



**OpenForm Changes  
v2.7.1**

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# OpenForm 2.7.1 (2016-07-22)

## Bugs

### General

- [2016052058000039] Fixed Pick Point not working after holding down and releasing the Control and Shift Keys
- [2016062758000051] Improved error messages and handling when licenses are not available
- [2016062758000088] Fixed crash when running with --update-default-settings and there are initial session files that set a mode
- [2016062858000031] Fixed Windows native file dialog not being movable or resizable if it was maximized when last closed

### OFPL

- [2016062358000068] Do not assign a mesh to an imported Support Point if it is not valid

### Process

- Improved handling of invalid HTC formulas for Thermal Analysis Radiation and Convection Parameters

### Post

- [2016062358000139] Fixed Process names being truncated for certain LS-Dyna results
- [2016062958000155] Fixed changing Item type to Rod or Notch not working
- Fixed "Error: Unknown error occurred" when reading LS-Dyna results with the Read On Demand option
- Fixed Follow Nodes not working correctly if the selected Nodes are not in the initial state

## Improvements

### Post

- [2016071358000398] Added ability to recognize imported items as "Other Tools" so they will not be created as Blanks by default

# OpenForm 2.7.0 (2016-06-27)

## Bugs

### General

- [2016041858000072] Fixed program appearing off screen if it was last closed on a second monitor that is no longer available

### OFPL

- [2016060758000071] Fixed imported Drawbead Nut and Rod not being added to correct Steps

### LS-Dyna

- Fixed templates with Step control "Until Distance", "Until Time" and "During Time" with Velocity Tool in Step - missing parameters
- Fixed problem with Trim operations, by using \*DEFINE\_CURVE\_TRIM instead of \*DEFINE\_CURVE\_TRIM\_NEW

### Process

- Fixed deleting templates when modifying user defined templates with the right click menu

### Mesh

- [2015090458000019,2015090358000119] Fixed crash when meshing TWBs
- Fixed meshing failed for a specific Face

### Post

- [2015072058000037] Fixed problem importing LS-Dyna FLC data if file contained commas
- [2016031058000178] Fixed checked colors set on XY Plot actions not applying to the XY Plot buttons
- [2016050958000122] Fixed crash when importing LS-Dyna results with Composites
- Fixed percentage values of already imported Increments when reading additional LS-Dyna results data
- Fixed output of Tcl GNS\_get\_\* commands

## Improvements

### Settings

- Added option to save relative file paths in the GDB (Settings: File/Files: When Saving)
- Move Setting (Display/View: Color Failed Element) to (Mesh: General)

### General

- [2016020858000237] Added prompt to save changes before running a simulation
- Improved error message when running a simulation for non existent solver executable
- Added continuous selection ability for Angle and Distance tools
- Added option to save view data (translation, rotation, zoom) to the GDB

- Added ability to set custom filter in any File Dialog by entering text with an asterisk (\*) in the file name field

### ***LS-Dyna***

- Added ability to export simulations that have encrypted material files

### ***Process***

- [2015120458000138] Added ability for Thermal Materials to be set via Library
- Base Item is no longer mandatory for a Fluid Flow simulation
- Thermal Analysis
  - ◆ Added Angle Nodes selection method for selecting Nodes

### ***Mesh***

- [2016021758000112] Added ability to not zoom in when selecting a failed Element for Check Mesh (Settings: Mesh/General/Checking: Zoom to Fit Failed Element)
- Added ability to mesh TWBs with existing mesh

### ***Post***

- Improved speed of reading LS-Dyna INTFOR results under Windows
- Improved usability of the CCT feature
- Added Vickers Hardness variables for CCT feature
- Added ability to change line widths of XY plots by right clicking legend item

# OpenForm 2.6.1 (2016-03-21)

## Bugs

### *Mesh*

- [201603115800041] Added fix for an incorrect Face when meshing a Blank
- [2016031158000185] Fixed projection of Drawbeads onto a Tool
- Fixed very slow meshing of certain Blanks under Windows

### *Post*

- [2015102358000098] Fixed wrong item names when reading LS-Dyna INTFOR files
- [2016021858000147] Fixed display of FEMzip results
- Fixed the return values of certain Tcl functions, such as GNS\_get\_node and GNS\_get\_element

### *General*

- Removed unnecessary ambiguous picking popup dialog

## Improvements

### *General*

- [2016021058000107] Added the ability to specify the port and type in the License Server dialog

### *Process*

- Changed how Thermal Analysis Items operate. Temperature, Convection and Heat Transfer are no longer separate items, they are now Parameters within the 2D and 3D domain items

### *Mesh*

- Added ability to check Tetras in Check Mesh

### *Post*

- Added ability to modify the R Value of an FLC Curve from a session file

# OpenForm 2.6.0 (2016-02-15)

## Bugs

### General

- Fixed possible lock up when using the GNS License Server and reading a file from the command line fails
- Fixed possible crashes on certain KDE systems because global libQtDBus.so was being accessed
- Fixed description in Windows OpenForm.cfg file of how to define a triple GNS license server
- Fixed file not being removed from Recent Documents list after clicking "Remove from List", and restarting program
- Set both GNS\_LICENSE\_SERVER and GNS\_LICENSE\_NODELOCKED for an Indeed simulation if both are set

### Indeed

- Fixed crash when Indeed job failed and long lines existed in the .inf file

### Process

- Fixed cancelling the Animation Preview if the model changes
- Fixed positioning of Process Template preview popup if using multi screen
- Fixed pressing Enter accepting the input in the Simplified Parameter Editor
- Fixed the 'Used' parameter for the Drawbead Rod & Notch
- Fixed viewing and writing simulations when unmeshed and unused Items are present

### Mesh

- [2016012758000122] Fixed being unable to mesh certain TRB examples
- Symmetry and Constraints are displayed correctly if a local coordinate system has been defined
- Fixed TRB "Rolling Direction/Update to Planes" button for certain examples
- Fixed crash after using Main Tasks/Remesh Mesh, pressing Undo, then remeshing again

### Post

- [2015102358000098] Fixed importing LS-Dyna INTFOR results that have rezoning
- [2015121058000037] Fixed crash when closing program while reading results
- [2015121058000153] Fixed crash when using "Distance along current Normal" button on certain results
- [2016012658000081] Fixed loading new increments when pressing "Reload" button while an LS-Dyna simulation is still running
- Fixed not being able to stop the animation if Increments are being loaded on demand
- Fixed points in FLC dialog not reflecting visible Nodes/Elements in the model
- Fixed freezing when reading incorrectly formatted files in FLC dialog
- Stopped playback if all Processes are deleted or session is closed

## Improvements

### Settings

- [2015082658000051] Cross Section settings have been moved to the UserSettings.conf file
- [2015067858000027] Can set the colors for Background, Selection, Identify and Highlight per View

- Added automatic backup (Settings: File/Files: Auto Save)
- Improved Configurations startup dialog, also added Configuration options under the Settings menu
- Can start program with a particular Configuration using a command line argument
- Added option to select objects that are cut by the rectangle selection window (Settings: Display/General/Box Selection: Include Partially Selected Objects in Box Selection)
- Extended "Identify Tool Type by Tool Name" to handle more Item types (Settings: File/Other/Item/Types: Identify Item Type by Name)

## **General**

- [2014102458000043] Added ability to select a point at the middle of a hole
- Added ability to run Tcl scripts (File/Tcl/Run)
- Save dialog uses the Process name as the default file name
- Take Snapshot dialog is no longer modal - added a "Refresh Snapshot" button
- Take Snapshot "Save As..." remembers and increments the last name used
- Added support for using the right Control button (with the mouse, as well as Shift+F1/2/3) to move the Cross Section plane in the same way as Animator4 (also available if the dialog is closed)
- Cross Section plane also clips labels
- Changed default session file extension from ".ses" to ".ofs"
- Improved selecting a 2D point in create label dialog

## **Autoform**

- Added support for Autoform R5 (afi file)

## **LS-Dyna**

- [2015070858000061 - *partial fix*] Added a "Revert to Defaults" button the LS-Dyna templates view
- [2015090258000022] Added keywords {PRDNAM} and {PRDVAL} to export Project Data variables and values
- "Blank and Tool/Drawbead Contact" template moved to "Contact/Drawbead"
- Added support for local coordinate systems with Symmetry and Constraints
- Changed ELFORM from 2 to 16 in Blank template for Deep Drawing
- Added support for importing \*MESH\_\*\_NODE and \*MESH\_\*\_ELEMENT keywords

## **PAM-STAMP**

- Added support for local coordinate systems with Symmetry and Constraints

## **OFPL**

- [2015021058000207] Added support for TWBs
- Added support for local coordinate systems with Symmetry and Constraints

## **Process**

- [2016021258000096] Improved speed of opening Material dialog under Windows
- Write Simulation dialog uses the Process name as the default file name
- The name of the Symmetry Item is changed if its "Symmetry In" value changes (e.g. "SymmetryX" -> "SymmetryY")
- Improved the automatic resizing of columns in the Simplified Parameter Editor
- Added ability to remove a Material from a Blank
- Renamed "Drawing" templates to "Forming"
- Added FLC and Tribology parameters for TWBs

- Changed "Show Local Coordinate Systems" button, so it only shows those of currently visible Items
- Added Fluid Flow simulation type
- Added Thermal Analysis simulation type

## **Mesh**

- [2015021058000243] Added a drop down menu to limit displayed Items to a particular Operation
- Added Mesh Settings per Solver (Settings: Mesh)
- Added popup dialog with list of possible Nodes when selecting Nodes that are close together
- Improved the speed of Check Mesh if there are many Element failures
- Improved picking of Nodes so occluded Nodes shouldn't be picked

## **Post**

- [2015070858000051] Added ability to set the range of the XY Plot X and Y Axes (XY Plot dialogs: Setting/Set [X|Y]-Axis Min/Max)
- [2015072058000037] LS-Dyna FLC files are displayed in the Material Library when importing into the FLC dialog
- Added support for Abaqus results
- Added saving and loading of Wearing and CCT Materials in the GDB
- SVS Blanks are recognised and grouped as a single Blank
- Added an option to Pick Point for SVS Blanks to select a point on all layers
- Added "Shells Min" and "Shells Max" for SVS Blanks to display the min/max of all Shell layers on all layers
- Only show Items from current Process when using "Succeeding" method
- Added ability to set the Variable Layer per Item as well as per Process
- Added support for LS-Dyna ICFD simulations
- Improved speed of reading LS-Dyna results as all data is imported with a single reading of the files - setting "Read multiple variables at once" has been removed
- When importing STL files using "Import External Mesh" and the mesh isn't named in the file, use the file name instead of "Item"
- Added ability to modify the start/end time of a Process
- Added ability to modify the R values of the FLCs in the FLC dialog (right click FLC, or in the menu Edit/Modify R Values)



