor version number and sv is reserved for special versions (and bb is the build number). From version 21.10 onwards, side-by-side installations of MAXSURF are only possible for different *major* versions. When you are signed in to the CONNECTION client, you will be notified when *minor* updates are available (these are updates with different *minor* version numbers. If you install a *minor* update, the previous version with the *same major* version number will be replaced with the updated version. Thus, installation of version 21.11 will replace 21.11 or 21.02 but would be installed side-by-side with 19.

System Requirements – 64-bit only:

Henceforth MAXSURF and Multiframe will be available in 64bit versions only and will only work with 64bit operating systems.

Contents

Introduction

Product Description / Key capabilities

Visualize and optimize vessel designs with the complete set of integrated naval architecture tools in MAXSURF. Create fair hull shapes, comply with stability requirements, minimize power requirements, and ensure crew and passenger comfort in varying sea states. Minimize structural weight while ensuring scantling compliance through initial modeling and stress analysis of beam and plate structures.

MAXSURF helps you redefine design excellence for any size vessel. Choose the version that fits your project needs:

MAXSURF:	Develop optimal designs for smaller craft using up to 20 NURBS (non-uniform rational basis spline) surfaces.
MAXSURF Advanced:	Optimize the design of larger and more complex vessels using an unlimited number of dynamically trimmed 3D NURBS surfaces for modeling the hull, appendages, and superstructure. Enable your naval architecture team with a full range of functions for designing power, sail, commercial, or naval vessels made from steel, aluminum, or composite materials.
MAXSURF Enterprise:	Comply with the most demanding requirements by extending MAXSURF Advanced with probabilistic damage stability, advanced motions prediction, and dynamic structural analysis.

Superseded and Removed Features

MAXSURF version 22.02 was skipped; the next version after 22.01 is this one: 22.03.

MAXSRUF Structure (aka Workshop), as an individual module, has been discontinued. All the functionality that was available in Structure (for modeling plates, frames, stringers, etc.) has been moved to the MAXSURF Modeler module. This makes it much easier to interactively design and adjust these structural parts in relation to the hull geometry.

MAXSURF Assembly for Rhino has been removed from the installer but can still be downloaded from Bentley Communities:
https://communities.bentley.com/products/offshore/m/mediagallery/273466

Trial keys are no longer used for trial versions; use of software in evaluation and trail modes is now managed through your Bentley sales representative.

Known Issues

There are no known issues with this release.

Before You Begin

Before you begin, please note the following:

Review the End User License Agreement (or EULA) carefully during the installation of MAXSURF. By installing this release, you agree to the terms and conditions of the agreement. A copy of the End User License Agreement named "Eula.pdf" can be found in the location after MAXSURF has been installed.

Installation

Installation Requirements

Supported Operating Systems

Windows 10 (64-bit):	Home, Pro, Enterprise, and Education
Windows 8.1 (64-bit):	Standard, Pro, and Enterprise
Windows 8 (64-bit):	Standard, Pro, and Enterprise

Note: For Window 8 and 8.1, you must have the Microsoft KB2919355 installed on your machine.

Bentley does not support its software running on Microsoft operating systems versions that Microsoft has "retired". For more information on Microsoft's application retirement policy, click here. For similar information on Bentley products, refer to the Bentley Product Support article.

Software Prerequisites

The software prerequisites are included in the MAXSURF installer.

Supported i-model publishing engines

Publishing i-models from MAXSURF Modeler requires Bentley ItgDgnDbImporter 1.5.

Publishing i-models from MAXSURF Multiframe requires Bentley ISM

Microsoft Office

For reporting using Microsoft Word, this must be installed on the system.

Minimum Profile

The minimum recommended workstation profile for running MAXSURF CONNECT Edition is:

Processor:	Intel® or AMD® processor 1.0 GHz or greater. MicroStation is not supported on a CPU that does not support SSE2.
Memory:	4 GB minimum, 16 GB recommended. More memory almost always improves performance, particularly when working with larger models.
Hard Disk:	4 GB free disk space (which includes the 2 GB install footprint for a complete installation)
Video:	Graphics card which fully supports DirectX 11 and OpenGL with up to date drivers. A stand-alone graphics card with 512 MB of video RAM or higher is recommended.
Screen:	A resolution of at least 1024 x 768 or higher.

No Longer Supported or Delivered

Windows 7 support: Whilst MAXSURF software may well continue to function on Windows 7 with SP1, this operating system is no longer officially supported by Bentley Systems. Microsoft support for Windows 7 ended on January 14, 2020.

32-bit operating systems are no longer supported.

Quick Install Guide

Please refer to the separate installation guide document for information relating to downloading and installing MAXSURF.

Before you start the Installation

When installing or uninstalling this product, you must be logged on with Administrator rights.

It is highly recommended that you close any programs and disable any antivirus software that is running prior to the installation of this software. Be sure to turn on your antivirus software when you have finished.

Licensing

This version of MAXSURF uses CONNECT Licensing which replaces the older SELECT Licensing used by MAXSURF 21 and earlier versions.

The CONNECT Licensing is Bentley's new process for product activation and usage tracking, improving our licensing capabilities with features such as:

- **License alert notifications when you are approaching a custom usage threshold**
- **Replacing site activation keys with user validation, enhancing security around your Bentley licenses and subscriptions**

With traditional SELECT Licensing, product activation has been through an activation key that an Organization distributed to all users. With CONNECT Licensing, product activation is managed by user sign in through the CONNECTION Client, which is installed on each machine that uses Bentley applications. This offers a more secure and manageable system as it offers usage alerts, notifying your users when they are about to reach a certain usage limit set by the Administrator.

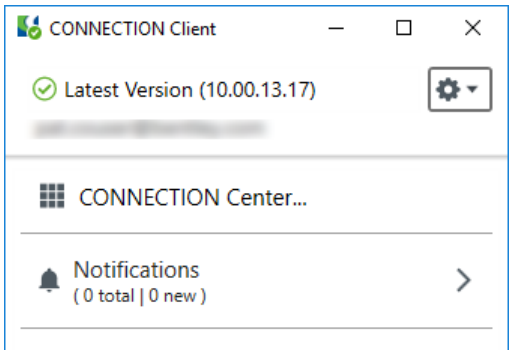
This product version uses CONNECT Licensing, which does not support SELECT activation key(s). CONNECT Licensing features new behavior to enhance your organization’s user administration and security with mandatory user sign-in via CONNECTION Client to access the application. If you are already signed in to the CONNECTION Client, you have met this prerequisite. If you have not, please refer to the Administrator's Resource Center and/or contact your administrator for assistance in the registration and sign-in process.

Detailed information is available at Bentley Communities Licensing and Activation Wiki:
https://communities.bentley.com/products/licensing/w/licensing__wiki/37813/connect-licensing
https://www.bentley.com/en/perspectives-and-viewpoints/topics/campaign/bentley-user-registration

For full details of Subscriptions and Licensing please visit
http://www.bentley.com/subscriptions

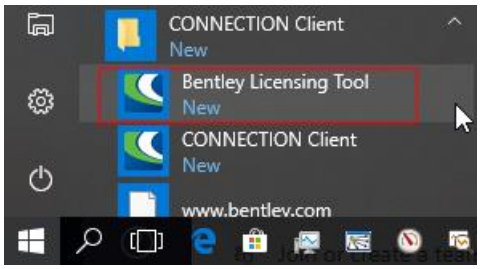
Signing in with CONNECTION Client

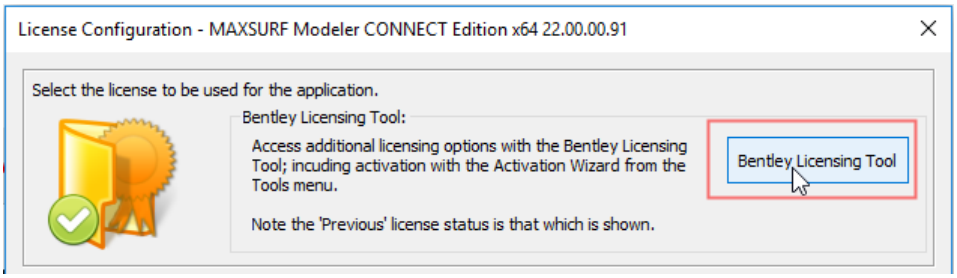
In general, you should be signed in with the Bentley CONNECTION Client to obtain a license and use the software. If you are signed in the real-time usage of the software is known, enabling license overuse and other notifications to work as designed.



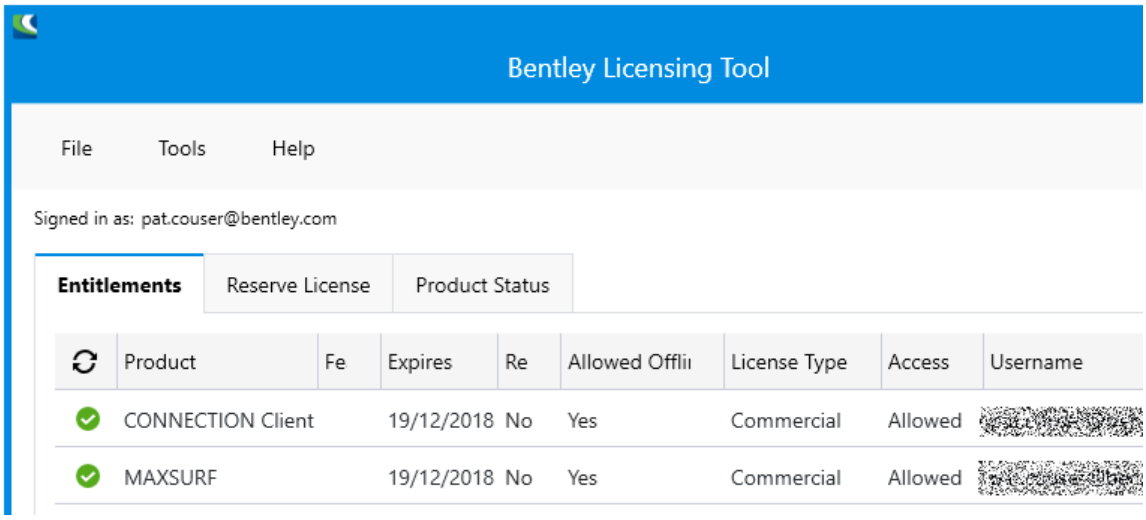
Bentley Licensing Tool

The Bentley License Tool can be accessed from the Start Menu or from the MAXSURF License Configuration dialog:



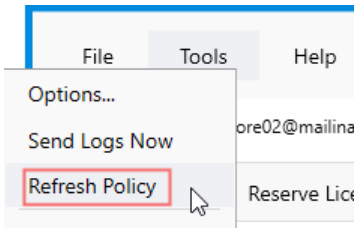


The Bentley Licensing Tool will enable you to see the status of the Bentley Software installed on your system. The products which you are entitled to use will be shown in the “Entitlements” tab in the Bentley Licensing Tool. Normally only recently used products will be displayed in the Entitlements; if you do not see the expected products it may be because they have not yet been used on the system. You can try to use and/or activate products even if they do not appear in the list, these products may then appear in the list once they have been used.



License Policy

If your administrator has modified your entitlements, then it is necessary to refresh the Policy. This is done with the Bentley Licensing Tool through the Tools menu:



You should then use the "refresh" icon to update the list of entitled products: ; under some circumstances it may be necessary to close and restart the Bentley License Tool to effect a full refresh of the policy.

Product Activation

Product activation will not normally be required, if you have entitlements to the product, you will be able to use it without the need to activate it first.

Evaluation

You will be given a grace period to use the software in trial mode, this will normally be a period of 7 to 30 days depending on the product.

Legal

Trademark Notice

Bentley, the "B" Bentley logo, MAXSURF, Multiframe, MicroStation and ProjectWise are registered or non-registered trademarks of Bentley Systems, Inc. or Bentley Software, Inc. All other marks are the property of their respective owners.

Copyright Notice

Restricted Rights Legend

Bentley Information

Services and Support Information

TechNotes, FAQs, and additional Bentley product information, can be found on the Bentley Communities Product Technotes and FAQs Wiki page.
http://www.bentley.com/ProductTechnotesAndFAQs

Log issues that you encounter with Bentley products using the Service Request Manager. This can be done from the application with the Help | Service Request Manager menu.
http://www.bentley.com/CreateNewServiceRequest

Support Path

Please go to the CONNECTION Center, and create an account if you do not already have one, this will enable you to take advantage of all the Bentley CONNECT features:
https://connect.bentley.com/

Full details of the features provided by Bentley CONNECT are described in the document BentleyCONNECTEditionOverview.pdf which is installed with MAXSURF.

Bentley Headquarters

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Phone: (+86) 10 5929 7000
www: http://www.bentley.com

Links

MAXSURF Information:	http://www.bentley.com/MAXSURF
Bentley Online Documentation:	https://docs.bentley.com/LiveContent/
TechNotes and FAQs:	http://www.bentley.com/ProductTechnotesAndFAQs
Bentley Communities:	http://communities.bentley.com/
Bentley SELECT:	http://selectservices.bentley.com/
Bentley Products:	http://www.bentley.com/products/
Bentley CONNECT:	http://connect.bentley.com/
Licensing and Subscriptions	http://www.bentley.com/subscriptions

Release Notes

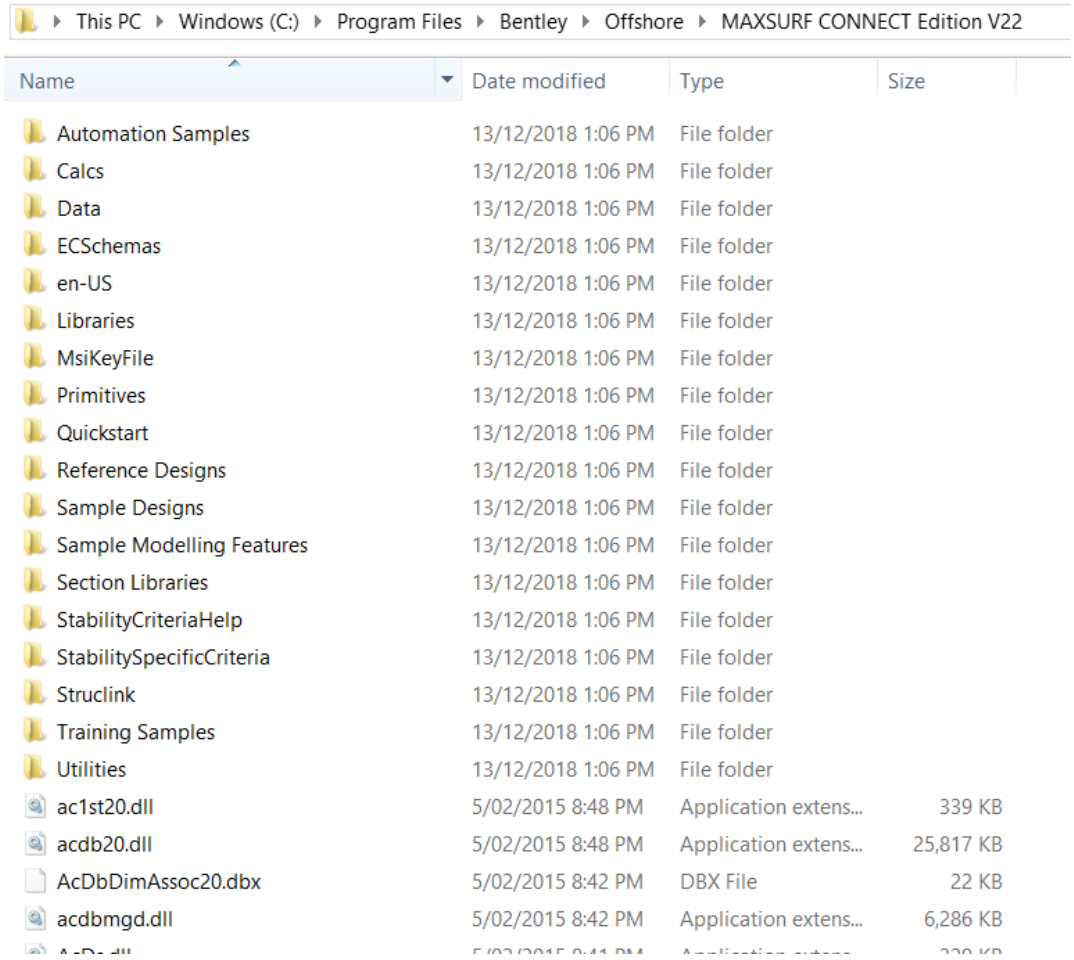
The following sections describe the changes which have been made to the MAXSURF modules.