# OpenForm 2.5.3 (2015-12-16)

## Bugs

### General

- [2015110458000256, 2015111658000135] Fixed crash on startup after Office update
- [2015121058000037] Fixed crash when closing program while reading files

### LS-Dyna

- Fixed using part set of Blanks in Tool Contacts instead of individual Blank part ids
- Fixed Cooling templates where part ids were being used as part set ids
- Fixed calculating closing distance for tools with their own local coordinate system

### Process

- [2015090258000077] Fixed erroneous data appearing in display of curves for LSDyna materials
- [2015102158000011] Fixed Multibeads missing in some steps
- [2015101358000053] Fixed crash when copying step
- [2015110458000238] Fixed wrong name on items for MultiBeads
- Improvements to column widths in Advanced Parameter Editor
- Fixed new items being incorrectly created when adding Steps to Processes with multiple operations
- Fixed referencing Load Curves in LS-Dyna materials
- Fixed showing a constraint again if all points were hidden using Hide in Box

### Mesh

- [2015090358000119, 2015090458000019] Fixed crash when meshing Tailor Rolled Blanks
- Fixed wrong element type when exporting Indeed
- Fixed problem when automatically meshing a Multibead

### Post

- [2015102358000105] Fixed crash when getting item information on a Drawbead
- Fixed not exporting to the given file in Post Transform Dialog
- Fixed crash when exporting variable data
- Fixed not able to select variables if a process with no increments is loaded and then reloaded
- Fixed crash if history plot created and the Process was hidden, then session closed and Process reloaded

## Improvements

### LS-Dyna

- Ignore guidepins when getting stationary tools for initial movements
- Added keywords TOOPDX, TOOPDY and TOOPDZ which are the tool direction components in the Operation local coordinate
- Improved the implicit step size control parameters for gravity steps in Deep Drawing
- Changed calculation of the closing time so that tools will never move faster than their given velocity.

## ***Mesh***

- Added ability to define Tailor Rolled Bank Regions with curves

# OpenForm 2.5.2 (2015-08-28)

## Bugs

### General

- [2015072458000021] Fixed model sometimes disappearing when zooming with the mouse
- Fixed the user defined size of Snapshots produced on OpenGL 1.1 (such as over RDP)

### LS-Dyna

- [2015072458000048] Blank Node and Element Ids are always the highest in the simulation - fixes adaptivity created Ids conflicting with new Tools in later Steps
- [2015072458000057] Fixed error message when a keyword is used incorrectly
- Fixed calculation of end time for Until Closed if adaptivity is used - due to presumed LS-Dyna bug
- Fixed Hot Stamping simulations including the 'temp\_inc' file
- Drawbeads are added to the dynain file if the Tools are added

### Process

- [2015072458000039] Fixed resetting the position of the Tools after closing the Animation Preview if the Cross Section dialog had been opened
- [2015070858000042] Fixed syntax highlighting disappearing without warning from the View Simulation dialog when files contain large amounts of text
- Fixed display of Solver Dependent Parameters in Multi-Drawbead Parameter Editor list

### Post

- Fixed deleting CCT Materials when closing the session
- Fixed selecting Items with non-ascii characters in the Transform dialog

## Improvements

### Settings

- [2015072058000037] Added a separate Read and Write filter for LS-Dyna materials

### Process

- [2015081258000041] Added reading of yield curve when importing \*MAT\_PIECEWISE\_LINEAR\_PLASTICITY LS-Dyna materials

# OpenForm 2.5.1 (2015-07-15)

## Bugs

### *LS-Dyna*

- Fixed exporting Nodes with Id of 0
- Fixed "Tool Control Modelling/Stationary" template - `_LOCAL` wasn't being used

### *Post*

- Removed 'From Initial Thickness in Input Deck (LS-Dyna Only)' for the Fringe/General/Calculation: Thickness Change Calculation - didn't work for rezoned Elements

## Improvements

### *Process*

- Display Time Remaining in Run Simulation dialog using 4 significant figures, instead of 2 decimal places

### *Post*

- Display real values in Info using 4 significant figures, instead of 2 decimal places
- *[2015021158000107]* Thickness Change variable calculation defaults to 'From 3rd Principal Strain', the same as LS-PrePost

# OpenForm 2.5.0 (2015-06-30)

## Bugs

### Settings

- Fixed all text in program disappearing when changing to Chinese version on certain machines
- Fixed user defined OpenGL font not being used when starting the program

### General

- Fixed adding the default file extension when writing a file while the "All Files (\*)" filter is showing

### LS-Dyna

- Fixed exporting Multi Drawbeads after adding Mesh using "Automatic Mesh Allocation" dialog
- Fixed potential issues with non-ASCII characters being exported
- Fixed Drawbeads not having the initial movement of their coupled Tool when exporting
- Fixed Local Coordinate Systems not being used for Constraints when exporting
- Fixed Local Coordinate Systems not being used for Gravity Load when exporting
- [2015032358000039] Fixed crash when exporting a Hot Stamping simulation
- Fixed Blank-Drawbead contact when exporting an SVS simulation - using {SEPTBL} instead of {BLPTID}
- Fixed sending an error if attempting to export a Simulation that contains two Materials from the Material Library that have the same Id
- Templates with {BLMAXT} were being repeated unnecessarily when multiple Blanks existed
- Fixed Drawbead templates when the 'Move with Tool' has a local coordinate system
- An error is generated if attempting to export using templates that are yet to be filled (such as Open Cut Trims)

### OFPL

- Fixed importing and exporting of coordinate systems if the origin wasn't at (0,0,0)
- Fixed exporting GLOBAL\_INFO\_DATATYPE\_FILEDATA - was being written as OFPL, is now LS-DYNA
- Fixed exporting OPn\_SUBn\_DATA\_GRAVITY\_TYPE - is now only written for Steps that have the Solver Parameter set and the Main Parameter value "Gravity" is not "None"
- Removed unnecessary "<path>/.<path>" that sometimes appeared for Materials when exporting

### Process/Mesh

- Fixed loading of GDB if Items were saved in Boundary style - Boundary was shown in Feature Edge color when loaded

### Process

- [2014051358000092] Fixed saving/loading of "optional" LS-Dyna templates per Step
- [2015040258000148] Fixed drawing of Bars that aren't part of Drawbeads or Trims if "Draw Drawbeads and Trims on top" is turned on - they were also being drawn on top
- Fixed Operation names not being updated in the Steps table of the Simplified Parameter Editor
- Fixed crash when modifying the Material of a Sandwich Blank in the Simplified Parameter Editor if the Blank has already been meshed

- Fixed crash when starting program if a remote job had been started, and finished while the program was closed
- Fixed the Material Dialog sometimes not showing the correct material or material status when first opened
- Fixed using multiple User Materials for multiple Blanks
- Fixed crash when switching to another tab if the split view is showing the 3D view only
- Fixed crash while deleting Symmetry or Constraint Items along with other Items
- Show an error if the user tries to set a Material/Thermal Material/FLC using the Configuration files, and there is no data in the files

## **Mesh**

- [201412235800014] Fixed error while meshing certain Faces
- [201506175800018] Fixed Element edge length when using the 'Arc Dependent' Tool meshing algorithm
- 'Hide in Box' and 'Show in Box' handle free Nodes
- Set an error if the offset from existing mesh failed
- Fixed clearing of selected points when exiting the Show Tool Offsets or Show Tool Distances
- Fixed always showing the Scalar Value on selected points in Show Tool Offsets or Show Tool Distances
- Fixed refining Quad elements multiple times - Nodes created weren't being reused, leaving unconnected Elements
- Massively improved speed of selection of Elements with mouse in Main Tasks/Remove Mesh and Main Tasks/Offset Mesh
- Fixed never ending loop if using Add Mesh/From Polygon: Import and the imported file contains less points than the existing number of points
- Fixed meshing of Blank if a local coordinate system is defined with the origin not at (0,0,0)
- Fixed meshing of Blank from Circle, Rectangle, Polygon and Bar Outline if a local coordinate system is defined

## **Post**

- [2015031258000121] Fixed crash after importing a bad set of results, and then clicking on the screen

## **Improvements**

### **Settings**

- Made the behaviour "Modify User Defined" in Display/View/Lighting clearer by disabling the button when not necessary
- [2014072858000186] Added Solver Dependent Parameters (Solver/General/Solver Dependent Parameters) - this allows the user to input one value, but have it exported to different solvers as different values
- Can define multiple license servers in the UserSettings.conf parameter, by separating them with spaces
- [2015021058000191] The option --update-default-settings now looks for license information in the Linux script (openform) or Windows config file (OpenForm.cfg) found in the old version directory
- [2015021058000216] Added option to hide Drawbead Uplift Force from the user (Settings: File/Other/Drawbeads/Uplift Force)
- Added further configurable Write Filters (Settings: File/File/File Filters: Modify Write)

## **General**

- Improved usability of Point selection dialog
- Added ability to record a session file (File/Session File/Record/Start)
- Added ability to pause and continue Session Files
- Relative paths given in Session Files are now relative to the Session File, not the directory from which the program was started

## **Autoform Conversion**

- Added support for "Locating" Steps - treated as Gravity Steps

## **LS-Dyna**

- Added "Replace Material Ids if Necessary" option when "Copy Material" is turned on - if this is active, the copied Material files will be modified if the Material ids conflict
- Added support for an optional Gravity Step in SVS simulations
- Added "--no\_refinement" option to SVS export scripts
- Exported Nodes and Elements are only renumbered if necessary (i.e. if not unique)
- Added {BLROLL} keyword for the Blank's Rolling Angle
- Handle Blank's Rolling Angle in the \*SECTION defined in the "Blank and Tool/Blank" Template

## **PAM-STAMP**

- Non-"Auto" Trims are automatically converted when exporting, with a warning still sent