Compatibility with Previous Versions

MAXSURF data files are forward and backward compatible between most versions of MAXSURF. Where backward compatibility has been broken, the option to export to earlier file formats is provided in the new version.

Directory Structure

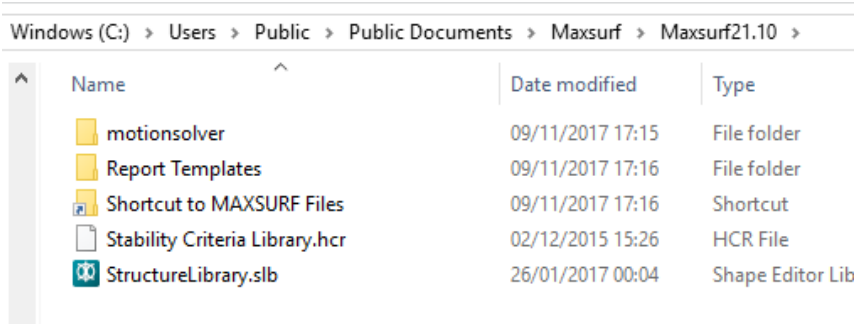
The main application executable files, manuals etc are installed in the root level of the folder selected for the installation. Folders containing sample models are also included.



Name	Date modified	Type	Size
Automation Samples	13/12/2018 1:06 PM	File folder	
Calcs	13/12/2018 1:06 PM	File folder	
Data	13/12/2018 1:06 PM	File folder	
ECSchemas	13/12/2018 1:06 PM	File folder	
en-US	13/12/2018 1:06 PM	File folder	
Libraries	13/12/2018 1:06 PM	File folder	
MsiKeyFile	13/12/2018 1:06 PM	File folder	
Primitives	13/12/2018 1:06 PM	File folder	
Quickstart	13/12/2018 1:06 PM	File folder	
Reference Designs	13/12/2018 1:06 PM	File folder	
Sample Designs	13/12/2018 1:06 PM	File folder	
Sample Modelling Features	13/12/2018 1:06 PM	File folder	
Section Libraries	13/12/2018 1:06 PM	File folder	
StabilityCriteriaHelp	13/12/2018 1:06 PM	File folder	
StabilitySpecificCriteria	13/12/2018 1:06 PM	File folder	
Struclink	13/12/2018 1:06 PM	File folder	
Training Samples	13/12/2018 1:06 PM	File folder	
Utilities	13/12/2018 1:06 PM	File folder	
ac1st20.dll	5/02/2015 8:48 PM	Application extens...	339 KB
acdb20.dll	5/02/2015 8:48 PM	Application extens...	25,817 KB
AcDbDimAssoc20.dbx	5/02/2015 8:42 PM	DBX File	22 KB
acdbmgd.dll	5/02/2015 8:42 PM	Application extens...	6,286 KB

MAXSURF installation folder

Some additional files are installed under the “Public Documents” folder. These include the reporting templates and libraries used by MAXSURF.



Additional files under the “Public Documents” folder

Changes: All MAXSURF Modules

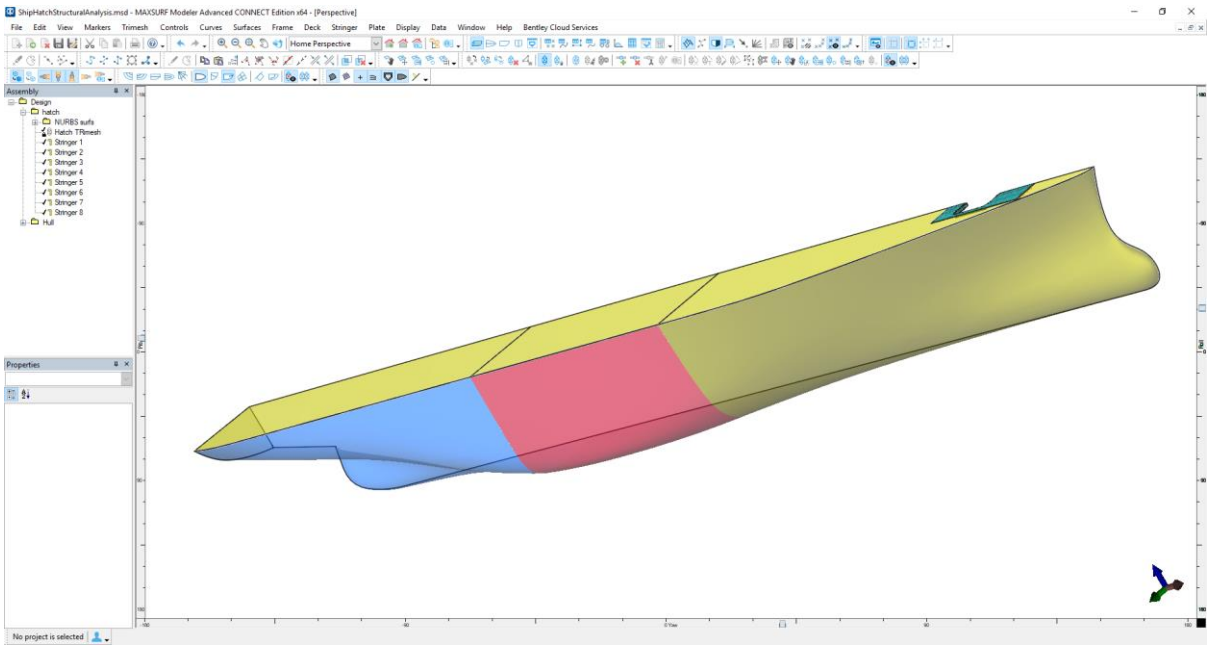
1022258: Structural Analysis within the MAXSURF suite – Technology Preview

The transfer of ship structural models from MAXSURF Modeler for analysis in MAXSURF Multiframe is currently in *Technology Preview* phase. This means that it is not fully tested and it is possible that users may find issues previously unknown to the development team; however it is included in this release so that you can comment and provide feedback on these new features. The team kindly request that users provide feedback via the Bentley Support link located in the Support tab of the ribbon. These features should be used with caution.

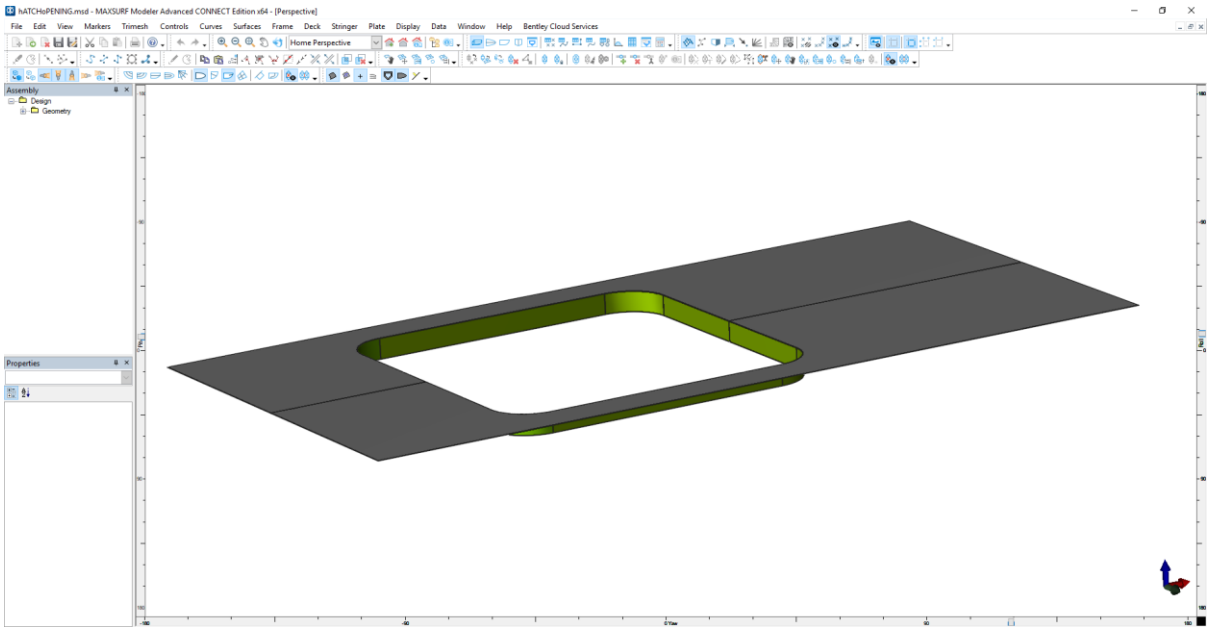
With improved meshing and data transfer from MAXSURF Modeler and MAXSURF Multiframe, it is now quick and easy to do initial structural analysis, either globally or locally on your design. The following example illustrates the workflow:

1. **Model the structure in Modeler using NURBS surfaces**
2. **Generate trimeshes on structural parts**
3. **Assign section shape to stringers**
4. **Bond stringers to trimeshes**
5. **Export to Multiframe text file format**
6. **Import into Multiframe**
7. **Assign loads**
8. **Run analysis**

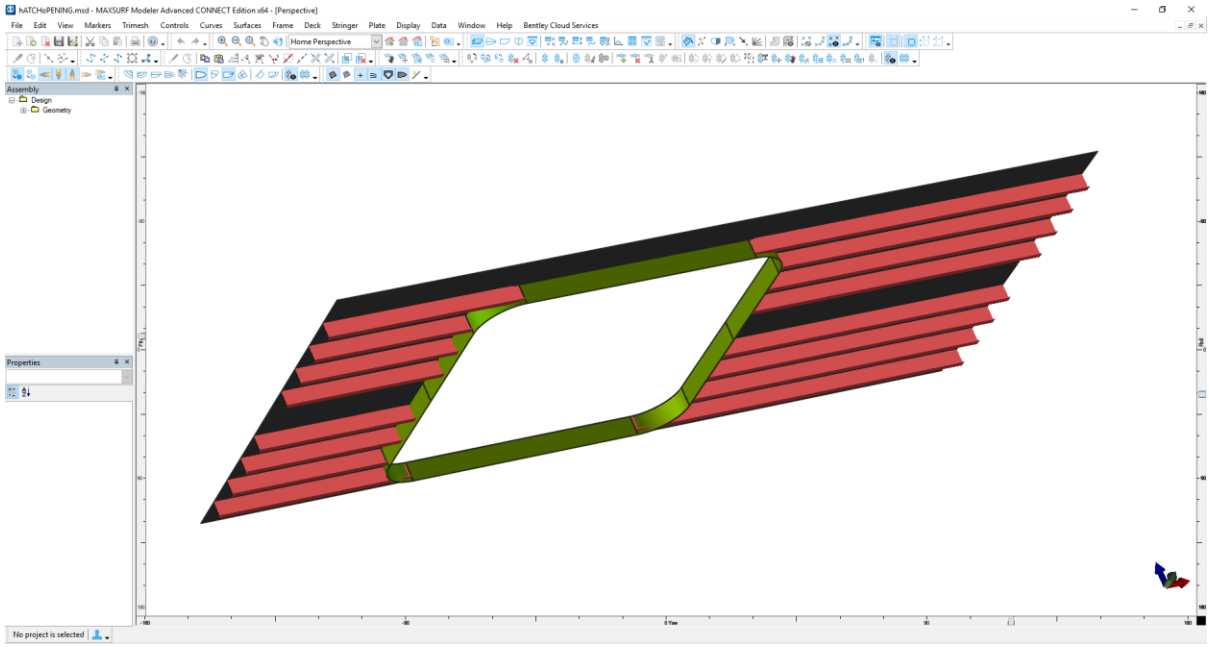
In this example, the deck structure from around a hatch is going to be exported for structural analysis in Multiframe. Here is an image of the complete vessel:



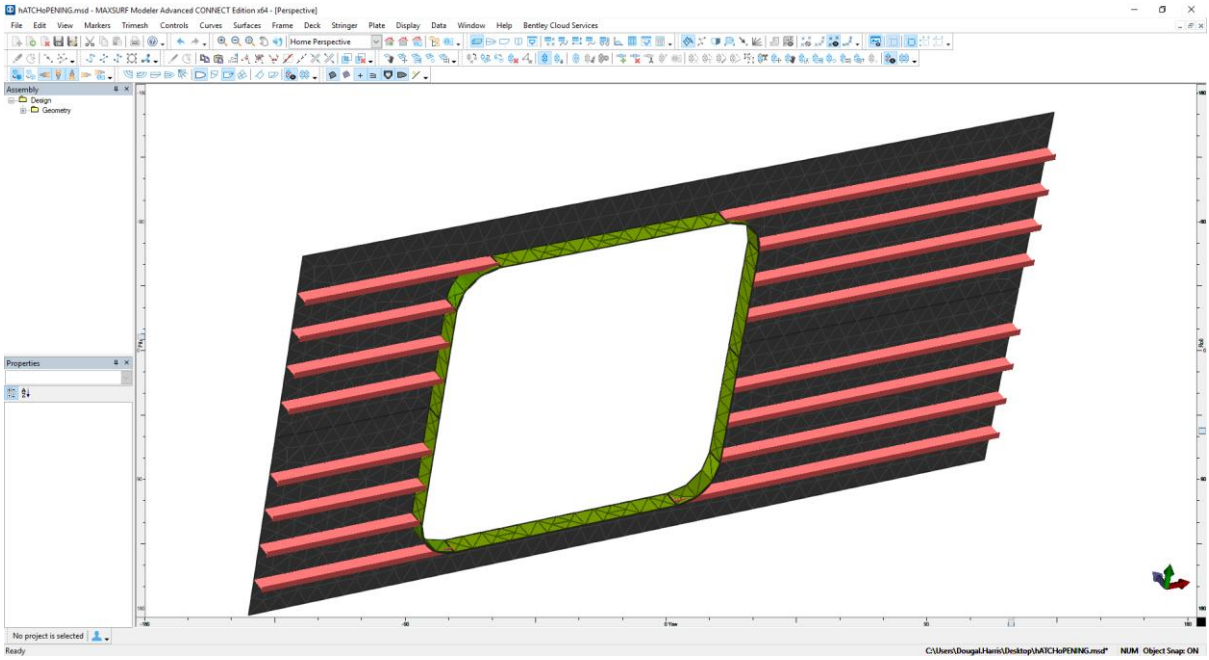
The NURBS surface model of the geometry in the area of interest (hatch at bow):



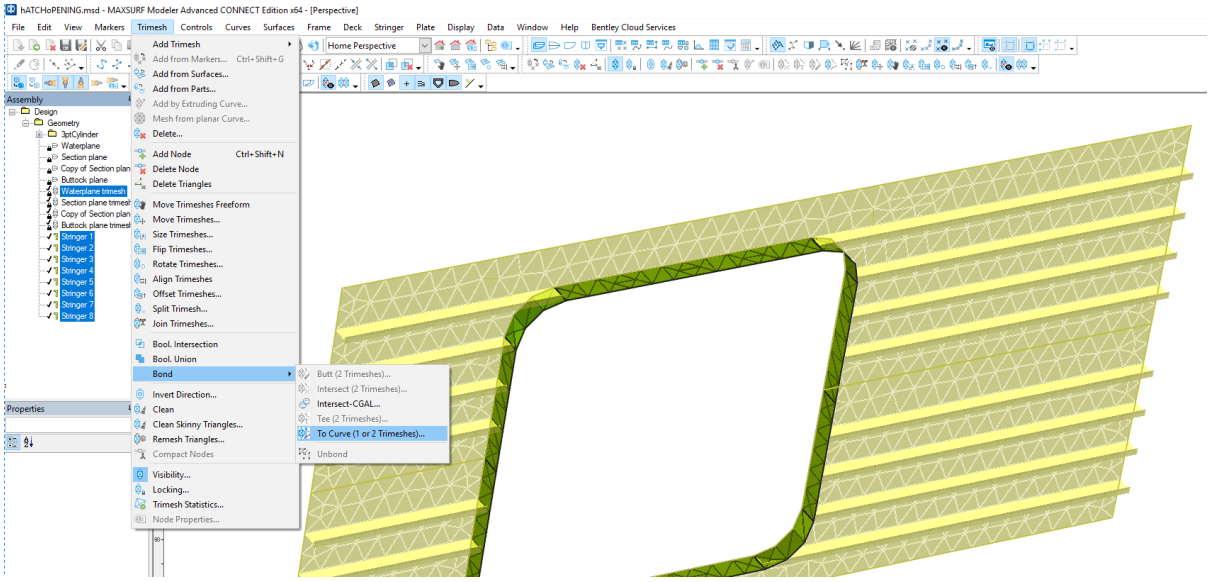
A series of longitudinal stringers with T cross section is added to the underside of the deck:



A trimesh can then be added on each of the NURBS surfaces:



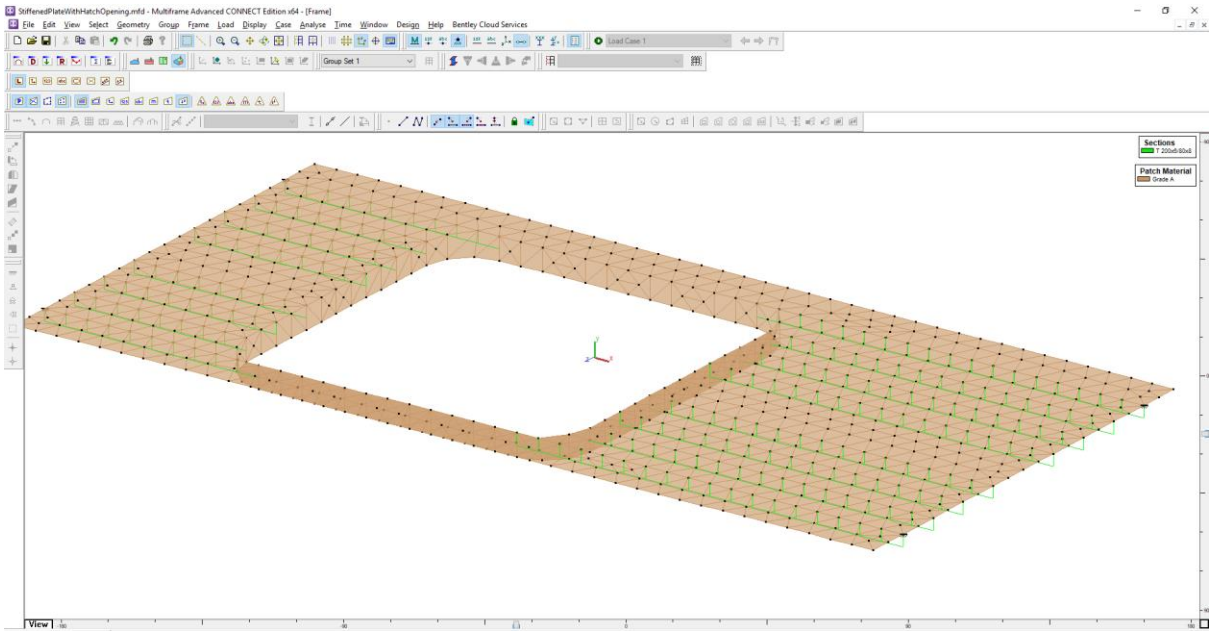
The triangle nodes of the trimesh do not necessarily coincide with the stringer nodes, to achieve this the trimeshes are “Bonded” to the Stringers using the “Bond to Curve” command:



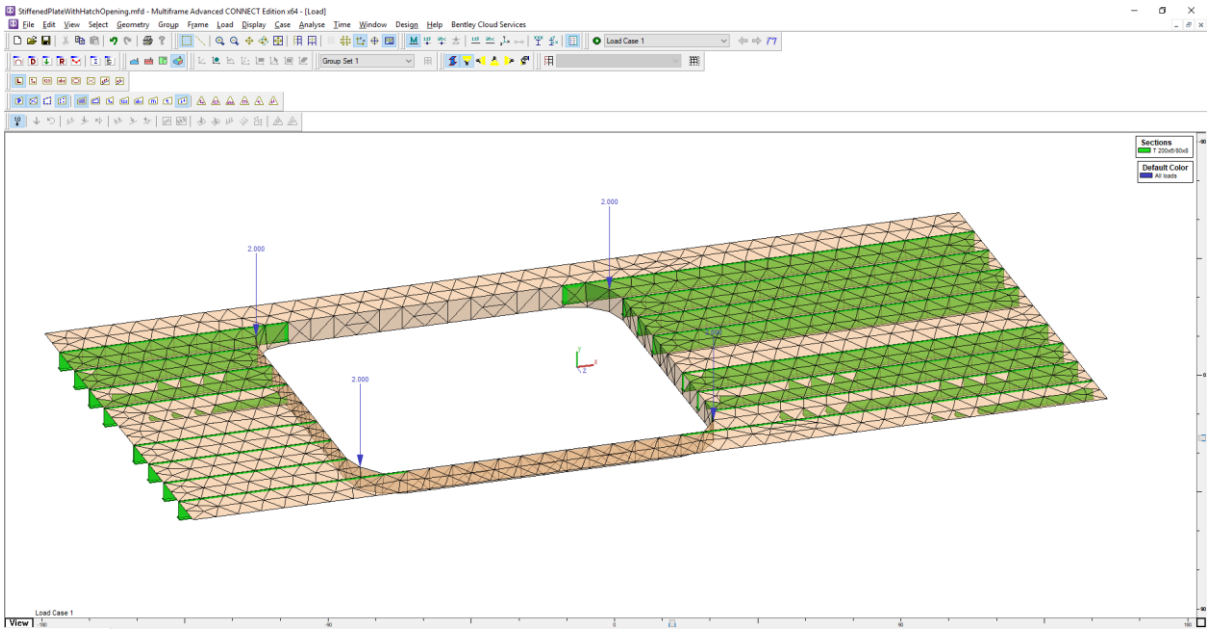
Once the structure geometry has been created then each part to be exported needs to have a material assigned (trimeshes and stringers). To export the model to Multiframe simply choose “File | Export | Trimeshes | Multiframe text file…” from the menu.

Before importing the file into Multiframe, ensure that you have the same library (*.slb) as used in Modeler to create the model loaded.

From the menu choose File | Import | Multiframe Text… and select the file you just saved from Modeler:

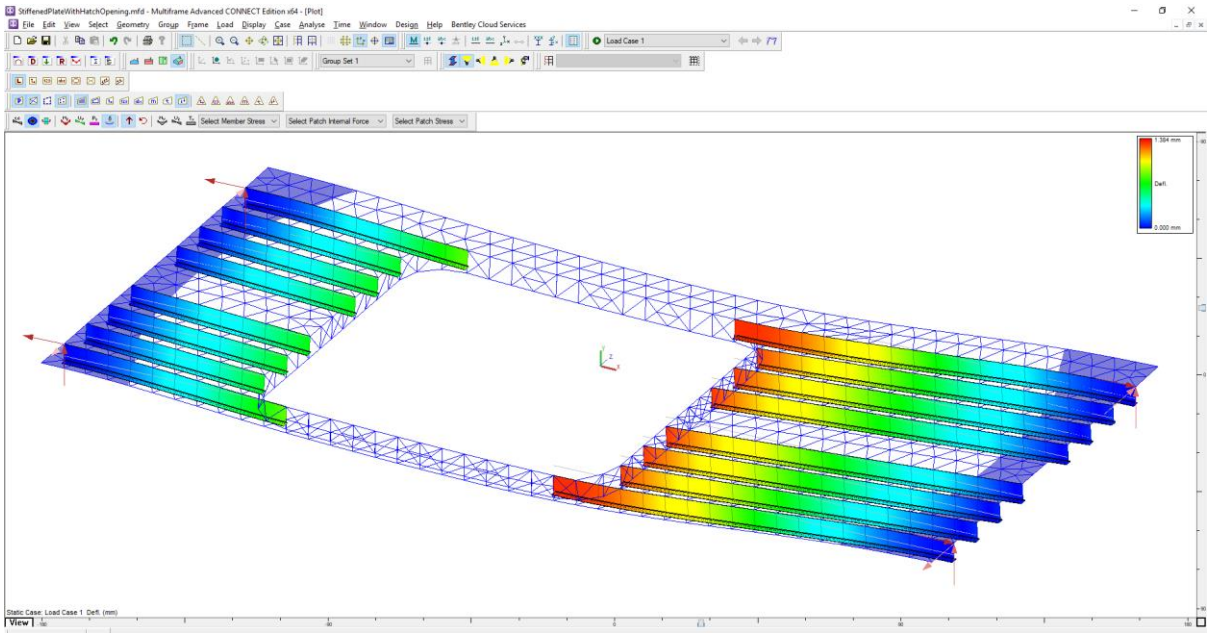


Before an analysis can be performed, the restraints and loads need to be applied. In this case we will apply a simple load of 5kN at each of the four corners of the hatch:



A Linear analysis of the structure can now be performed by choosing Analyse | Linear from the menu.

Results can then be viewed either in graphical or tabulated format. The following image shows the deflection of the stiffeners and reaction forces at the restrained nodes:

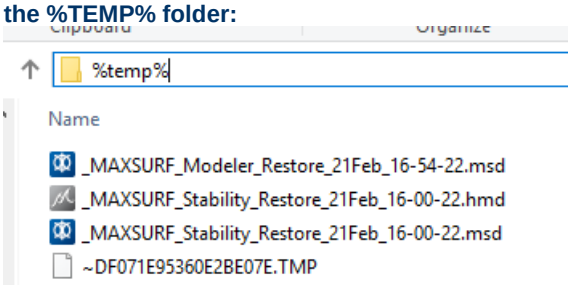


The results can also be sent to a report or animated for presentation.

This workflow can be followed for a global analysis of an entire structure or for other local regions of structure for detailed analysis.

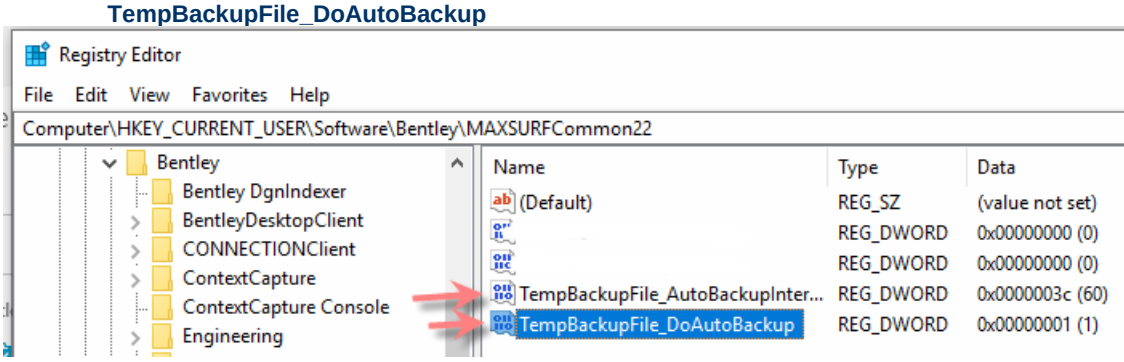
Bug fixes and minor changes

- **1060502: Evaluation and Trial licenses are differentiated in the Help | About > Sys Info. dialog. Evaluation licenses must be specifically requested and typically valid for 30 days; trial licenses allow the software to work for the first 7 days of use without the need for activation.**
- **1050044, 1030356: A crash which could occur on startup with some very slow computers has been fixed.**
- **1028035: Application log files (if generated) are now time-stamped and saved in the %temp% folder.**
- **948698, 938158: Auto saved files have been added for most of the MAXSURF Modules. In the event of an unexpected crash, these restore files can be found in the %TEMP% folder:**



This feature may me disabled or the Auto-save interval adjusted using the following Registry settings:

TempBackupFile_AutoBackupIntervalSeconds
TempBackupFile_DoAutoBackup



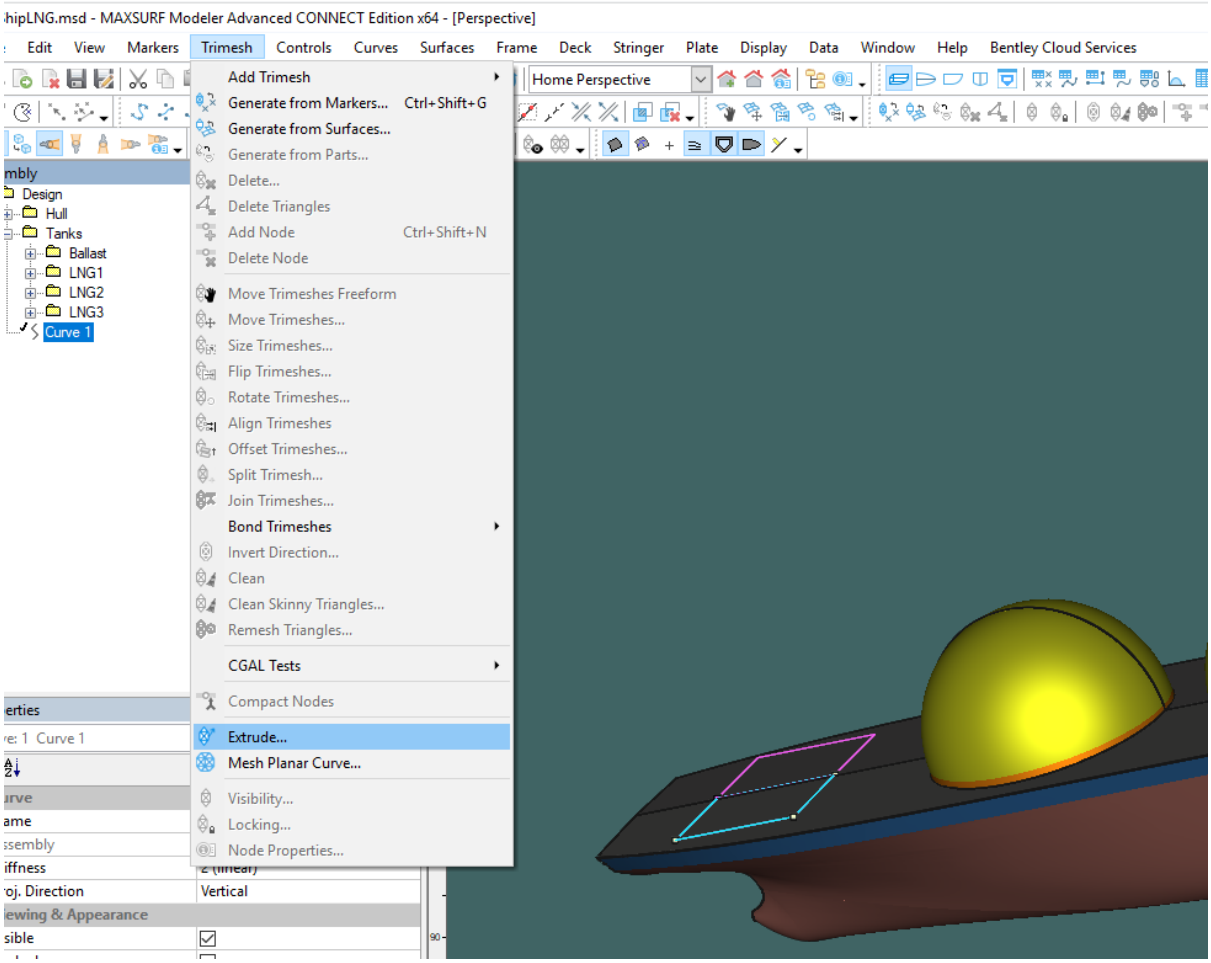
Changes: MAXSURF Modeler

1074612: Save vs SaveAs

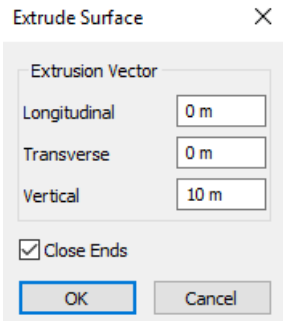
Now Save, in any window in Modeler will save the whole model with the current file name as a .msd file. To save the data in individual windows, you must always use Save As. To save the whole model in a new file, you must use Save As from one of the model drawing windows. (Previously Save would save only the contents of the top window; hence the whole model was saved only when one of the drawing windows was active if the Save command was used.)

1069090: Extrude Trimesh function

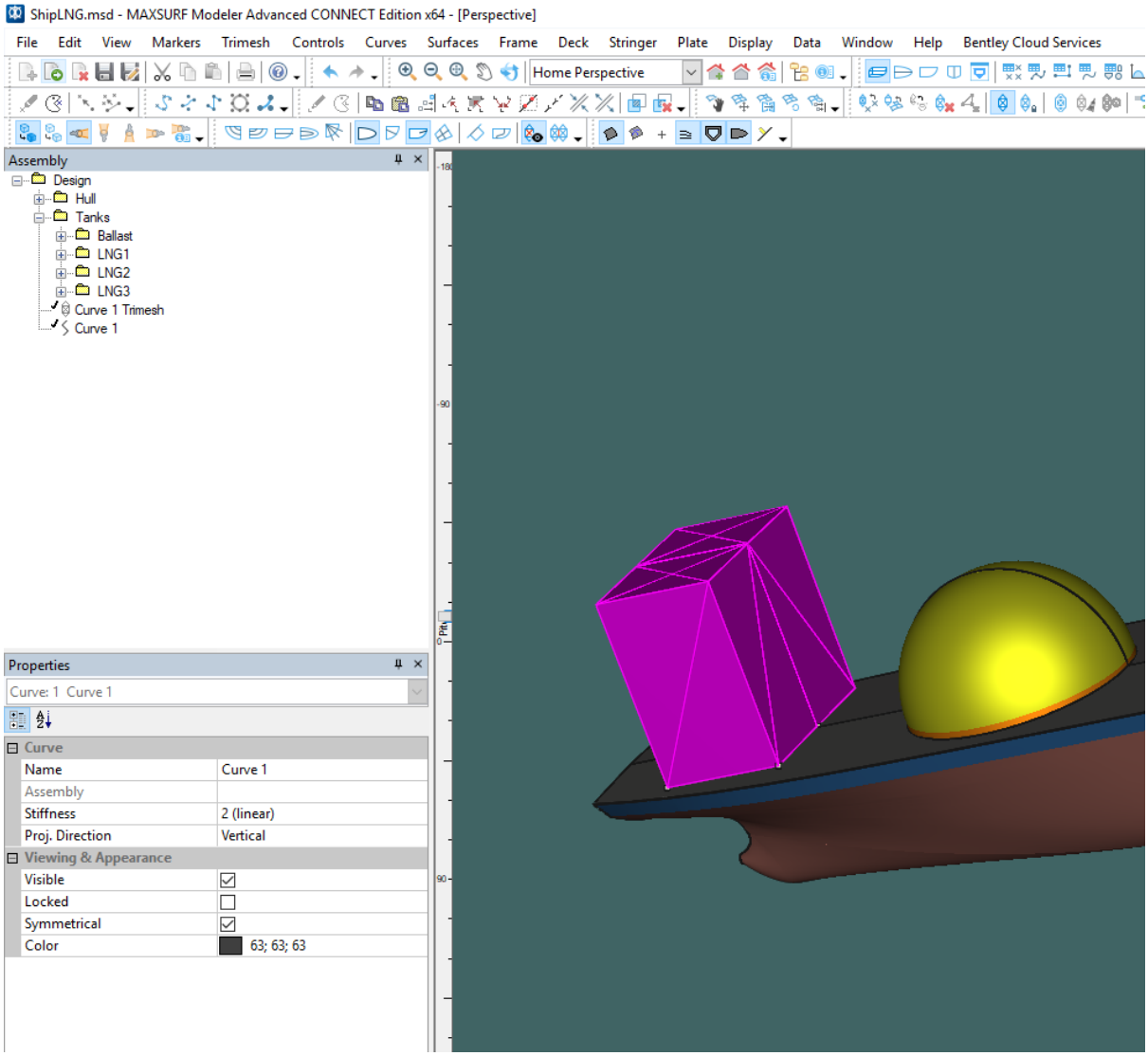
A trimesh can now be defined by extruding a curve along a vector, similar to the function for extruding a NURBS surface from a curve. The function is in the Trimesh menu called "Add by Extruding Curve…" :



The function is enabled when a curve is selected, the following dialog will then appear:



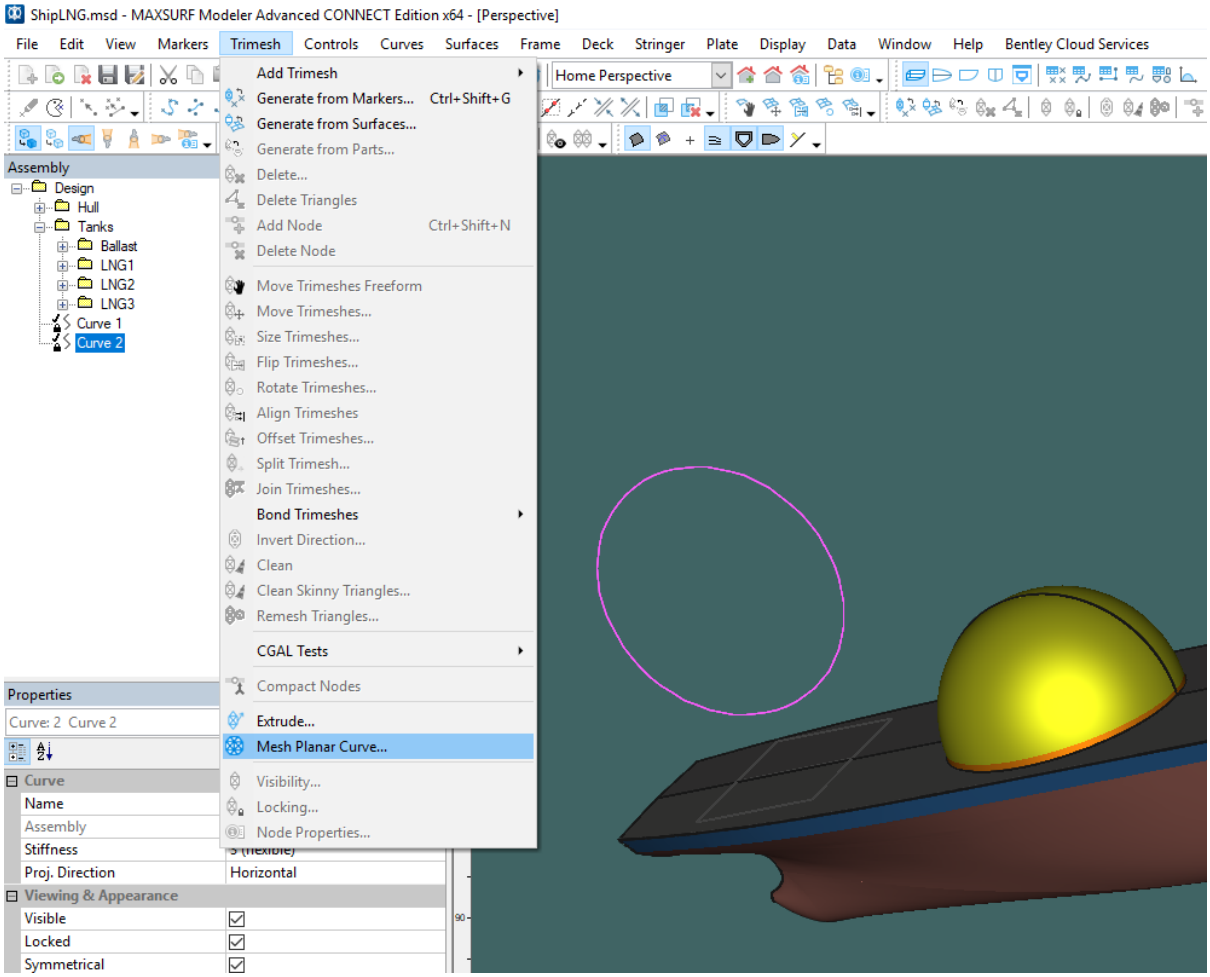
Enter the extrusion vector and whether or not you want the ends to be meshed to create a closed voume ("Close Ends"), click ok:



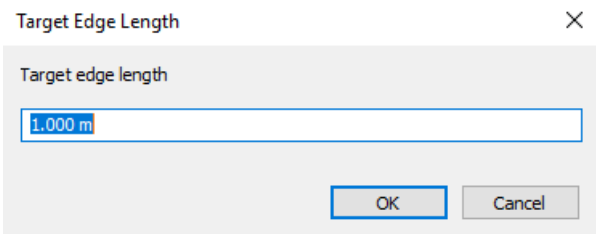
In the case of a linear curve being extruded the simplest trimesh possible will be created. To create a denser trimesh use the remesh command and you will be asked for a target edge length, the trimesh will be remeshed to this specified density.
If a NURBS curve is chosen to be extruded, the process is the same except that the user will be asked to specify a target edge length for the triangle edges along the chosen curve.

1069090: Create trimesh from planar curve function

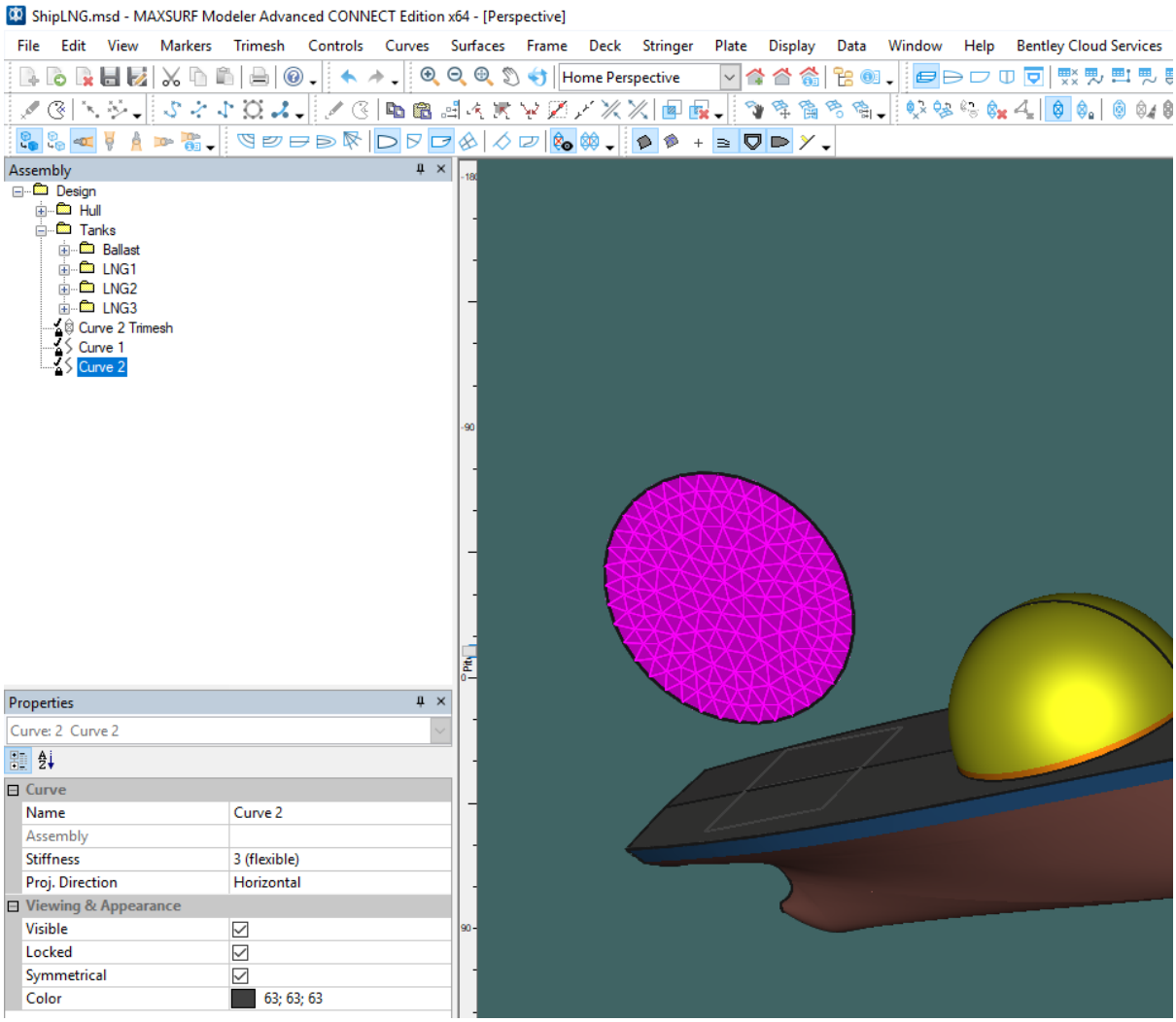
A trimesh can now be created from a planar curve. The function is available from the trimesh surface when a planar curve is chosen (all points on the curve must lie in a plane):



If the curve is a NURBS curve the user will be asked to specify the target edge length along the boundary:



The curve will then be meshed at that density. If the curve is not closed then MAXSURF will close it with a linear segment between the first and last points.