## **OFPL**

- [2015040258000139] Can now handle any number of SPRINGBACK\_SUPPORT\_POINTS
- Can import/export Hot Stamping simulations, with support for Step Environment Temperature, Initial Temperature per Tool and Heating, Hardening & Transfer Steps added
- Added support for GLOBAL\_DATA\_PART\_IGS\_OUTLINE (value ignored)
- Added support for OPn\_SUBn\_TIMEINTEGRATION (Step Solver Parameter: Solver Control/Time Integration)
- Added support for OPn\_SUBn\_DATA\_TIME keyword (Step Main Parameter: Time)
- Added support for OPn\_SUBn\_TOOLn\_LOAD\_DISPLACEMENT2FORCE (value ignored)
- Added exporting of OPn\_TOOLn\_DATA\_MESHTYPE keyword (import unnecessary)
- Added support for OPn\_TOOLn\_INITIAL\_DISTANCE\_TO\_MASTERTOOL (value ignored)
- Added support for GLOBAL\_DATA\_PART\_OUTLINEn - TargetOutlines are imported and exported
- Added import and export of OPn\_SUBn\_DATA\_OUTPUT\_DISTANCE\_TO\_HOME (Step Solver Parameter: Output Control/Output Distance to Home) - note that the old keyword (OPn\_SUBn\_DATA\_PLOTSTATES) is still imported
- Removed unnecessary info printed when importing Mesh files

## **Process**

- [2014110358000054] Added an LS-Dyna material library
- The Forming Type template menu is updated when the current Process changes
- Added Tailor Welded Blanks, with exporting to LS-Dyna and Indeed
- Improved keyboard navigation in Parameter lists
- Added ability to turn "Drawbead Force Generator" dialog off (File/Other/Drawbeads/When Editing Force: Use Drawbead Force Generator)

- [2015021058000225] Symmetry Items are now drawn with a transparent Plane instead of constraints on the Nodes
- Removed Deep Drawing Step templates "Close Die" and "Close Binder" - unnecessary
- [2015050658000077] Added ability to set PGP encrypted LS-Dyna Material files
- [2015050658000077] Missing Material file is not shown in red (error) in the Blank Parameter Editor when OFPL is the default solver

## **Mesh**

- Made 'Distance' value optional in Translate Mesh via Vector
- Improved Tailor Rolled Blank meshing - Set Regions is now in Add Mesh, and Tools can be meshed without the regions first being set
- Improved the flow in Add Mesh - User is given a guide by the color of the Box Titles: Green=Done, Blue=ToDo, Red=Cannot Do Yet
- Added "active" status to 3D view and Item Icon view - can use the shortcuts for Zooming and Fit to Window in the Item Icon view if it is active
- Added Blank thickness fringe plot (Main Tasks/Check Thickness & Tools/Show Blank Thickness)

## **Post**

- [2015021158000107] Thickness Change variable can now be calculated correctly if the initial thickness of the Elements varies across the same Item (see option Fringe/General/Calculation: Thickness Change Calculation)
- [2014110358000054] Added ability to add FLCs from defined Material Libraries to FLC dialog (File/Material Library)
- Added CCT (Continuous Cooling Transformation) diagram
- Added ability to use arbitrary cross sections for the X-Section plots
- Added ability to export mesh to PAM-STAMP
- Added export/import of more scalar variables to PAM-Mapping files
- Split the Scalar Variables into Standard and Exotic



# OpenForm 2.4.1 (2015-03-13)

## Bugs

### General

- Fixed crash when changing language for the second time
- Fixed Take Snapshot dialog having a very large right hand panel
- Fixed selection on screen sometimes not working when pressing Ctrl in program window and releasing when not in program window

### Settings

- Fixed crash when using the Display/General/Main Window: User Defined Window Configurations when GUI is in Chinese

### OFPL

- Fixed handling of Symmetry

### Process

- [2015012858000141] Added Tailor Rolled Blank template for Hot Stamping
- Fixed no text being shown in the list when defining a Local Coordinate System from an LS-Dyna file and the Coordinate Systems have no title
- Fixed reading \*DEFINE\_COORDINATE\_VECTOR when defining a Local Coordinate System from an LS-Dyna file
- Fixed not being able to read \*MAT\_HILL\_3R LS-Dyna materials
- Fixed JOBIDs being too long in LS-Dyna exported files
- Fixed error in LS-Dyna template "Case File/Case"
- Fixed error in LS-Dyna template "Tool Control Modelling/Start" - missing Coordinate System for \*PART\_MOVE
- Fixed use of LS-Dyna template {TOMOVX},{TOMOVY},{TOMOVZ} variables if the Tools aren't added to the dynain file
- Changed name of dummy LS-Dyna parameter from 'dummyauto' to 'dummyAP' - name was too long
- Fixed incorrect value of "ls\_dyna" environment variable when running an LS-Dyna SVS simulation
- Fixed crash when writing a PAM-STAMP simulation and an Item has no mesh

### Mesh

- [2015011458000158,2015011458000142015,2015011458000131] Fixed crashes after having used "Attempt Automatic Mesh Allocation" to assign Curves to Drawbeads or Trims
- Fixed being able to delete Conveyor Belt Elements - should be a read only Item
- Fixed Sessionfile output when using the Geometry Data to show/hide objects
- Fixed Add Mesh/From Rectangle View not remembering its previous Selection Method
- Fixed possible crash and infinite loop when meshing inappropriate Faces using Quads and the XY Plane mesher
- Fixed crash when adding mesh to a Multi Drawbead and pressing Undo
- Disable the TRB Set Regions "Apply for Visible CAD Planes" button if not enough Planes are visible
- Fixed Undo/Redo for TRB Set Regions
- [2015021158000091] Fixed large/small Elements being created along a TRB Transition cut
- Fixed offsetting of TRB Tool Elements - Nodes didn't have correct offset values near Transition cut

- Fixed exporting certain Curves to Iges
- Removed "Blank Layer" as option for Indeed T52 export - wasn't being taken into consideration
- Removed "Include Holes" as option for Indeed T53 export - wasn't being taken into consideration

### **Springback**

- Fixed Export menu item - dialog wasn't opened

### **Post**

- [2015010658000011] Fixed crash on Windows when modifying the "Force Item Name" option for STL files in the Import External Mesh dialog
- Added missing GNSOneStep1 item in Run menu
- Fixed crash when having Cross Section Plot dialog open and switching views
- Removed PAM-STAMP from Export options - not possible yet
- Fixed exporting to Indeed T53 if "Blank/Tool as Perimeter" is turned on
- [2015020558000235] Fixed reading LS-Dyna Temperature variable when using "Read multiple variables at once"
- Fixed reading LS-Dyna Heat Flux variable when using "Read multiple variables at once"
- Fixed reading FEMZIP LS-Dyna variables when using "Read multiple variables at once"
- Fixed reading LS-Dyna history variables - they start from 1 instead of 0
- Fixed reading LS-Dyna history variables - they are now correctly grouped, instead of each layer being a different variable
- Fixed updating the File matrix in the Transform dialog
- Fixed crash when picking points for the History Plots while the Cross Section was turned on and the type was "Hide Geometry"

## **Improvements**

### **Mesh**

- Added Add/Remove Region buttons to the TRB Set Regions tab

# OpenForm 2.4.0 (2014-12-23)

## Bugs

### *General*

- Fixed crash when opening the Cross Section dialog while attempting to define a vector
- Fixed Action colors not being saved/read correctly
- Fixed some dialogs on Linux having a wrong initial size when multiple monitors are being used
- Fixed the License Server for Indeed/OneStep when it is different to the GNS\_LICENSE\_SERVER environment variable

### *LS-Dyna*

- Fixed simulations when Step/Operation/Process names contain spaces - spaces are now replaced by underscores

### *PAM-STAMP*

- Fixed exporting "Master Tool" for Rod & Notch Tools
- Fixed BATOZ\_Q4GAMMA keyword
- Fixed reading of Guidepins for v1.8 or later
- Fixed incorrect export of "Blank & Non-Stationary Tools to Stationary Tool" initial movement
- Fixed incorrect export of "Blank to Stationary Tools" and "Blank to Stationary Tools & Non-Stationary Tools to Blank" if Blank is not directly above the Stationary Tools

### *Process*

- Fixed crash when closing session after reading a GDB that contains a Process from the Post view when at least one Process already existed
- Fixed the 'Reset' button when editing a Main Parameter value that is a Step Parameter
- Fixed extra Constraints appearing, not attached to a Process, after saving and loading a GDB
- Fixed Constraint Nodes being left behind when deleting a Process if the meshes had already been deleted in Mesh
- Fixed Item position and direction arrows in 2D view when the Item and the Operation both have Local Coordinate Systems set
- Fixed Trims/Drawbeads not being combined into Multi Items in an order independent manner at import - e.g. "OP20 Hole", "OP20 Trim 1", "OP20 Trim 2", "OP20 Trim 3" were being combined into "OP20" for the first two and "OP20 Trim" for the second two
- Fixed pressing Delete to delete currently selected object - it no longer worked after changing to a different view and back to Process

### *Mesh*

- Fixed crash if selecting a different Item in Items Dock while "Show Tool Distances" dialog was open
- Fixed "Show Tool Distances" sometimes not showing correct distances when more than two Tools are shown
- Fixed Element Normals and Nodes displaying with "Show Tool Distances" fringe
- Fixed free Nodes appearing after rotating or translating a Blank mesh that has Constraints

## **Post**

- LS-Dyna History Variables are now sorted properly in the History Plot dialog
- 'Show Only' and 'Show Only Box' tools now behave the same as in Process & Mesh
- Fixed no Items being visible when reading in a simulation that had no Blanks
- Fixed crash when reading certain PAM-STAMP results files
- Fixed calculation of Reference Variables when showing Elements - previously calculated as an average of the Node values, now calculated at the center of the Element

## **Improvements**

### **Settings**

- Added an SVS tab in the Solver page of the Settings dialog for all SVS related options
- Added an option for the 'Collect' status of the 'Show Only' and 'Show Only Box' tools (Preferences: Display/General/Interface: Use 'Show Only' in Collect Mode)
- Made Preferences: Display/View/Cross Section/Drawing: Cross Section Update Main View if "Hide Geometry" false by default

### **General**

- Added support for node locked RLM licensing (using environment variable GNS\_LICENSE\_FILE)
- Gave the Color Selection dialog a better window title
- Can define arbitrary plane in the Cross Section dialog
- 'Show Element Edges' has now been split into 'Show Element Edges' (genuine edges) and 'Show Element Junctions' (more than two Shells along an edge)
- Renamed Cross Section Dialog's "Volume Element Layer" option "All" to "Top and Bottom" to better reflect what it does
- Message Dialog jumps to end of text if a new message is shown
- Curve and Line end points can be selected for Distance/Radius/Angle calculations

### **Autoform Conversion**

- Added reading of Flattening keyword
- Added option to create Local Coordinate Systems for Tools with a non-Z working direction

### **LS-Dyna**

- [2014051358000092] Tool Contact Templates can be modified per Step type
- [2014112458000014] Added parameter names in comments for OpenForm exported keywords
- Added an "Initial Movement/None" template so blkdst is always defined

### **PAM-STAMP**

- Added year numbers to version selectors
- Added support for v1.9
- Added support for SVS simulations
- Added export of COUPLED\_TRANSLATION for initial movement of Velocity Tools that have different directions (v1.9 only)

### **Process**

- Added Tailor Rolled Blanks, with exporting to LS-Dyna and Indeed (thick shell & volume Elements only for Indeed)

- Send error message when attempting to define a User Material without a Yield Curve
- Added ability to import/export values for the Material Properties tables
- Highlight mesh in 3D view when editing a value in the Parameter Editor while "Show Selected Border" is off
- Improved positioning of Tools above/below Blank in the 2D view - the Tool's default Direction is used instead of the Direction for the Step
- Tool Direction arrows are shown for the currently selected Step, not always the default Direction
- Can copy from an existing Tool when defining a Tool Direction Vector
- Added syntax highlighting to the View Simulation dialog and the LS-Dyna Solver templates

## **Mesh**

- Scalar Value of "Show Tool Distances" and "Show Tool Offsets" is now shown when using the "Pick Point" tool
- Added handling of Planes from Iges files in Geometry Data tree and in Modify commands
- When adding Mesh from existing Mesh, the offset can be given as a ratio of the thickness
- "Blank (XY Plane)" mesher now bases the orientation of the Elements on the Rolling Angle of the Blank
- Meshing Blank with thick Shell or Solid Elements places the Element middle layer at the level of the Face/Curve/Rectangle/etc, instead of the Element bottom layer

## **Post**

- Improved clicking on the slider - slider still jumps by 'page step' (10), but now never goes past the increment under the mouse  
NOTE: it is still possible to middle click on the slider to jump directly to the increment under the mouse
- Added option to set the name of the Items created from LS-Dyna Properties for 'd3plot' and 'intfor' simulations (Preferences: File/Post/LS-Dyna Import: Item Names (*[d3plot/intfor]*))
- Added Icons to the FLC legend in the FLC dialog, to clearly distinguish between Blanks and FLCs
- Added a description text to the FLC legend in the FLC dialog, to explain how to drag Blanks onto FLCs
- Selecting a plane in the Plane dialog list now updates the values in the point and vector fields

# OpenForm 2.3.1 (2014-11-20)

## Bugs

### General

- Fixed sending two errors when attempting to read a non-existent Sessionfile from the command line
- Fixed default OPENFORM\_USERDIR in Linux 'openform' script - from "/home/\$USER" to "\$HOME"
- Fixed updating when changing the Case Sensitive button in the 'Search' mechanism in text widgets
- Fixed problem with using 'view="3D View"' in sessionfiles, if the mode() had been called in the sessionfile - sometimes the wrong view was found

### LS-Dyna

- Fixed incorrect direction for velocity Tools when exporting (was always in Z direction)
- [201410245800034] Fixed incorrect column alignment of values in "Tool Control Modelling - Force Controlled" template
- Fixed exporting SVS Blank mesh file when there is no Trimming Step

### PAM-STAMP

- Fixed Trims being created as Other Tools when the .mif file was missing
- Fixed Tools' Move Vector not being set correctly when importing

### OFPL

- When importing, set the Time Control to During Time=0 for non Gravity/Closing/Forming/Trimming/Springback Steps - this allows the animating of the Process

### Autoform Conversion

- Fixed Guidepins not being created when PilotGroups exist, but "Convert Guidepins" option is turned off

### Process

- [2014110358000091] Fixed crash when attempting to animate a Process from a User created template, where an Item doesn't have mesh defined
- Fixed animating a Process with Multi-Trims
- Fixed hiding/showing Items and using Cross Section dialog while animating a Process
- Fixed reading Icon Templates under Linux that have Windows line endings
- Fixed crash when closing Cross Section dialog if a 3D view hadn't been shown
- Fixed tooltip for "Position" Main Parameter - was always referencing 'Tool' even if it wasn't a Tool
- Fixed selecting Multi-Drawbeads when selecting via the Item List - sometimes the selected border wasn't being shown
- Fixed deselecting the Elements of a deleted Item if the referenced Elements weren't deleted
- Fixed border for Blank when Quad elements have been refined
- Fixed only the last Item being selected in Item List when multiple Items were selected
- Fixed only the last Item being selected in the Simplified Parameter Editor when multiple items were selected
- Fixed selecting individual Drawbeads from a Multi-Drawbead when selecting in the Simplified Parameter Editor

- Fixed crash after undoing the reading of a Process with Orthogonal Trims, then running another command
- Fixed Nodes sometimes not being deleted when deleting a Process with Constraints

### **Mesh**

- Fixed fringe scale range for Tool Offset, Tool Distances and Show Offset task when no data is available
- Fixed border for Blank when Quad elements have been refined
- Fixed crash after undoing meshing a Tool while in the "Check Offset" task
- Fixed crash after undoing a Transparency All On/Off in a Process with Constraints
- Fixed Show Tool Distances dialog disappearing sometimes unexpectedly
- Fixed sessionfile output of Transparency changes ("command.view.color.apply()") not working when read again

### **Post**

- FLCs are now hidden when they have no more Blanks and are shown when they gain a Blank - this means that only currently used FLCs will be shown

## **Improvements**

### **General**

- Upgraded to RLM v11.2 - adds support for IPv6 license servers
- Escape now hides the 'Search' mechanism in text widgets
- Highlight matches found with the 'Search' mechanism in text widgets

### **Process**

- Use title in preference to file name for Material name when using certain LS-Dyna material files
- All Tools can be set to Force/Pressure/Spring Controlled - no longer only Binders
- Added an option to always show the arrows on the Force lines of a variable Drawbead (Display/View/Labels/Drawbead Force Labels: Always draw Arrows)
- Output a more detailed list of missing mesh for Items when attempting to animate a Process
- Improved speed of Show Tool Distances dialog

### **Mesh**

- Improved speed of Show Tool Distances dialog

### **Post**

- [2014101658000095] Added option to Cross Section Plot dialog to calculate the X distance using either the Point on the Plane or the Uncoiled Cut Line (Uncoiled Cut Line was the previous default)

# OpenForm 2.3.0 (2014-09-03)

## Bugs

### General

- Fixed drawing performance issues with remote rendering when driver offered OpenGL 2, but no direct rendering
- Improved dragging of line in Cross Section dialog, particularly at the edges of the view

### Settings

- Fixed --update-default-settings option overwriting the Settings/Actions/ToolBars.xml file with the Settings/Actions/Menus.xml file

### PAM-STAMP

- Corrected the export of a Step that uses the Advanced Implicit Calculation and had refinement and an ELEMENT\_STRAIN\_ORDER wasn't 1
- Fixed missing keywords when exporting non-orthogonal Trims to v1.8+
- Positioning of Drawbeads to their Tool is only done once, instead of in every Step

### Autoform Conversion

- Fixed scaling of Drawbead forces by equations containing Yield Stress for materials that use a Ludwig Yield Curve
- Fixed crash when importing some Autoform simulations that did not have a comment at the top of the .inp file

### LS-Dyna

- Fixed "Overwrite existing simulation?" warning not being shown when starting a simulation
- Fixed missing quotes in the SVSLSDynaScript.bat surrounding Step names
- Added a workaround for "The process cannot access the file because the file is being used by another process" error on Windows when running simulation

### Process

- Fixed Animation Preview for "Until Distance" Steps when the "Initial Movement Calculation for Preview" is set to "All Steps"
- Give an error message if a simulation finished but not all Steps ran, instead of "Simulation finished"
- Fixed a crash when clicking a Rezoning Zone in the 3D view
- Fixed selection of Arbitrary Points when defining a Local Coordinate System

### Mesh

- Fixed possible crash when clicking the "Auto Repair" checkbox in the Autoform Conversion Settings when importing an Autoform .af file
- Minimum length is now honored when meshing a Blank
- Fixed reading the session file output when hiding/showing Properties using the Geometry Data list
- Fixed dragging of points using Mouse in Add Mesh/From Polygon
- Fixed the Blank sometimes moving in Z when using Remesh, if meshing with Indeed thick shell elements



## **Post**

- Fixed difference in Open Dialog between double clicking a directory and pressing 'Open' for the preselection of a file
- Fixed a crash when reading LS-Dyna results where the result files were not complete
- Fixed possible crashes while importing LS-Dyna results on Windows
- Fixed potentially very large amounts of memory being used when importing certain LS-Dyna results
- Show the progress dialog earlier when reading LS-Dyna results
- Fixed crash when pressing Ctrl+Insert when only the initial Geometry has been loaded
- Fixed the "Max" layer of certain variables not displaying the correct values
- Fixed crash when using On Demand, and moving the increment slider

## **Improvements**

### **General**

- Improved licensing information for 3rd party libraries
- Made RLM the default License Server Type
- Can continue to display Cross Section after dialog is closed

### **Settings**

- Can set a color on the Actions, and a checked color on checkable Actions
- Can save and load Window configurations, i.e. visibility and positions of ToolBars, DockWidgets (Preferences/Display/General/Interface/Main Window)
- Can set different colors for Drawbead Restraining and Uplift force lines
- Added option to show relative factors instead of resulting forces for Drawbeads' Item Info labels (Preferences/Display/View/Labels/Drawbead Force Labels)
- Can have session files that are run at program and view start: <installdir>/SessionFiles/Initial/
- Added License Server Type and Port options to the UserSettings.conf

### **PAM-STAMP**

- Added HISTORY\_INCREMENT\_PERIOD keyword (only for Advanced Implicit Calculation Steps and v1.8+)

### **Autoform Conversion**

- Drawbead Force values are no longer normalized, so the values in the table are the same as the original file, and the "Scale Factors" are the conversion factors

### **Indeed**

- Added "Closing Control/Default Closing Gap" and "Closing Control/Closing Gap %" Solver Parameters for Type 3 Tools
- Drawbeads with constant forces are exported the same way as variable forces

### **Process**

- Can set a display name for Main and Step Parameters in the Advanced Editor: <installdir>/AdvancedParameterView.xml
- Added the option Preferences/File/Other/Constant Drawbeads: Allow Table for Constant Drawbeads to allow the modification of the constant Force values via the Table, same as the variable values

## **Mesh**

- [2013072558000139] Added Tool/Show Tool Offsets to display the offset value for visible Elements as a fringe
- [2013072558000139] Added Tool/Show Tool Distances to display the distance between Tools as a fringe, taking into consideration the Translation amounts
- [2013072558000139] Added Main Tasks/Check Offset to compare the actual nodal distances with the amount by which the Tool was offset
- [2014070958000051] Added "Offset Mesh" task for Tools to offset after they have been assigned a mesh