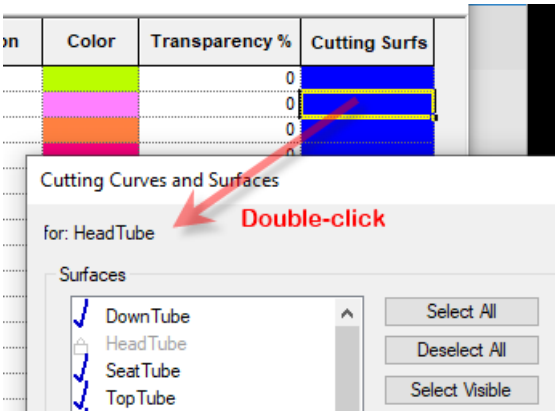


If the chosen curve is linear then the simpliest trimesh possible will be created. If a denser mesh is required, select the mesh and remesh, the user will then be asked for a target edge length.

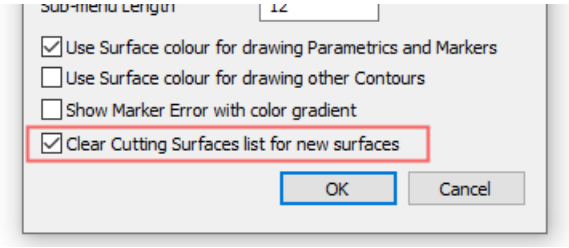
1068082: Cutting Surface/Curve list

We have noticed that models are becoming more and more detailed with more and more surfaces included in the models. When using surface trimming, it is much easier if only the desired cutting surfaces and curves are selected for each surface.

In previous versions of Modeler, the default behavior was to have all surfaces included in each surfaces' cutting list. We have changed this so that the default is that no surfaces are added to the cutting list. You must manually select which surfaces and curves should be used, this can be done in the Surfaces table, Property sheet or dialog.

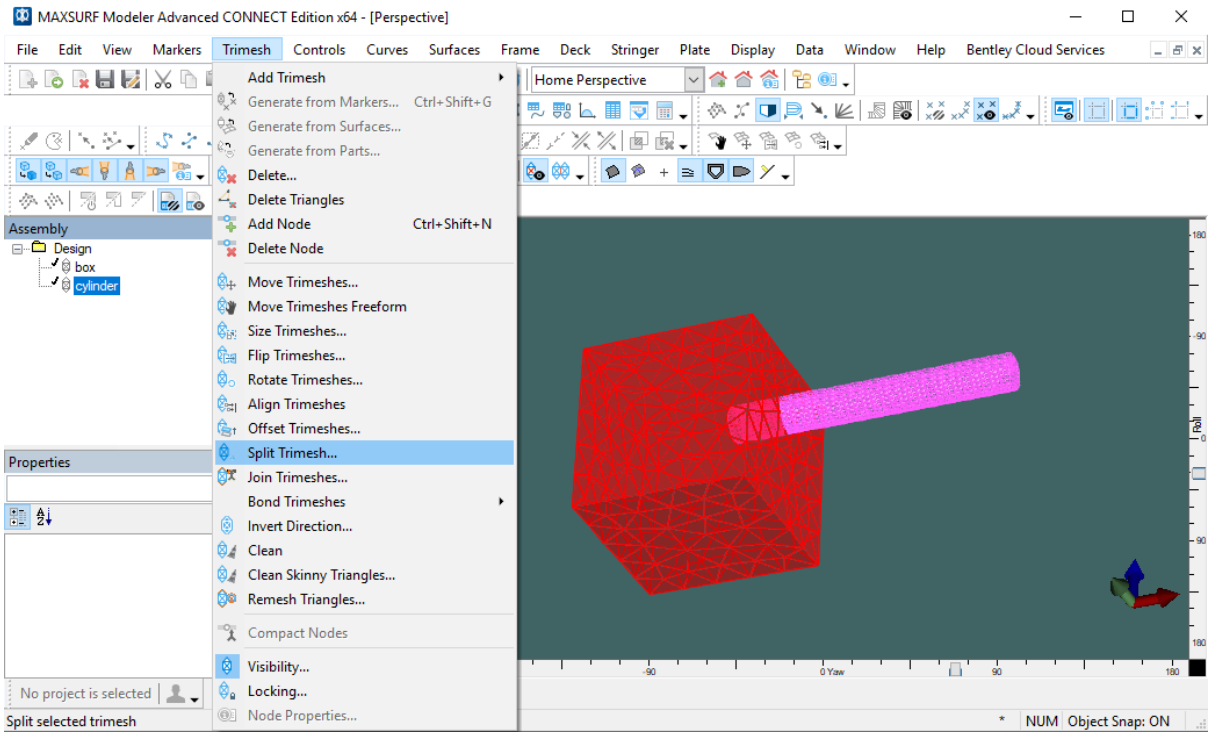


If you wish to revert back to always adding all surfaces to the cutting list, this can be done in the Edit | Preferences dialog:

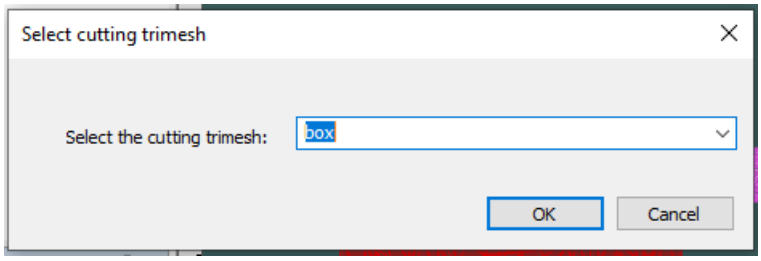


1060082: Split Trimesh command

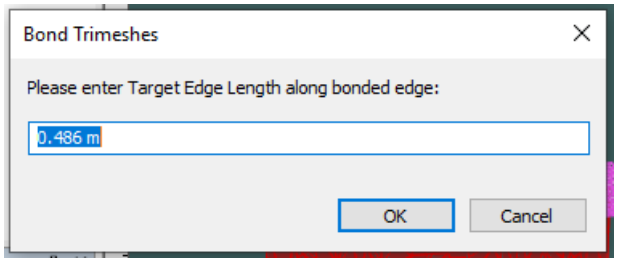
Trimeshes can now be split into regions by a cutting trimesh surface. To split a trimesh select the trimesh in the assembly tree and choose "Split Trimesh" command from the Trimesh menu:



You will then be asked to select a cutting trimesh:



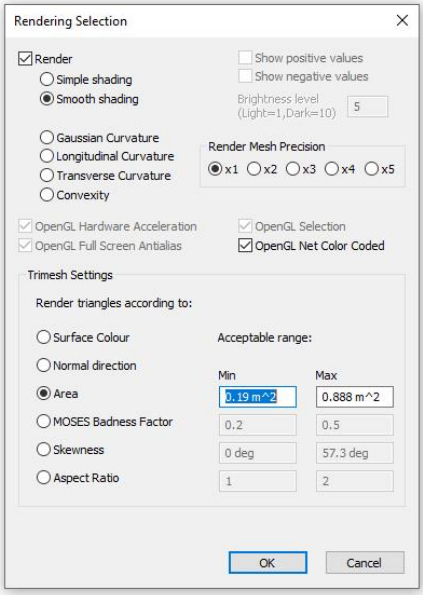
Next you will be asked to set the target edge length for the triangles along the intersection, the default is set to the default of the parent trimesh:



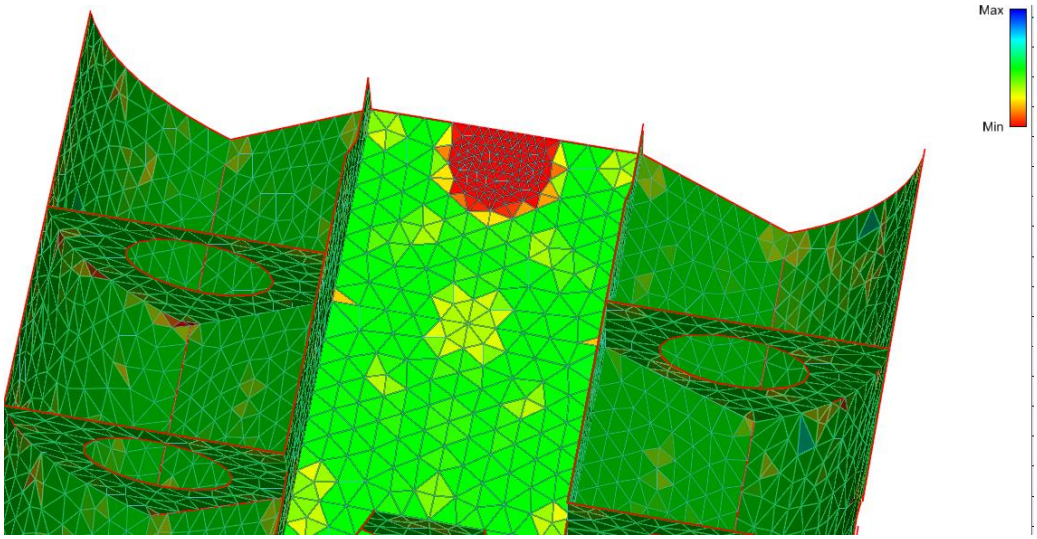
The parent trimesh will then be split into a number of trimeshes according to how many regions were formed by the cutting surface. Properties for the child trimeshes will be inhereted from the parent trimesh.

1052524: New tools for assessing mesh quality

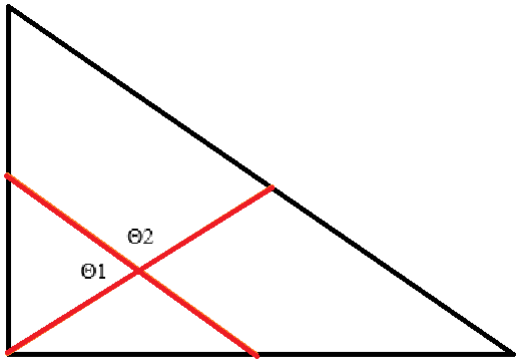
Whether you are meshing for FEA or hydrodynamic analysis, the quality of the mesh used is important. We have added some new tools to help quickly assess the quality of your mesh.
Using the render dialog there are new options in the trimesh group:



‘Skewness’ and Aspect Ratio have been added along with the option to set a minimimum and maximum allowable value for these as well as Area and MOSES Badness factor. Any triangle that falls within the accepatble range will be coloured green with trianlges outside this range being shaded according to the legend:



This gives a quick visual reference as to which area(s) need to be worked on and how severely the triangles are outside the acceptable range the user has set. The rendering is updated in real time as the triangles are manipulated giving feedback on their quality. Skewness gives a mesure of how ‘skewed’ the triangle is. The definition chosen can be seen below:



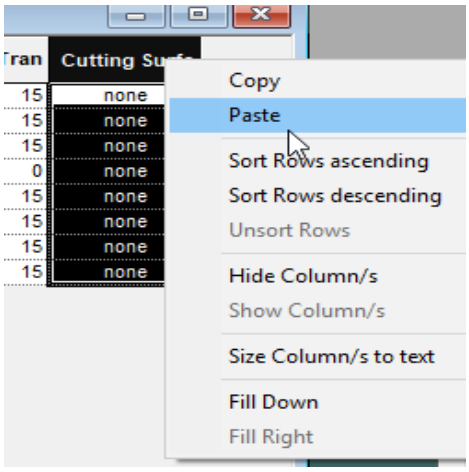
- **Draw a line from each node to mid point of its opposite side, Draw another line joining mid-points of other two sides measure the angles between two lines. Repeat the step for all the three nodes and find all six angles (Θ1 to Θ6).**
- **Skewness (in degrees) is calculated by subtracting minimum angle from 90:**
- **Skewness= 90-min(Θ1, Θ2...Θ6)**
- **The triangle aspect ratio definition chosen for Modeler is:**
- **Aspect Ratio = the circumradius to twice its inradius, so AR = abc/(8(s-a)(s-b)(s-c)) where a,b,c are the lengths of sides of the triangle and s = (a+b+c)/2.**

1050346: Update All Cutting Lists and Surface Colors

A way of quickly updating the cutting surface list has been implemented. Normally the Cutting list dialog (double clicking a cell in the Cutting Surface column in the Surface Properties table) is used to select the cutting surfaces and curves for a single surface, to update the cutting list for many surfaces this is quite a laborious process. Some common selections can now be made by typing or pasting a value into one or more cells (because it is not possible to double-click to start editing, use the F2 key (as per Microsoft Excel):

- **I : Intersecting surfaces selected**
- **AI: All surfaces selected**
- **N: No surfaces selected**
- **V: Visible surfaces selected**

To update the Cutting list of several surfaces together, copy the appropriate characters (above) to the clipbord, then paste into the selected cells. For all surfaces: select the column by clicking into header and use Ctrl+V (or right-click Paste)



In the same table, a similar feature has been added for specifying surface colors, use the following letters:

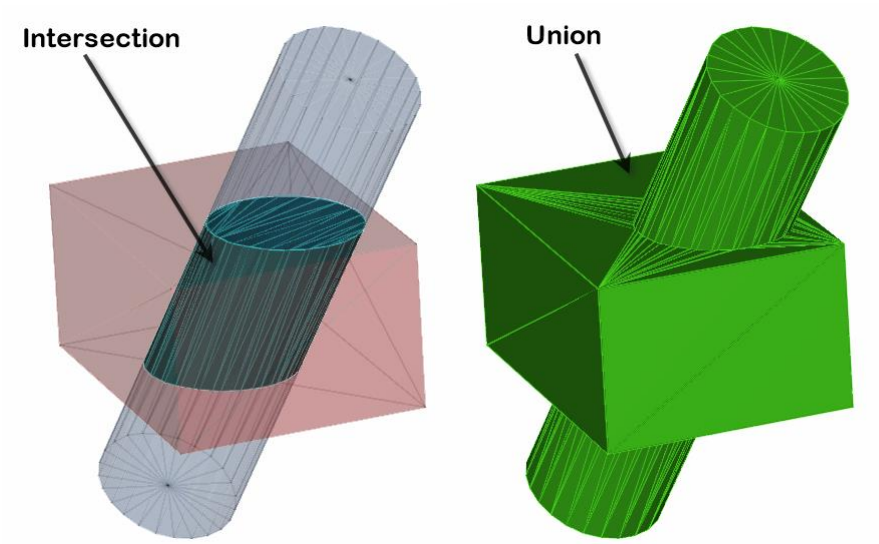
- **R: Random**
- **S: Series**

1048438: Boolean operations for closed Trimeshes

Several Boolean operations which may be applied to closed trimeshes have been included in this version. Two or more closed trimeshes may have Boolean operations applied. The two operations which may be performed are:

- **Union: the single volume created by joining all selected trimeshes together**
- **Intersection: the volume common to all selected trimeshes**

For instance:



Boolean Intersection and Union of box and a cylinder trimeshes

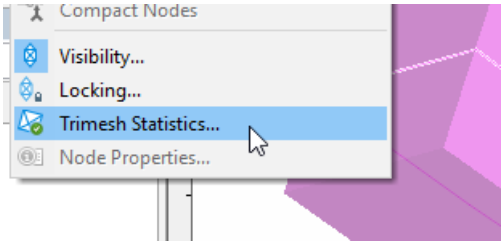
In a ship allocation:

Union might be used to create a single trimesh of a vessel from multiple individual trimeshes modeling the hull and wheelhouse.

Intersection might be used to create a tank trimesh by finding the volume inside the hull limited by a simple bounding box which may extend beyond the hull.

Detailed Trimesh Statistics

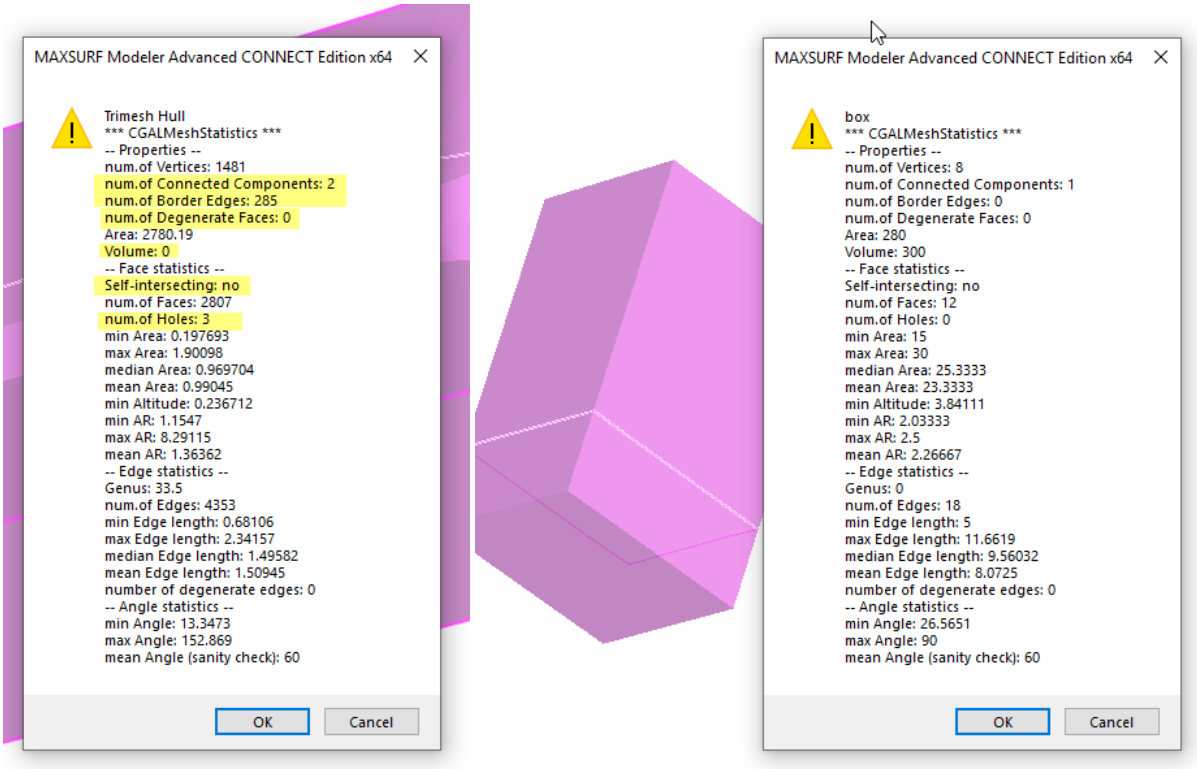
If the Boolean operation fails, verify that the trimeshes are closed without degenerate faces. Detailed statistics are calculated for the selected trimesh by selecting Trimesh Statistics from the Trimesh menu (select the trimesh in the Assembly, or in rendered mode, by clicking on the actual trimesh):



Show detailed statistics for the selected Trimesh

To determine if the trimesh is properly closed and is suitable for Boolean opertions verify that:

num.of Connected Components	=	1
num.of Border Edges	=	0
num.of degenerate faces	=	0
Volume	>	0.0
Self-intersecting	=	no
num.of Holes	=	0

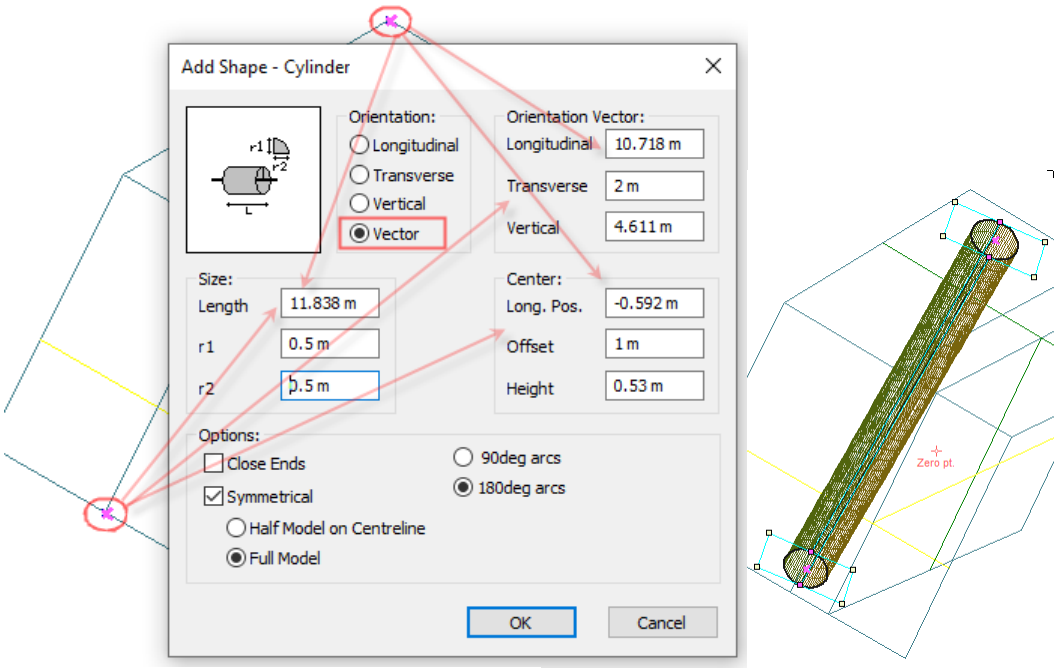


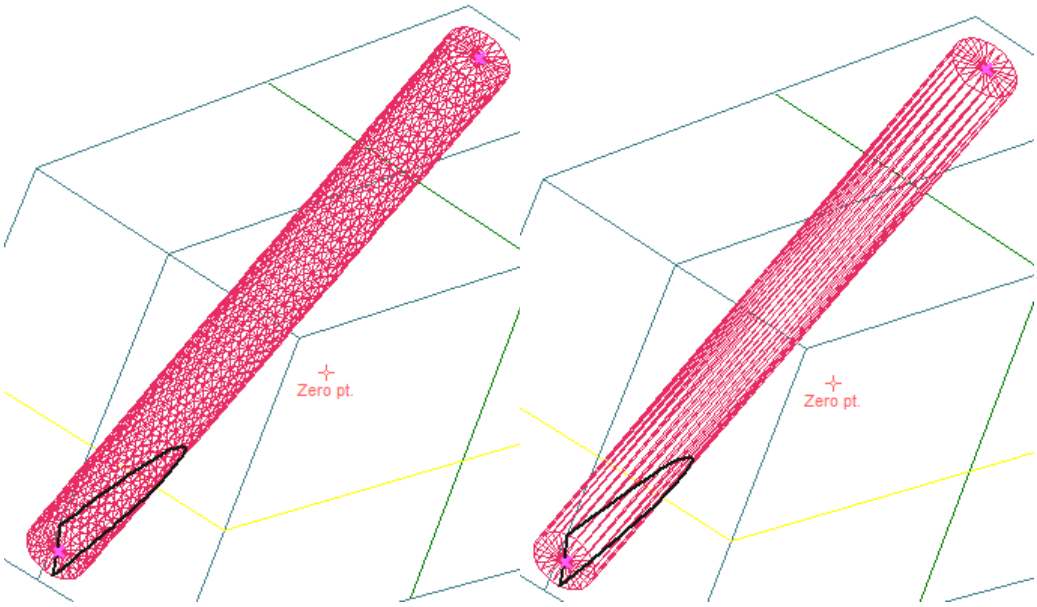
Bad(left) and Good (right) statistics for Trimesh which is suitable for Boolean operations

1048436: Standard shapes for NURBS and Trimesh surfaces

When adding one of the standard shapes such as a box or cylinder, it is possible to specify:

- **Shape center (rather than defaulting to model center always)**
- **Shape orientation other that along one of the principle axis directions.**
- **Orientation, center and length will be set automatically if you first select two marker points which define the ends of the shape.**





For trimeshes holding down shift key when clicking the OK button in the dialog will result in a single triangle along the whole length of the cylinder (right)

Bug fixes and minor changes

- **1080000 A crash which could potentially occur after using the Join Trimeshes command has been fixed.**
- **1075391, 1040202: Line thickness is now used correctly for Frances, Decks and Stringers. Furthermore deck color is now saved properly if the deck has no openings.**
- **1075366: Inclined frames now use the selected surfaces rather than the visible ones.**
- **1071983: Pull-downs in the Properties sheet for surfaces now work more reliably.**
- **1076596: Inclined frame not forming correctly. Model Specific. Fixed.**
- **1075171: Remove stringer visibility link to surface visibility. Stringer visibility is now only a function of its individual visibility flag.**
- **1069082: The Surface field in the Markers Property pane now displays the correct surface name when several Markers are selected.**
- **1068082: Cutting surfaces are now off by default. This is a registry settings so will only be changed for fresh installs or after rest of registry settings (holding shift down on starting of application).**
- **1068081: An issue that caused linked NURBS surface data to be copied to the new trimesh during a Duplicate trimesh command has been fixed.**
- **1065358: In rare cases a frame might not render correctly due to duplicate points in the contour. Fixed.**
- **1065129: The .wsd file is now also saved with the .msd file during a restore file save.**
- **1064201: Materials from the section library can now be assigned to trimesh surfaces.**
- **1063605 and 1063609: Trimming regions not forming correctly on Linear surface or when a linear surface is in the cutting surface list. Fixed.**
- **1060270 Trimesh vertices have been added to list of snap objects available in drawing settings.**
- **1060082: Remesh triangle patch across bond now retains bond at new target edge length.**
- **1060079 Selection of individual triangles in rendered mode is now possible.**
- **1060078: Surface of revolution sometimes not working when pick option chosen.**
- **1059874: Deck data sheet has data for deck limits in wrong columns. Fixed.**
- **1059117: Edge and Inclined section highlighting now works correctly for asymmetrical surfaces.**
- **1057611: A problem which caused cutting surfaces and surface trimming to become corrupted has been fixed. This occurred with some specific models when editing the surface properties of one surface, the trimming of a different surface would become lost or corrupted.**
- **1057588: Trimesh selection not working correctly for rendered trimeshes with no edge contour. Fixed.**
- **1057428: When duplicating a trimesh the internal IDs of triangles were getting duplicated. This meant that subsequent operations on the new triangles could have unintended consequences. For example, selecting and deleting a set of duplicated triangles may have deleted the incorrect triangles.**
- **1056162: A crash which sometimes occurred with specific models when undoing a delete of multiple selected objects of different types has been fixed.**
- **1056157: A crash which sometimes occurred with specific models when deleting multiple selected objects of different types has been fixed.**