## **Post**

- Added ability to import user variables from a CSV file: File/Import External Variables...
- Attainable Units value of Wearing Variables is rounded to a multiple of 5
- Added importing of PAM-STAMP erfh5 results
- Variables listed under "Other" are now sorted alphanumerically
- Added Tools/Planes to create and export planes to a csv file
- Can export Facets to Autoform af files
- Added the reading of FEMZIP LS-Dyna files while using the "Read multiple variables at once" option
- Modified how the local Principal Stresses and Strains are calculated for the "Mid" layer to be similar to LS-PrePost - the global Stresses/Strains layers are averaged and the average is transformed to the local coordinate system, rather than transforming the global layers to local and then averaging them
- Can continue to display XY Plot Cross Sections after the Plot dialog is closed

# OpenForm 2.2.1 (2014-06-20)

## Bugs

### *General*

- Fixed issues with window zoom when zoomed in closely
- Fixed Fit to Window happening unexpectedly after initial program start

### *OFPL*

- Fixed importing the FLC file parameter for the Blank
- Fixed importing the material for the Blank - the material wasn't being recognised as okay
- Relative paths are no longer checked at import if absolute paths are given
- Fixed some imported Properties appearing under "Locally Created" in Mesh view
- When importing a project, if an Iges file was referenced multiple times, only the first Item was meshed
- Fixed both Processes begin shown as selected if two were imported at the same time while "Show Selected Border" was turned on

### *LS-Dyna*

- Fixed incorrect value in template for Step Solver Control/Springback

### *Autoform Conversion*

- Fixed possible crash when clicking the "Auto Repair" checkbox in the Conversion Settings dialog when loading from the Mesh view

### *Indeed*

- Fixed value of uplift force scale factor when not listed in dat file

### *Process*

- [2014061158000156] Fixed setting an LS-Dyna Thermal Material
- Fixed crash when importing an Indeed dat file when OFPL license isn't available
- Fixed Items not being drawn in main view if an Item was shown with the Detached View showing
- Material Configuration files are parsed at program start, so any warnings appear immediately instead of during the import of a file
- Removed "Deleted Elements, Nodes, Properties" messages when deleting a Process and its Elements

### *Mesh*

- Fixed meshing Blanks from Curves when Curve had Circular Arcs
- Fixed crash when using "Existing Faces" dialog, attempting to select something, and then switching the view
- Fixed hiding/showing of entire Constraint Item when using right click menu
- Fixed picking of Constraints to hide/show when using right click menu
- Files containing a Process no longer appear in the Recent Documents menu
- Reduced the gaps between Faces when shown in Solid style

## ***Post***

- Points selected in Formability dialog weren't showing Element Id in the main view if Element variable was showing
- Fixed the "Trend Line" of the Formability dialog when the simulation contained warped Quads
- Fixed Run actions - they weren't being allowed

## **Improvements**

### ***General***

- Made the disabled text color darker, improving readability

### ***OFPL***

- Can import any known mesh or geometry file, not just LS-Dyna and Iges
- Imported free Nodes are now deleted
- Imported Properties with empty or default names are now given the Item's name
- All Elements from an imported mesh file are used for the TOOL and PART Items instead of just the first Property

### ***LS-Dyna***

- SVS run simulation scripts now handle process with a Springback Step but no Trimming Step

### ***Process***

- The 3D View is now the initially active view when starting the program or switching views

# OpenForm 2.2.0 (2014-06-05)

## Bugs

### General

- Fixed background color changing when using Indirect rendering and rotating with "Dynamic"

### PAM-STAMP

- Fixed incorrect export of MultiTrim items to PamStamp
- Fixed incorrect export of Trim DIRECTION and ORTHOGONAL keywords to v1.8 and above
- "GUIDE\_WITH\_MATERIAL" keyword is now written as "GUIDING\_WITH\_MATERIAL" when exporting to v1.8 or later

### Autoform Conversion

- Fixed Guidepins' Friction not being set to 0 in some cases when using the "No Friction in Gravity and Springback Steps" option

### Process

- Fixed adding Items to Steps that haven't run yet in a Restart Process
- Fixed not being able to modify the Control parameter of Tools in Steps that haven't run yet in a Restart Process
- Fixed crash when undoing the creation of a Restart Process

### Mesh:

- Fixed diagonally neighbouring elements possibly having more than 1 refinement level difference when meshing a blank with "Refine Edges"

### Post

- Fixed the Smooth style display when the Element normals aren't oriented consistently
- Fixed reading when "Read multiple variables at once" option is turned on
- Fixed the "Go to the Tutorials Website" menu item
- Fixed Element Normals ignoring the Size settings

## Improvements

### General

- [2013092758000051] Added tool to measure along a Cross Section line (Tools/Calculate Distance along X-Section)
- Message Dialog can now be permanently docked

### Settings

- [2013100158000123] Added an option to show the Language menu in the main Menu bar (Settings: Display/General/GUI: Show the Language Option in the Menu Bar)
- Added option for the color of the rear side of shaded Faces (Settings: Colors/Other Colors/Objects: Faces Back Side)

- Extended the Solver conf files to add "tooltip" and "restrict" options - giving the ability to modify the Solver Parameter options
- Removed Display/General/Interface: Render Engine - now unnecessary

### **OFPL**

- Read and write \*GLOBAL\_DATA\_PROJECT\_NAME\_PROJECT as the Process name
- Write \*GLOBAL\_DATA\_PROJECT\_PATH and \*GLOBAL\_DATA\_PROJECT\_NAME\_PROJECTFILE

### **LS-Dyna**

- Step Solver Parameter "Refinement Control/Refinement Time Interval" changed to a "/Refinement Distance Interval" and is used to set ADPFREQ and ADPENE in the templates
- Write \*GLOBAL\_DATA\_PROJECT\_PATH and \*GLOBAL\_DATA\_PROJECT\_NAME\_PROJECTFILE

### **Indeed**

- Added import and export of Drawbead Uplift Force

### **PAM-STAMP**

- Added "Advanced Implicit Calculation" solver parameters, and some missing "Implicit Calculation" solver parameters
- Don't autoposition Force controlled tools if they have already been in a previous step

### **Autoform Conversion**

- Added an option to Force Tools: "Apply Force in previous Closing Step"
- Added scaling option for Drawbead Uplift Force in the same way as the Restraining Force
- Convert a Friction value of zero using the Friction table/equation

### **Process**

- [2010110310000052] Added dialog to compare Materials (via Material Selector and Tools/Compare Materials)
- Tool "Working Direction" and "Direction Vector" parameters are now treated as Main Parameters by default (see Settings: File/Other/Item: Step Parameters to Treat as Main Parameters)
- Added Scale Factors to the Drawbead Force table
- Rows in variable Drawbead Force table are colored red if change in force exceeds that defined in Settings: File/Other/Variable Drawbeads: Max Drawbead Force Transition Rate
- Hide in Box & Show in Box now hide/show individual Constraints

### **Mesh**

- Show Only and Show Only Box operate now in 'collect' mode - multiple objects can be selected, right click to finish selection
- Added Show Face Normals button
- Hide in Box & Show in Box now hide/show individual Constraints

## ***Post***

- Combined "Export Mesh..." and "Export Results..." into single dialog "Export..."
- The fringe scale of Wearing variables with an "Available Units" scale selected now range from 0 instead of the smallest variable value

# OpenForm 2.1.2 (2014-05-19)

## Bugs

### General

- Fixed crashes when using OpenGL Indirect Render Engine
- Fixed speed of drawing after initial draw when using Indirect rendering (regression from v1.13)
- Fixed Zoom In & Out scaling - they are now reciprocal

### Settings

- [2014040958000057] Fixed File Dialog directories not obeying the Settings: File/Files/Directories: Synchronize Input/Output Directories option under Windows

### OFPL

- Fixed Autoform and User Materials not being exported properly
- Fixed reading \*GLOBAL\_DATA\_PROJECT\_PATH, \*GLOBAL\_DATA\_PROJECT\_NAME\_\* keywords
- Fixed reading \*OPn\_SUBn\_BLANKSUPPORTn\_CONSTRAINTS keyword
- Fixed crash when using Springback Support points

### LS-Dyna

- Fixed {MAID+\*} variable reusing material ids when used in different templates
- Fixed multiple SVS Sandwich Blank bugs
  - ◆ Fixed errors in SVSLSDynaScript.sh script ("error" and "message" functions not defined)
  - ◆ Fixed error in SVSLSDynaScript.bat script (incorrectly copying .dynain results file from previous step into springback directory)
  - ◆ Now using \*SET\_NODE\_LIST instead of \*SET\_NODE in the exported file holding/nodeSets.k
  - ◆ Fixed incorrect path written to exported file trimming/thick\_in2.k
  - ◆ Fixed incorrect \*INCLUDE of tool mesh files in the exported thick\_in.k files
  - ◆ Removed superfluous change dir commands in the SVSLSDynaScript.sh/.bat scripts
  - ◆ Fixed missing \*SET\_PART card in exported file Prep\_Springback.k
  - ◆ Fixed SVS templates that include files if the exported filename isn't {PRNAME}

### Process

- Fixed crash when deleting Items and their Elements
- Fixed Multi-Trims and Multi-Drawbeads being shared between different Processes when the imported Items have the same name
- Fixed hiding previously current Process when selecting a Step of a new Process
- Fixed accidental drag selection when clicking on Visibility or Style icons in Item List
- Fixed showing the selected borders if "Show Selected Border" is active, and we are switching back from Mesh view
- Fixed the parameters shown for Drawbeads in the Simplified Parameter Editor
- Fixed crash when undoing the loading of a file while an Item was selected, the loading a new file
- Fixed crash when changing a Step's Type



## **Mesh**

- [2014041158000034] Fixed poor boundary Elements when meshing certain large Blank outlines
- [2014042458000028] Fixed potential crashes while meshing large Tools
- Fixed never ending loop while using Add Mesh/From Mesh if all Selectable Colors are the same Color
- Stopped Surfaces from being shown with Show All or Swap
- Reduced the gaps between Faces when shown in Solid style

## **Post**

- Fixed Item Direction arrows from Process being shown if Show Selected Border is on and Items in Process are selected
- Fixed multiple Wearing bugs
  - ◆ Fixed Shearing wearing variable not being recalculated when the wearing fringe scale settings change
  - ◆ Fixed bug in calculating wearing variables for Nodes
  - ◆ Fixed Wearing Summary not updating when "Show On" setting is changed between Node & Element
  - ◆ Fixed not all values in Wearing Summary being updated when the scale selection is changed

## **Improvements**

### **General**

- Improved description in ToolTip of Lock Control Button
- Added '%st#' (Step Type of the given Step number) for use in the Executable argument lists

### **LS-Dyna**

- Multiple SVS Sandwich Blank improvements
  - ◆ Added export of ExtractBlank.k files to prepare\_drawing and prepare\_springback directories
  - ◆ Now support the Die being below the Blank, not just above (Changes to the exported files parameters.k & Prep\_Drawing.k)
  - ◆ Can now export a Process containing a Springback step with no Trimming step prior

### **Process**

- Give better error message when attempting to read in non-Simulation Process files with Open Dialog

### **Post**

- Added drawing of bar plots in the Wearing Summary
- Added reading and display of X-axis and Y-Axis units for Wearing curves

# OpenForm 2.1.1 (2014-04-17)

## Bugs

### General

- Fixed crash when using Indirect rendering
- Fixed mouse selection in 3D view if "Lock Control Button" is active
- Fixed shortcuts if "Lock Control Button" is active
- Fixed crash if using the Quit action in the Right Click Menu

### Autoform Conversion

- Fixed Friction being set on coupled Tools if the Friction was set for all Tools
- If "Convert Locked Drawbeads" option is on, don't set the Uplift Force to 0
- Fixed "Equivalent Library Material" option if original .mat file couldn't be read
- Fixed incorrect Drawbead force values if an equation with "Yield Stress" is used and the material uses "Combined-SH" for the yield curve

### OFPL

- Fixed recognising files that have the wrong format when importing
- Fixed crash when importing and the mesh files cannot be found or read
- Fixed crash when importing a file without \*GLOBAL\_INFO\_GLOBAL\_COID line

### LS-Dyna

- Added {MAID+\*} keyword for material ids, so they aren't duplicated - was stopping some simulations from running properly as the Blank was rigid
- Corrected node ids in the node set when exporting for SVS
- Added material files to subdirectories when exporting for SVS

### Process

- Fixed creating a Restart from a .dat file that contains Guidepins or Blank Supports
- Added "Element To Thickness Ratio" to the OFPL "Solver" table in the Simplified editor
- Fixed deletion of a User Template - was removing entire file even if other templates were referenced in the file

### Mesh

- Fixed crash when pressing "Show Info on all visible Items", when Bar elements were visible
- Fixed not being able to modify the meshes of a Multibead after removing one of the Multibead's drawbeads
- Fixed crash when importing some VDA files
- Fixed crash when importing some Iges files
- Fixed importing JT files with Shape=None
- Fixed potential crash when switching to Process while a 'Task' was open

### Post

- Fixed reading German word for Contact Pressure when reading Indeed results
- Fixed multiple Wearing bugs

- ◆ Don't interpolate below lowest curve
- ◆ Fixed error in calculation of Available Units
- ◆ Fixed issues when modifying Wearing Scales

## Improvements

### ***Settings***

- Added an optional export directory to the --update-default-settings dialog

### ***General***

- When defining a vector by selecting a Node, a point is drawn at the Node
- When defining a vector by selecting a Curve, the vector is taken as the tangent at the point clicked
- Added the executable for the GNSOneStep1 solver

### ***Process***

- Deleting an Operation or Step will delete the now unused Items as well
- Improved performance when clicking different objects while "Show Selected Border" is active
- Don't elide text in Parameter Editor if there are only two columns

### ***Mesh***

- Added "Export in Local Coordinate System" option when exporting Mesh
- Improved performance when clicking different Items while "Show Selected Border" is active

# OpenForm 2.1.0 (2014-03-21)

## Bugs

### General

- Fixed crash on Windows when selecting many files in the native File Dialog
- Fixed allowing negative values & values starting with "." to be entered into real text fields
- Fixed crash when pressing "Check License Status" with RLM license
- Fixed potential crashes in Chinese version when using a locale other than UTF8

### Settings

- Fixed Settings/Actions/Shortcuts.xml not being updated when deleting or renaming an Action
- Fixed --write-default-settings when both Global & User settings are used (e.g. Fringe Scales)
- Fixed handling obsolete names in the LockedSettings.conf file

### Autoform Conversion

- Fixed "No Friction in Gravity and Springback Steps" option not working for coupled tools

### LS-Dyna

- Fixed naming of 'INCLUDE' files for SVS when exporting
- Fixed the endtim value starting in the wrong column in Trimming Step Solver Control template
- Fixed the Trimming template - Trim Curves and Load Curves can't have the same id
- Removed \*CONTROL\_OUTPUT from the Trimming Solver Control template - it is already in the Common template
- Fixed Cooling Contact templates - Part Ids were being recognised as Part Sets
- Split the "Extract Tools", "Prepare Drawing" and "Prepare Springback" SVS templates into Start & End sections, so that OpenForm can write the material INCLUDE and SET\_PART definitions in between instead of at the end of the file
- Added export of missing files in trimming directory when exporting an SVS process to LS-Dyna - the reference blank is now used in the trimming step, not the 3 SVS meshes
- Fixed incorrect .dynain filenames written when exporting an SVS process to LS-Dyna
- When exporting an SVS Blank the part id of the Blank was written to the dynain file instead of the part ids of the SVS meshes
- Fixed crash when exporting SVS if only 1 Step defined

### PAM-STAMP

- The "BLANK\_TYPE" keyword is no longer written out when exporting for PAM-STAMP version 1.8
- When exporting Blanks that have refined edges, "PARENTS" and "REF\_LEV" data is now written out to the .mif file
- Added "Advanced Implicit Solver" option to the PAM-STAMP Solver parameters "Step/Gravity/Calculation Type" and "Step/Springback/Calculation Type"
- The "GRAVITY\_VALUE" written out is now correct for any chosen Unit System, instead of always being 9810

## **Indeed**

- All points of Variable Drawbeads were being locked, even if only some points were locked

## **Process**

- Material dialog now shows correct material values for LS-Dyna material MAT\_3-PARAMETER\_BARLAT
- Fixed permissions of SVSLSDynaScript.sh script on Linux
- Changing the "Used" parameter checkbox had no effect while an editor for another parameter was open
- Fixed the material Density when importing an Indeed DAT File if material is defined using NO\_MBL

## **Mesh**

- [2014022858000131] Fixed meshing certain Faces with "Arc Dependent" mesher
- Fixed Settings: Display/View/Labels/Mesh Checking: Color Failed Elements
- Fixed the Geometry Data list getting out of sync with program
- Fixed possible crash when deleting a File from the Geometry Data list
- Fixed creating a Quad mesh when using the Tool Paver or Blank Non-Flat meshing algorithms
- Fixed not being able to mesh further Faces for a Blank if it already had thick Shell Elements
- Showing and hiding of Faces via the right click menu now shows/hides connected Cons as well

## **Post**

- Fixed crash when modifying Comparison Configuration with 2 or more views showing
- Fixed crash when unlinking Variables while multiple Views are shown and a Process isn't shown in one View
- Fixed crash when switching from 4 Views to 1 when the 1st View isn't the active View
- Stopped Constraints in post displaying with a style icon
- Fixed very large coordinates from corrupting the view state (fit to window etc...)

## **Improvements**

### **General**

- Fixed spurious error messages being sent when setting the same color again
- Fixed formatting of Command Line messages for Windows

### **Settings**

- Added --update-default-settings command line option, allowing the upgrade of the settings from a previous version configuration
- Added a "Recent Commands" help dialog to the "Session Command" Action edit dialog
- Added a Default Style (Settings: Display/Visualization/Styles - Default Style)
- Moved Indeed License Server from ProgramSettings.conf to UserSettings.conf
- Moved File Options settings from ProgramSettings.conf to UserSettings.conf
- Moved current Simulation Executable setting from ProgramSettings.conf to UserSettings.conf
- Moved Simulation Options settings from ProgramSettings.conf to UserSettings.conf
- Can change the name, description and icon of "reference" Actions (Actions on the right hand side of the Actions modification widget in the Settings dialog)

## ***Autoform Conversion***

- When the "Use Equivalent Library Material" option is selected, the library is now also searched for filenames that match the Autoform material's filename, not just the Autoform material's name
- Added "Convert Locked Drawbeads" option to Autoform Conversion Settings, to replace locked drawbeads with a high (user-specified) restraining force

## ***PAM-STAMP***

- Velocity controlled tools in the same step have initial movement applied as a single unit, instead of individually
- If initial movement is "Blank & Non-Stationary Tools to Stationary Tools", the items are moved as a single unit instead of individually
- Non-Stationary items have initial movement applied only once per operation, initial movements in further steps are ignored
- Can now export tools with "Coupled" Control type
- Changed the default "Unit System" PAM-STAMP Solver parameter from "mm.kg.s" to "mm.t.s"
- When writing out a material into an .att file, if the LAW value is "BARLAT", it is changed to "BARLAT\_89", "BARLAT\_91" or "BARLAT\_2000" depending on which parameters are defined

## ***Indeed***

- Allow multiple AUTO\_DISPL\_CONTROLLED tools in a Step, even if they have been previously defined

## ***LS-Dyna***

- [2014021958000096] Added ability to set Die & Die Insert to Force Controlled in Hot Stamping Simulations
- Added some LS-Dyna templates for User Defined Steps

## ***Process***

- Added Orthogonal option to Trim's Working Direction parameter
- Added Multi Trims, analogue to Multi Drawbeads
- Added ability to group Templates together - subdirectories in Settings/Template directory are grouped
- Added "Target Outline" Item - can be used to show Blank outline in Indeed results
- Materials for all Solvers are listed for the Blank in the Parameter Editor
- Improved overwrite message when exporting a simulation

## ***Mesh***

- Added a setting for the 'Neighboring Normals' check to show Elements as failed if a single edge fails (Settings: File/Other/Item/Mesh Checking)
- Added a "Require Min. 2 Failed Edges for Neighboring Normals" option (Settings: File/Other/Mesh Checking), previous behaviour was as if this option was on
- Changed Suction/Gripper/Shovel marker from an X to a circle
- Added solid shading for Faces
- Added Curve Break functionality to Modify tab
- Added Geometry Intersection functionality to Modify tab

## ***Post***

- Added reading of Constraints for Nastran
- Added Tool Wearing variables

# OpenForm 2.0.3 (2014-01-16)

## Bugs

### *General*

- [2014010758000226] Fixed crash at exit when using GNS license server
- Fixed crash in Chinese version when not using UTF-8 locale
- Fixed "Arbitrary Point" not working in Pick Point tools

### *LS-Dyna*

- Fixed Trimming Steps, where 'endtim' parameter was missing

### *Process*

- Fixed disabling certain Step Parameters that are treated as Main Parameters
- Fixed saving GDB with "Only Visible" if Swept Surfaces existed and were visible