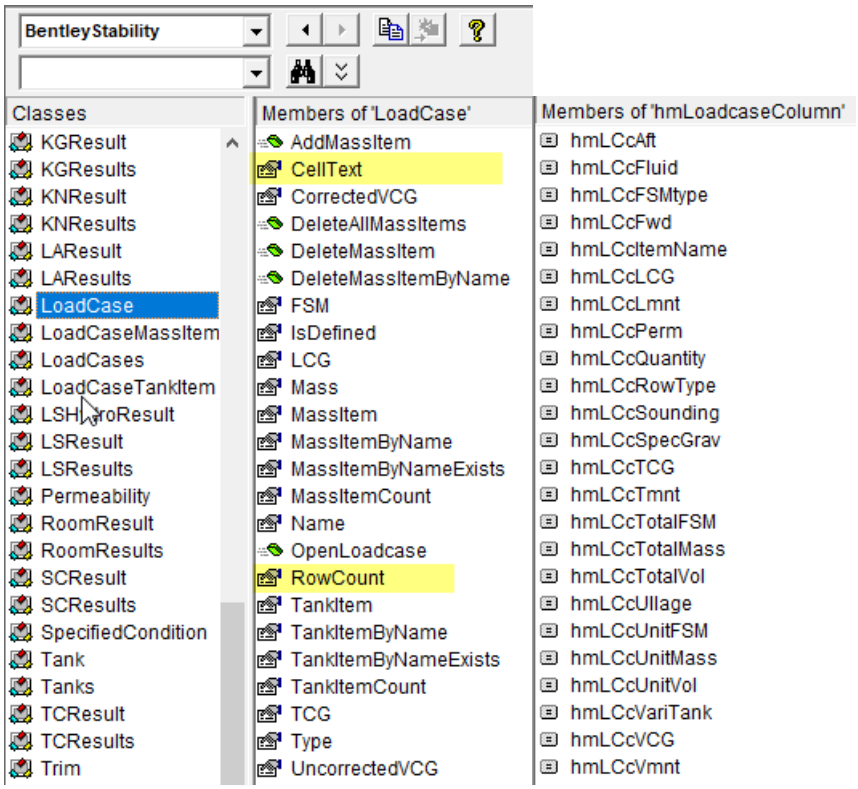
- **1055342: If a design is opened with structural parts (ie has a .wsd file associated with the .msd file) and all parts are deleted, then the model is saved the wsd file needs to be deleted too. A backup of the original .wsd file is made in the original location with timestamp.**
- **1055080: Strange rendering of Gaussian curvature which occurred under some specific conditions has been fixed.**
- **1052523: The triangles remesh function can now be executed on several different trimeshes at the same time.**
- **1052521: Crash on add stringer on bonded edge. Fixed.**
- **1048437: it is now possible to export Trimeshes in OFF format.**
- **1047179: Extended "Add Stringer on Contour" functionality to all selectable contours.**
- **1049653: Display warning if stringer section shape not found in library when opening a design.**
- **1046775: Move all Section Library editing functionality from Modeler into MAXSURF Shape Editor application. See the Shape Editor section below for more information.**
- **1041044: Crash on trying to remesh with only one triangle selected. Fixed.**
- **1040504: Exporting a DXF Lines after doing a 3D DXF export could result in an incorrect layout of the lines plan in the dxf file. Fixed.**
- **1034908: A 2mm tolerance is applied when compacting trimesh nodes for export to Multiframe**
- **1034898: Crash on import rhino 3dm file. Model specific. Fixed.**
- **1032390: Trimeshes formed from rider-bars on frame openings now have nodes coincident with those defining the frame.**
- **1031239: Crash on split surface. Model specific. Fixed.**
- **1031009: Static text clipped in Frame Opening dialogs. Fixed.**
- **1030694: The Mesh Parts dialog is now a Tabbed dialog.**
- **1030364: Crash on open .msd file. Model specific with certain trimeshes. Fixed.**
- **1029818: Incorrect logic in the surface rotation dialog when selecting bonded surfaces has been corrected.**
- **1027792: Trimesh OFF format import is more tolerant if there are blank lines in the file.**
- **1027163: A problem with IGES export of some models which caused the 72 character line limit to be exceeded has been fixed.**
- **1026893: The export options in the IGES/DXF dialog are now all remembered.**
- **1026633: Stringers are now included in the Generate Mesh from Parts dialog.**
- **1026061: Remove 'on the fly' meshing export options. With new improved meshing workflow is now: first, mesh all parts in Modeler then export trimeshes.**
- **1025440: Crash on load file with plates that do ot have an associated surface, model specific. Fixed.**
- **1024635: Crash on open 3dm file with all surfaces completely trimmed away. Fixed.**
- **1024359: Crash rotating trimesh, model specific, fixed.**
- **1022257, 1011615: Rhino version 6.0 files can now be read and written. The Rhino6 .3dm file format is now supported for NURBS surface and curve objects.**
- **1020167: Adding shapes with multiple NURBS surfaces now have all surface normals pointing outwards.**
- **1019018: Incorrect shift in zero point when loading a dgn file on top of an already open msd file. Fixed.**

- **1012638: Ensuring surface manipulations dialogs do not allow alterations to locked surfaces.**
- **971595: WAMIT mesh files (.gdf) which include quad elements will have them split automatically into two triangles along the shortest diagonal.**
- **867307: Frame on inclined section not getting rendered correctly. Fixed.**
- **556717: Wavefront ascii OBJ mesh files may be imported into Modeler as Trimeshes. Face element polygons are read and subdivided into triangles if necessary. Line elements are not supported. Only the x (longitudinal), y (transverse), x(vertical) vertex data are used; vertex texture and normals are ignored. It is assumed that prior to import, the Modeler length unit is set to the unit used in the Wavefront file.**
- **228200: Renderer orientation of Stringers on section plane fixed.**
- **228196: A problem with the calculation of a web-frame on a specific model has been fixed.**

Changes: MAXSURF Stability

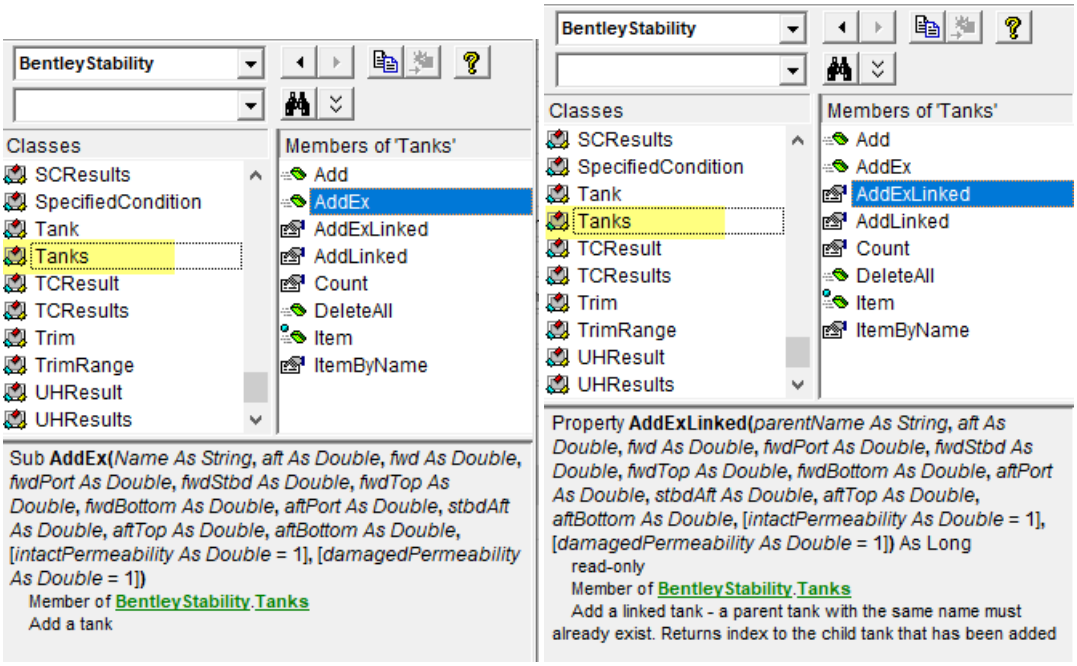
1074400: Loadcase COM automation interface

Several enhancements have been made to the Loadcase COM automation interface. This allows access to all the rows and columns (including title, totals, etc) in the loadcase. Use the RowCount and CellText methods of the Loadcase object; this access is read-only.

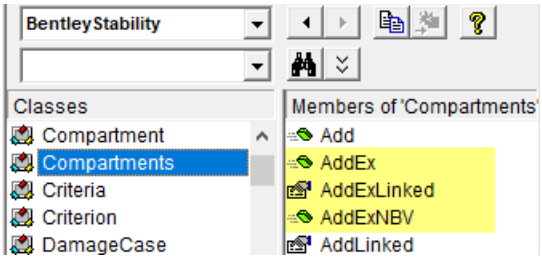


1018838: Tank COM automation interface

Some additional parameters have been added to provide greater flexibility when defining tanks and compartments via the COM automation interfaces.



Similar additions have been made to the Compartments object:



1068646: Cross-Flooding Outflow coefficient nomenclature

IMO changed their nomenclature between 2007 and 2013 – we retained the 2007 notation (so as not to break compatibility with files saved with earlier versions of MAXSURF) where the value k includes the final outlet value of 1.0. The value you enter under column "k" should include the final outlet value for k of 1.0 – MAXSURF uses the value in that column when evaluating F as per equation 2.4 in MSC.245(83):

RESOLUTION MSC.245(83)
(adopted on 12 October 2007)

RECOMMENDATION ON A STANDARD METHOD FOR EVALUATING CROSS-FLOODING ARRANGEMENTS

2 Formulae

2.1 Time required from commencement of cross-flooding θ_0 to the final equilibrium θ_f:

$$T_f = \frac{2W_f}{S \cdot F} \cdot \frac{\left(1 - \sqrt{\frac{h_f}{H_0}}\right)}{\sqrt{2gH_0}} \cdot \frac{1}{\left(1 - \frac{h_f}{H_0}\right)}$$

2.2 Time required to bring the ship from any angle of heel θ to the final equilibrium θ_f:

$$T_\theta = \frac{2W_\theta}{S \cdot F} \cdot \frac{\left(1 - \sqrt{\frac{h_f}{H_\theta}}\right)}{\sqrt{2gH_\theta}} \cdot \frac{1}{\left(1 - \frac{h_f}{H_\theta}\right)}$$

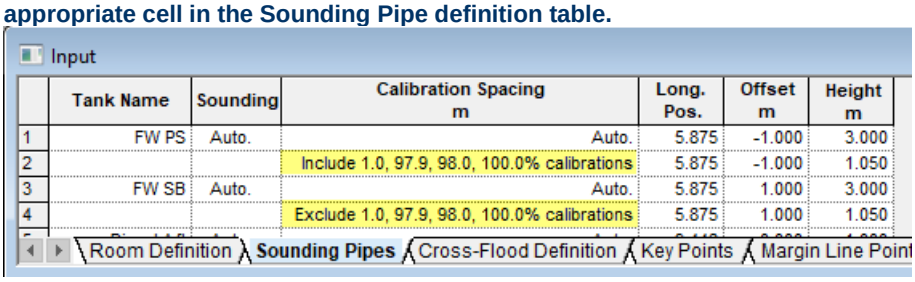
2.4 Dimensionless factor of reduction of speed through an equalization device, being a function of bends, valves, etc., in the cross-flooding system:

$$F = \frac{1}{\sqrt{\sum k}}$$

where F is not to be taken as more than 1.

Bug fixes and minor changes

- **1075539: Red Ensign Large yacht Code Part A, January 2019 Edition has been added to the shipped criteria.**
- **1060094: During probabilistic damage analysis, when checking for an already tested damage case, a check is now also made to verify whether the previous damage was a Final or Intermediate stage damage. Previously this was not the case, and this could cause incorrect results.**
- **1057732: A problem which prevented changing the type of a compartment containing a negative-linked-compartment to a linked-compartment has been fixed.**
- **1048597: A crash opening a specific model has been fixed.**
- **10466001: Tank Calibration analysis DB entries should show trim when using trim range. Fixed.**
- **1046600: Some formatting errors in the Text report have been fixed.**
- **1043337: It is possible to exclude the automatic insertion of the 1.0%, 97.9%, 98.0% and 100% sounding levels. This is done by typing 'I' or 'E' in the appropriate cell in the Sounding Pipe definition table.**

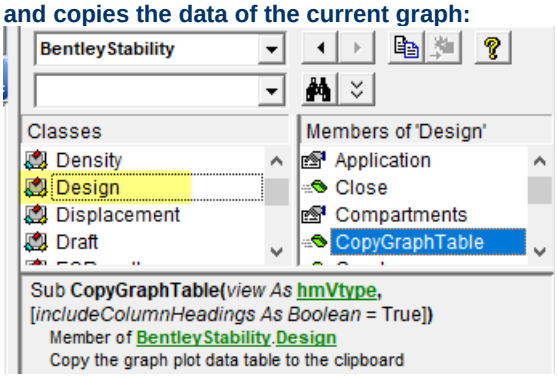

Input

	Tank Name	Sounding	Calibration Spacing m	Long. Pos.	Offset m	Height m
1	FW PS	Auto.	Auto.	5.875	-1.000	3.000
2			Include 1.0, 97.9, 98.0, 100.0% calibrations	5.875	-1.000	1.050
3	FW SB	Auto.	Auto.	5.875	1.000	3.000
4			Exclude 1.0, 97.9, 98.0, 100.0% calibrations	5.875	1.000	1.050

Room Definition | Sounding Pipes | Cross-Flood Definition | Key Points | Margin Line Point

- **1039881: An attempt to give a better indication of the progress of any analysis has been made. Because some analyses are iterative, the progress is not always 100% accurate.**
- **1039880: The calibration status of linked tanks is not shown. This is because previously it was showing an incorrect status. The status of the parent tank was correctly shown.**
- **1039865: A problem with the updating of the Tank Calibration pull-down in the Graph view has been fixed.**
- **1038522: Export lines plan, dwl on incorrect dxf layer. Was on "stringers" layer now on "dwl" layer.**
- **1037523: Limit curves for Shear and Bending Moment are drawn with a dashed line on the Longitudinal Strength graph.**
- **1033752: Auto-hide of curves on Longitudinal Strength graph. If there is no grounding then the grounding reaction distribution curve is omitted; if there are no flooded spaces, then the damage distribution curve is omitted.**
- **1032064: A problem with the calibration of tanks for a range of trim and heel has been fixed in both the UI and the COM automation interface.**
- **1033881: Permeability of exactly zero (0.0) is not allowed, this will prevent tanks from calibrating. Any non-zero, positive or negative permeability is allowed.**
- **1026834, 1025979: A problem with the Japanese language version of MAXSURF Stability when reading some criteria definition (.hcr) files which include cross-referenced heeling arm has been fixed. The problem could cause the cross-referenced heeling arm to be incorrect.**
- **1026466: Garbled value for min GZ displayed during analysis (correct once analysis completed). Fixed.**

- **3313781: The Graph data may now be copied to the clipboard using the COM Automation interface (this is useful if you wish to automatically generate your own plots in Microsoft Excel, for example.) This is a method of the Design object and copies the data of the current graph:**



- **228223: Flooded tank and compartments lost buoyancy centres are shown in NBV colour not damaged colour. Fixed.**

Changes: MAXSURF Motions

1075035, 479424: User-defined RAOs

This analysis mode is now available in all versions or MAXSURF Motions. Furthermore, support for multiple conditions of vessel speed and wave heading has been added. A different file format is used for reading in the RAOs for multiple conditions – please refer to the Appendix in the MAXSURF Motions manual for full details.