### *Post*

- Fixed crash while 4 Views showing, hiding a Process from a view, then unlinking variables
- Fixed crash when editing the Display/Post/Process Information Line Format in the Settings dialog

## Improvements

### *General*

- Added licenses available/used information in About dialog for the RLM license server



# OpenForm 2.0.2 (2013-12-19)

## Bugs

### *General*

- Fixed crash reporter not working properly on Windows

### *LS-Dyna*

- [2013092758000079] Fixed the exported Iges files, so LS-Dyna doesn't crash
- [2013092758000079] Fixed the curves written when using the keywords {TRCURX}, {TRCURY}, {TRCURZ}
- [2013121758000206] Fixed material file being deleted when running an LS-Dyna simulation if "Copy Material" is turned on and material is already in the export directory
- Fixed Local Coordinate Systems exported to LS-Dyna - the X coordinate of the third point was incorrect

### *Process*

- [2013121758000215] Fixed crash when running simulations on Linux
- Tool Icons are drawn based on the local coordinate system, not the global

### *Mesh*

- Fixed some Faces being incorrectly destroyed when using Topology

## Improvements

### *Post*

- Updated the known supported Autogrid version number to 5.1

# OpenForm 2.0.1 (2013-12-14)

## Bugs

### *Process*

- Fixed crash on Windows when opening Material Dialog while certain file names existed in the Indeed mat
- Fixed crash when dropping a Multi Drawbead on the Process

# OpenForm 2.0.0 (2013-12-09)

## Bug Fixes

### General

- [2013100258000032] Fixed recognising errors when reading a faulty GDB, when OpenForm crashed while writing the file
- Fixed view if showing a larger part of the model after performing a Fit to Window - parts of the model were being clipped

### LS-Dyna

- Fixed exporting the Local Coordinate System - X & Y were vectors, not coordinates
- Fixed Blank Trias being converted to Quads when writing simulation
- Fixed templates for initial movement for normal Deep Drawing

### Process

- Fixed crash when changing Step type
- Rename old template files when installing Windows version - stops Template items from appearing multiple times
- Item's "Move Vector" wasn't being taken into account in Animation Preview
- Fixed Tools not being reused after deleting an Operation and dropping a new one
- Fixed allowing "Time Control" for User Defined Step types
- Fixed Process names in the Template List - they were being cut off if too long

### Post

- [2013062658000022] Fixed showing Thinning variable for Autogrid results
- Fixed importing Yield Criterion and Global Stress variables from Nastran
- Fixed missing variables when the "Read multiple variables at once" setting is on (Settings: File/Post/LS-Dyna Import)

## Improvements

### General

- [2013072558000095] Added user modifiable File Extensions (Settings: File/Files/File Extensions: Modify Read/Write)
- Updated to Indeed v9.2.6
- Added support for RLM license server
- Added an OpenForm.cfg where environment variables can be set on Windows
- Improved translation with the mouse - the model now tracks the mouse movement exactly
- Session Command actions can have multiple commands, separated by ','
- Added option to write session & message files (Settings: File/Files/Session)
- Added a Visualization tab in Settings: Display
- Renamed Show Item Edges to Show Element Free Edges (Settings: Display/Visualization/Show Element Free Edges)
- Added Feature Lines (Settings: Display/Visualization/Show Feature Lines)
- Added ability to turn on/off the Bar end points (Settings: Display/Visualization/Show Bar End Points)

- Added another option for the "Synchronize Input/Output Directories" setting (Settings: File/Files/Directories) - "Only Output Directories"
- Added a default Solver for each Forming Type (Settings: Solver/General/Default Solver)
- Added an auto detect image format for Take Snapshot
- Added ability to lock entire Settings Groups in LockedSettings.conf file

## **LS-Dyna**

- [2013072558000086] Added setting for exported file names (Settings: Solver/LS-Dyna: LS-Dyna Mesh File Name, LS-Dyna Step File Name)
- [2013072558000111] The exported CASE file (<filename>.k) is now a modifiable template
- Added templates for the Cooling Step in a Hot Stamping simulation
- Initial implementation of SVS Sandwich Blanks
- "Refinement Time Interval" is now a fraction of the Step duration (0 - 1.0), rather than the time itself
- Added option "Add to dynain file", with values "Tools", "Tools if Initial Temperatur > 0" and "No Tools" (Settings: Solver/LS-Dyna/Add to dynain file)
- Treat a "Move" controlled Tool the same as a "Stationary" Tool
- Added description above the Template text, describing the behavior of the Template
- Added keyword {PREMOV}, improving the Initial Movement for Deep Drawing simulations

## **PAM-STAMP**

- Added ability to export to PAM-STAMP if not converted from Autoform
- Added the ability to run a detached simulation (Run/Run Detached PAM-STAMP Simulation)
- Decreased "Stop When Progression" time for Trimming Steps from 1e-6 to 1e-9
- Added Rezoning Zones (Local Regions)
- Added ability to export for different versions
- Added parameter "Speed Up"
- Added export of Wedges, as degenerated Hexas
- Changed default unit system from "mm.kg.ms" to "mm.t.s"

## **Autoform Conversion**

- Added "Trimming Type" and "Trimming Step" options
- Added "No Friction in Gravity and Springback Steps" option
- Widgets in "Autoform Conversion Settings" dialog are disabled if the settings are locked

## **Process**

- [2013072558000148] Added a "Position" Main Parameter for Tools - the distance along the working direction, which is coupled to the "Translate Mesh" in Mesh view
- Added support for material Tribological System (Settings: Solvers/General/Tribology Configuration File)
- Can change visibility of Items in Item List while "Finished Piece Coordinate" is being set
- Added arrows to show direction of variable Drawbeads
- Added an "Automatic" filter for the Open dialog - the format will be based on the file extension
- Materials sorted alphabetically in Material Library list
- Changed color of the "Single Action Press/Double Action Press" drop down menu, to be distinct from Template buttons
- Added setting to treat Item Step parameters as Main parameters (Settings: File/Other/Item: Step Parameters to Treat as Main Parameters)
- Can modify variable Drawbead points via mouse
- Drawbead Rod & Notch no longer have Control parameters - they have a Master Tool and take all their parameters from that Tool

## **Mesh**

- Can select Suction nodes by entering Node id or coordinates
- Mesher Rules now contain the Mesher Type as well
- Can drag points selected when meshing via Polygon
- Added ability to translate the Conveyor Belt mesh
- Extended "Meshing Rules" (Settings: File/Other/Meshing Rules) to have equations for all parameters, not just length
- Added polygon selection for "Modify" commands
- Added visibility & style icons to the Items in the Geometry Data list
- Added an "Automatic" filter for the Open dialog - the format will be based on the file extension
- Can measure distance between Properties with Distance tool

## **Post**

- Added "Follow Nodes" tool (Tools/Follow Nodes)
- Added loading of PAM-CRASH Scalar Variables
- Added more options to "Scale Orientation" (Settings: Fringe/Mode and Range/Scale Orientation) to reverse the colours
- Only show Blanks in FLC legend if Process is currently active
- Added a "Max" layer for Principal Strains and Stresses
- Added default layers per variable (Settings: Fringe/Variables: Default Layers) and an option to decide which layer to show when switching variables (Settings: Fringe/General/Interface: Upon switching Variables)
- Added File/Export Results to export results to a CSV file
- Contact names are used as Item names when reading LS-Dyna intfor results
- Added a "Succeeding" Slider position calculator (Settings: Display/Post/Method to match multiple models for Slider: Succeeding) - simulations play one after the other

# OpenForm 1.13.4 (2013-10-07)

## Bug Fixes

### *Press Transfer*

- Fixed alignment of values written out to conveyor belt file
- Forced display of decimal point when exporting conveyor belt if whole number
- Fixed incorrect error message when checking if simulation should be exported
- Fixed writing the roller speeds to the conveyor belt include file

### *Process*

- Fixed crash when dragging from the Process preview tooltip
- Removed no longer existing "OFPL/Cutting Control" from SimplifiedParameterView.xml - this was replaced by the Process Main Parameter "Finished Piece Coordinate"
- Fixed the positioning of the Drawbead Nut & Rod icons - they were overlapping other icons
- Highlight the currently selected Drawbead when editing the force from within the Simplified view
- Fixed exporting an SAP Closing Step to Indeed if Binder is Force controlled

### *Mesh*

- Changed "Min Gap" to "Min Length" when meshing a Drawbead or Trim
- Fixed "Min Length" when meshing a Drawbead or Trim from a Curve
- Increased default "Min Length" when meshing a Drawbead or Trim to 0.01
- Fixed possible crash after using Modify/Element/Mirror
- Fixed crash when creating Blank Supports and Guide Pins and setting the value of the Arc Gap to be a large value

## Improvements

### *Process*

- Added "Finished Piece Coordinate" to the SimplifiedParameterView.xml for the "Process/Operation/Step" page

### *Mesh*

- Blank meshing is now done in the first Operation's local coordinate system instead of the global XY plane

### *Post*

- Added a "Force Item Name" option to import of STL as external mesh

# OpenForm 1.13.3 (2013-09-06)

## Bug Fixes

### *Process*

- Step Initial Movement parameter is no longer elided
- Fixed Item parameters for incorrect Step being modified when changing values in Parameter Editor if Item was added to a new Step

### *Mesh*

- [2013081658000038] Fixed program hanging while meshing certain Iges examples
- Fixed Modify Mesh/Scale Mesh - X value was being used for Y
- Fixed crash when user stops the meshing of a Tool

## Improvements

### *General*

- Updated to Indeed v9.2.5

### *Process*

- Added ability to import and export Indeed CONTACT\_PRESSURE
- Items can be coupled to Coupled/Force and Coupled/Pressure tools
- Highlight the currently selected Drawbead when editing any Drawbead

### *Mesh*

- Added a "Min Gap" when meshing a Drawbead or Trim

# OpenForm 1.13.2 (2013-08-14)

## Bug Fixes

### *General*

- [2013062658000031] Fixed crashing when opening OpenForm on windows machines with a spacemouse
- Fixed not saving Post data when saving GDB in Pre and vice versa
- Fixed crash when showing Nodes if "Show Item Edges" is turned on
- Fixed duplicate Operations appearing in the Item tree when Operations are removed if Hierarchical option used

### *PAM-STAMP*

- When exporting an "Until Closed" step, Binders takes precedence as the target tool
- Import of "Until Distance" now matches exporting (exporting changed in 1.13.1), Distance is the target position rather than distance moved
- When exporting a moving Tool, the Tool's direction in that particular step is used instead of the Tool's default direction