Bug fixes and minor changes

- **1079099: Water depth option disabled for panel method analysis.**
- **1077480: When non-dimensionalised by wave amplitude, angular motion RAOs now correctly show the units of [slope / length]**
- **1026965 MOSES Motions now uses MOSES Executive in headless mode during seakeeping analysis.**
- **1021606: When meshing a model to use for panel analysis, the requirement to have the target mesh edge length under a certain value has been removed.**
- **677875: RAO import from text files is now more tolerant of formatting**
- **228194: Temporary files are now removed if a panel method analysis is cancelled before it has fully completed.**

Changes: MAXSURF Multiframe

Bug fixes and minor changes

- **1079285: Fixed incorrect Kl/r calculation in Compressive Capacity check for AISC ASD2010**
- **1068670: After turning off patch visibility, patch results are still visible in plot window. Fixed**
- **1067218: Set best section for a design member causes a crash. Fixed.**
- **1064896: The rendered model now correctly updates when the section type is changed from the dorp-down combo-box.**
- **1047721: Random crash for certain models due to model depth sorting. Fixed**
- **1040812: A crash which occurred when performing a plate analysis in Multiframe basic has been fixed.**
- **1015006: A problem which caused non-uniform, distributed patch loads to be shown in the incorrect direction has been fixed.**
- **1067218; Set best section for a design member causes a crash. Fixed.**
- **228207: A LRFD bug where effective section properties were not calculated for no-compact HSS sections has been fixed.**

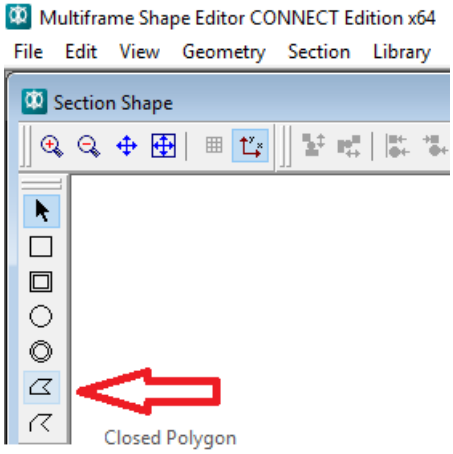
Changes: MAXSURF Shape Editor

1073894, 1046775: Custom Shape and Cutout editing functionality

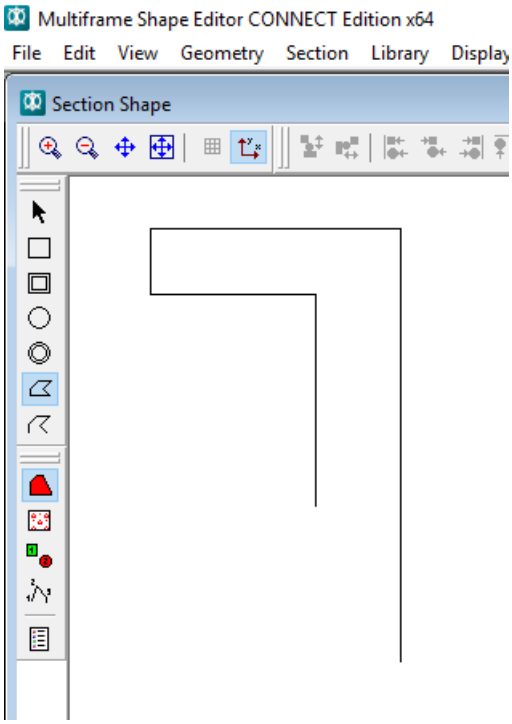
There are now two ways to add a custom stringer profile: by drawing or importing from a dxf file.

Drawing a custom stringer profile

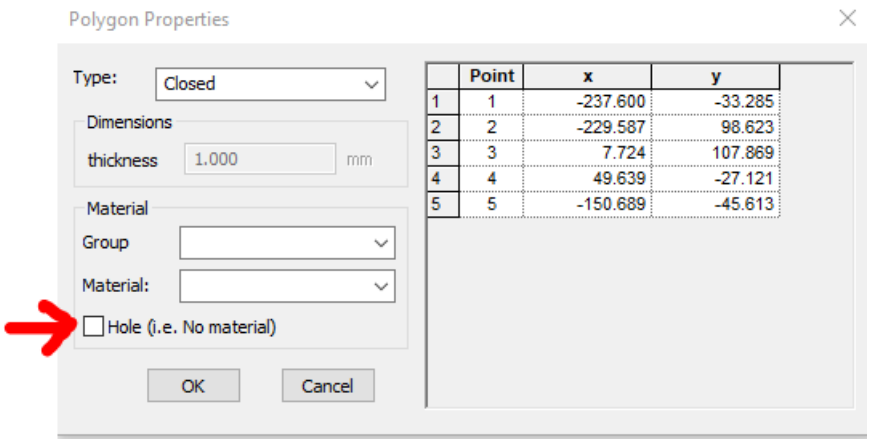
In the Section Shape window click on the closed polygon icon:



Use the left mouse button to trace out the new custom section shape for the stringer:



Double click the last point or hit return to finish the polygon and close back to the firt point. To see/edit a full list of the stringer profile points double click on the shape. Ensure the polygon in not a hole by double clicking on it and making sure “Hole” is unchecked in the polygon properties dialog:



Once you are happy with the shape it needs to be aligned to its insertion point. Click on the shape (to select it) and then choose "Geometry | Align to Centroid | Centroid". You can now add cutouts to the stringer shape or add to the library without cutouts.

Importing a custom stringer profile via dxf

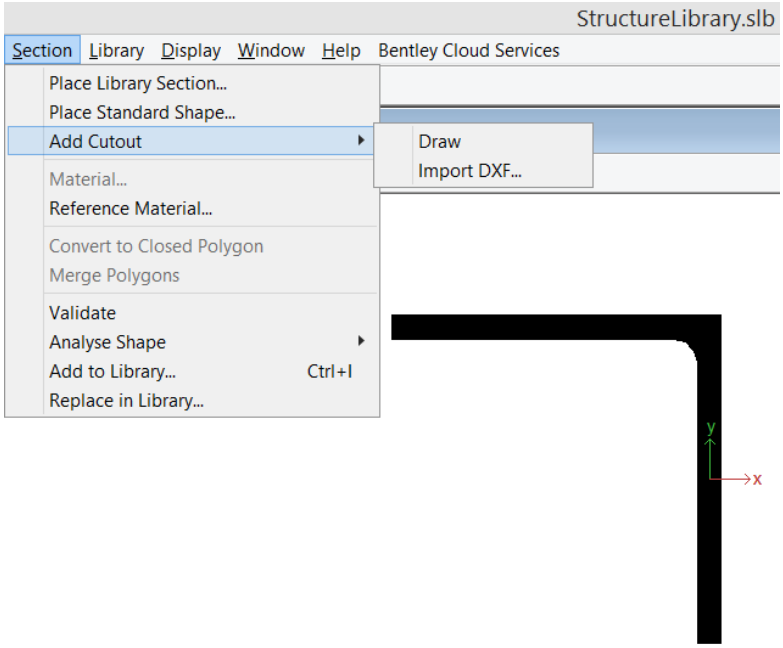
To import a dxf for use as a custom stringer shape simply choose "File | Import | DXF…" from the Section Shape window. You will be prompted for the location of the dxf file. A few rules should be kept in mind when preparing a DXF file for import into the sections library:

- **Check the coordinate system you are drawing the cutout in.**
- **Units. Ensure that the units you draw the stringer in the DXF file are the same as those used in Shape Editor.**
- **Lines and Arcs. The stringer profile in the file should be defined as a series of line segments, arcs and/or polylines that touch at the ends to form one continuous shape. Any polylines in the shape may not contain arcs within the polyline, you should explode the polyline first. The stringer profile should not be grouped (or blocked) in any way as this may result in them being placed in a Block in the DXF file that Modeler will not read.**
- **Make sure that you don't (accidentally) have data on for example a Layout or Paper space. Delete all data on all other tabs in AutoCAD and purge all data until you only have layers 0 and Defpoints and the shape you wish to import left over.**

To see/edit a full list of the stringer profile points double click on the shape. Once you are happy with the shape it needs to be aligned to its insertion point. Click on the shape (to select it) and choose "Geometry | Align to Centroid | Centroid". You can now add cutouts to the stringer shape or add to the library without cutouts.

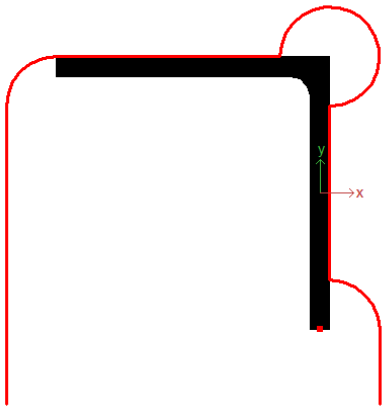
Adding a custom cutout

There are two way to add a cutout. Once a shape has been created in the Section Shape Window a cutout can be added by drawing or importing from a dxf file.



Drawing a custom cutout

When drawing a cutout make sure the base of the cutout extends at least 30mm below the base of the shape as this is used to intersect the side of the frame to create the cutout:



There is a red square drawn at the lowest point of the section (or midway between the lowesst points), this is the stringer basepoint and is where the section will be inserted on the Stringer contour in MAXSURF Modeler.

Importing a custom cutout via dxf

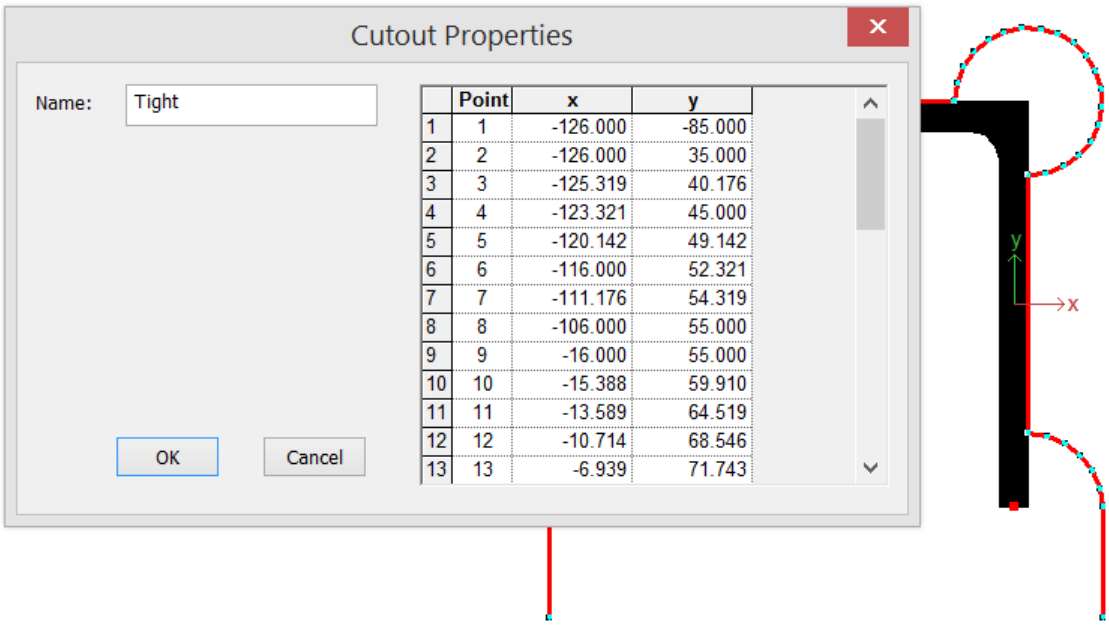
When importing a shape via dxf the user will be prompted for the location of the dxf file. The default name for the cutout will be set to the name of the dxf file. A few rules should be kept in mind when preparing a DXF file for import into the sections library:

- **Check the coordinate system you are drawing the cutout in.**
- **Units. Ensure that the units you draw the cutout in the DXF file are the same as those used in Shape Editor.**
- **Lines and Arcs. The cutout in the file should be defined as a series of line segments, arcs and/or polylines that touch at the ends to form one continuous shape. Any polylines in the shape may not contain arcs within the polyline, you should explode the polyline first. The cutout should not be grouped (or blocked) in any way as this may result in them being placed in a Block in the DXF file that Modeler will not read.**
- **Zero point. The cutout in the file should be positioned so that the point corresponding to the base of the shape on the plate is at coordinate location 0.0,0.0 in the DXF file.**
- **Make sure that you do not (accidentally) have data on for example a Layout or Paper space. Delete all data on all other tabs in AutoCAD and purge all data until you only have layers 0 and Defpoints and the shape you wish to import left over.**

Note:

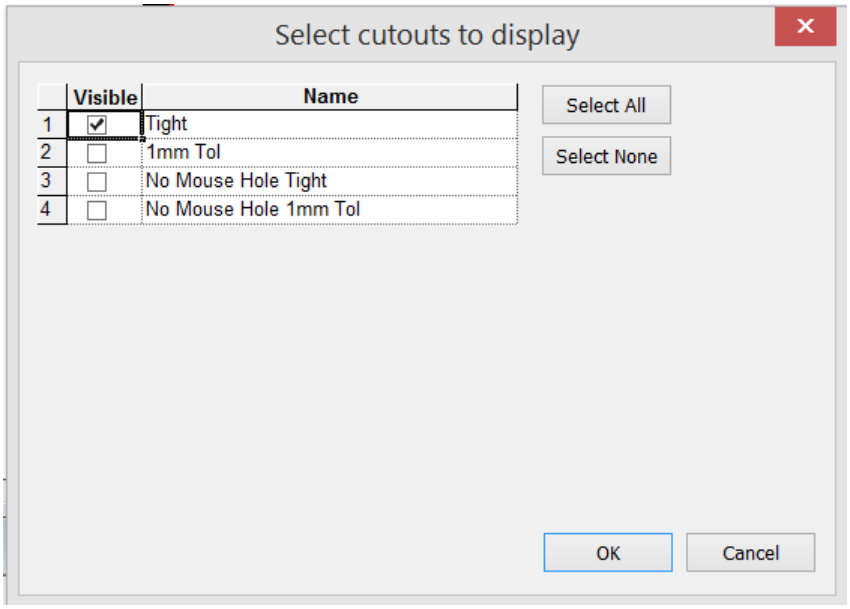
Do not move the UCS to the object. This move is not supported in the DXF output file. Instead, move the object zero point to the 0,0,0 of the UCS.

To see/edit a full list of the cutout points double click on the cutout:



	Point	x	y
1	1	-126.000	-85.000
2	2	-126.000	35.000
3	3	-125.319	40.176
4	4	-123.321	45.000
5	5	-120.142	49.142
6	6	-116.000	52.321
7	7	-111.176	54.319
8	8	-106.000	55.000
9	9	-16.000	55.000
10	10	-15.388	59.910
11	11	-13.589	64.519
12	12	-10.714	68.546
13	13	-6.939	71.743

One, None or any number of cutouts can be displayed at a time, to choose which cutouts are displayed for the current section choose Display | Cutouts… from the menu:



To delete a cutout from the section highlight the cutout by clicking on it and presse the delete key.

Once you are happy with the cutout(s) and shape you can either replace an exisiting shape in the library with the new ones (Section | Replace in Library…) or add it as a new section (Section | Add to Library…).

Bug fixes and minor changes

- **1048932: The MAXSURF sections library has been made compatible with MOSES and SACS**
- **1004908: Tapered sections lose section type Information when create new tapered sections.**

Security Release Notes

Not applicable to this release.

Problem Reports

We greatly appreciate any bug reports or suggestions you may have. Please report any bugs or anomalies you find through http://apps.bentley.com/srmanager/ProductSupport.