### *Post*

- Fixed crash when setting max value of Fringe Scale

## Improvements

### *General*

- Restricted the width of main and comment parameter list items and tooltips
- Update Drawbead Item Info as the discretization changes
- Added start/end text for variable Drawbead information

### *Autoform Conversion*

- Added reading of CombinedSH keyword from material files

### *OFPL*

- Added importing and exporting of Finished Pieces
- Added control parameter "Element To Thickness Ratio"

### *PAM-STAMP*

- Trimming steps are now exported as an explicit calculation using stage type "HOLDING" instead of "SPRINGBACK"

### *Process*

- Blank Material only shows text for current Solver
- Added all Tool types to "Change Tool Type" menu
- Modified drawing of Rod/Notch icons for Single Action Press
- Highlight the currently selected Drawbead when editing a Multi Drawbead



- Added setting for Split View action in UserSettings.conf (View/Split\_View)
- Improved error message when simulation fails to run

### ***Mesh***

- [2013072558000121] Added saving of further Scale Blank settings
- Allow selecting of points on screen when meshing via a polygon

### ***Post***

- Added "Thinning %" Variable

# OpenForm 1.13.1 (2013-06-12)

## Bug Fixes

### *General*

- Labels created in Post no longer appear under Process/Mesh and vice versa
- Fixed error when translating in view while nothing was displayed - if something was loaded later, it wasn't shown

### *Autoform Conversion*

- "Show Conversion Settings" option in File Dialog was being ignored

### *LS-Dyna*

- [2013072558000077] Split long INCLUDE filenames over multiple lines

### *PAM-STAMP*

- Fixed the R-Values for the User materials
- Fixed "DEF\_OBJECTS /COUNT = " value - wasn't including exported Drawbeads
- Fixed adding Trims to certain Steps
- Fixed initial movement of Coupled/Force Tools
- Fixed initial movement of Non-Stationary Tools when using "Blank & Non-Stationary Tools to Stationary Tools"
- Guidepins are no longer used for the "Until Closed" calculation

### *Process*

- Fixed crash when reading Indeed Process if Selectable Colors only contained transparent colors
- Fixed exporting an SAP Closing Step with two Binders to Indeed
- Fixed recognising certain errors when running Indeed simulations - error was being ignored, and simulation was said to have finished successfully
- Fixed error when undoing, then redoing a Process drop - two Processes were created
- Fixed error that saw coupled Tools being decoupled when a new Tool was dropped
- Fixed incorrect warning message when exporting a User Material from the Material Dialog under Windows - file was actually exported
- Fixed running a simulation when the name contained a period ('.') - the name used for the simulation was incorrect
- Fixed Multi Drawbeads losing their mesh after importing, then pressing Undo, Redo

### *Mesh*

- Fixed importing Indeed t51/2/3 files if they didn't have the correct file extension
- Fixed deleting of geometry Files in Geometry Data List - Faces needed to be deleted before Cons
- Fixed meshing Blank from CAD Curves if curves weren't in XY plane - projection of curves wasn't onto the XY plane

### *Post*

- [2013053158000078] Fixed crash when reading certain Autogrid results
- Fixed reading FEMZIP LS-Dyna results

# Improvements

## **General**

- Added 'Element' option to Pick dialog
- Removed logo from left hand side of Main Menu

## **Autoform Conversion**

- Added ability to scale Tool velocities
- Added Time Control: Convert to Until Distance option
- Changed wording in Conversion Settings dialog to remove Indeed references

## **LS-Dyna**

- Added keywords {DBCURX/Y/Z/N} for the curve of a Drawbead
- Added keyword {STGDIR} for Step gravity direction and using it in Gravity template
- Improved Deepdrawing and Hot Stamping templates

## **PAM-STAMP**

- Added conversion of Autoform material files
- Added a Material Library option for the materials
- Symmetry is now export as DEF\_SYMMETRY\_PLANEs instead of DEF\_BOUNDARY\_CONDITIONS\_ON\_POINTS

## **Process**

- Added support for Drawbead "Uplift Force"
- Added new Trim type "Auto" - references "Finished Piece Coordinate" in Process Main Parameters  
Note that this replaces the OFPL "Cutting Control/Finished Piece Coordinate"
- Added extra Drawbead templates for variable Drawbeads
- Added settings to define the Process name and Simulation directory in terms of the Project Data parameters (Preferences/File/Other/Process Name based on Project Data, Simulation Directory based on Project Data)
- Double clicking on a Tool icon pops up a dialog to edit basic control information
- Simplified Parameter View
  - ◆ Added Process, Operation and Step type tables
  - ◆ Added a "Simplified Control" option for the Tools
  - ◆ Added <Info> tag for the Item type tables (displays the current Step or Operation)
  - ◆ Added a <ToolControlType> tag for the Item type tables to show only Tools with certain control types
  - ◆ Sorting Simplified or Combined Control will place Stationary Tools at the bottom of the list
- Added support for the Indeed parameter CUTERG (Solver Parameters: Trimming Control/Debug Output)

## **Mesh**

- Improved Blank meshing when using Refine Edges

## ***Post***

- Added importing of Indeed inkaktl.bin/asc files (selecting this file will create a Process with a single Increment)
- Node' or 'Element' is the default in the Pick dialog, depending on the current Variable type
- LS-Dyna material files can be imported for the FLC in the FLC dialog
- Improved speed of reading LS-Dyna results, especially when many curves exist

# OpenForm 1.13.0 (2013-04-30)

## Bug Fixes

### *General*

- Fixed some issues when using indirect (remote) rendering
- Send a warning if Action cannot be found in Shortcuts.xml
- Fixed reading a session file when points in the format {points="item(BLANK):(1,1,1), (2,2,2)"} existed
- Fixed crash under Windows if Visible Item Info was used, then exiting the program

### *Autoform Conversion*

- Fixed importing PilotGroups
- Autoform materials are added for all Solvers when importing an Autoform simulation

### *LS-Dyna*

- Allowing mixing "Until Distance" and "During Time" controlled Steps when exporting
- Fixed Time Control Modelling/Until Distance template

### *OFPL*

- Fixed exporting a Tool's position relative to another Tool - it was always positive
- Fixed incorrect geometry directory if filename contained a '.'
- Fixed importing & exporting where we have two velocity Tools in a Step, one waiting on the other

### *Press Transfer*

- Added check for valid material when exporting
- Fixed renumbering of the Finished Piece when exporting
- Fixed writing values of "1000.01" to a Nastran file - "1000" was being written

### *Process & Mesh*

- Fixed cross section lines not being updated

### *Process*

- Fixed exporting Multi Drawbeads to Indeed under Linux - all drawbeads had the same name
- Fixed Item materials read from a GDB under Windows if material path was in UNC format (//<server>/)

### *Mesh*

- Fixed crash under Windows when deleting points in Points List (e.g. in Add Mesh/From Polygon or Multi Guidepin point list)
- The "Blank (non flat)" mesher can mesh CAD Curves that aren't in the XY plane
- Show an error if the Blank/Tool mesher fails to produce a mesh
- Fixed possible crash when reading faulty Nastran files
- Fixed possible crash when reading in certain Iges files
- Fixed Check Mesh finding doubled Elements when two Properties have Elements that share Nodes

## **Post**

- Fixed displaying certain rezoned LS-Dyna results - some nodes had incorrect displacements in some increments
- Fixed a potential crash when deleting curves in the Cross Section Plot dialog
- Fixed attempting to delete a label in one view, and actually deleting a label in the same position in another view
- Fixed reading Autogrid file  $\geq$  v4.2 where the 'm' value is greater than 99
- Hide User Variable dialog when leaving Post
- Fixed matching Plot markers for LS-Dyna results if X Axis was showing Increments
- Fixed Wrinkling variable for 1st Principal Strain  $< 0$

## **Improvements**

### **General**

- [2013031958000131] Send a warning about incorrectly interpreted legacy Settings
- [2013031958000131] Send a warning if obsolete and new Setting names both exist
- Show the file imported/exported in the info message
- Settings "License\_Server", "Indeed\_License\_Server", "Indeed\_License\_File" and "Indeed\_Material\_Library\_Directory" moved from ProgramSettings.conf into UserSettings.conf (note that for compatibility reasons they will still be read from the ProgramSettings.conf if they do not exist in UserSettings.conf)
- Added recognition of GNS\_LICENSE\_SERVER environment variable for the license server (checked after OPENFORMLIC)
- Can handle multiple license server environment variables, e.g. OPENFORMLIC=server1, OPENFORMLIC1=server2
- Added ability to change language of program - Settings/Set Language
- Settings in format "{name[1]=name1,value[1]=value1,name[2]=name2,value[2]=value2}" no longer need to be in consecutive numerical order - "{name[name1]=name1,value[name1]=value1,name[2]=name2,value[2]=value2}" is possible
- Updated to Indeed v9.2.4

### **Press Transfer**

- Enable picking and selecting nodes and elements on the Conveyor Belt
- Ignore duplicate angles (0 & 360) in input data for Transfer Curve
- Adding reading of x values for Transfer Curve from CSV input
- Handle Rotation information in Transfer Curve input data
- Allow a single step to be defined for Press Transfer Simulation
- Modified exported pamcrash files to have the "inc" file extension
- Added exporting of PAMCRASH material for the dropoff step
- Only export filename and not full path for items referenced in the Press Transfer
- Added exporting of Roller Speed for the dropoff step
- Added exporting of the Suction/Gripper/Shovel Items
- Added handling of THICK, BASE, OP and NAME markers for Templates
- Show the current values of the Press Transfer templates in the Settings Dialog

### **LS-Dyna**

- Added keywords {TRCURN}, {TRCURX/Y/Z} for the points of a Trim curve
- Added a "Uniform" option to the Refinement Mode, and added Step Refinement templates for "Uniform" and "Adaptive" options
- Added Step Refinement Control templates

- Added templates for Symmetry and Constraint Items
- All float values exported now have a decimal place

### ***Process & Mesh***

- Don't draw internal faces of Solid volume elements - improves look of the elements
- Added View/Show Item Edges option, the same as Post

### ***Process***

- [201303145800041] Default value for Scale Blanks in Process Main Parameters set to (1,1,1)
- Added a simplified parameter editor - use <installdir>/Settings/SimplifiedParameterView.xml to configure
- Can modify the Local Coordinate System vectors manually by typing in vectors
- Material Dialog defaults to something (Library or File) if no material has been defined

### ***Mesh***

- Added ability to translate Finished Piece into contact with Conveyor Belt
- Added a combo box to choose the Solver when meshing Blanks and Tools
- Selecting Nodes instead of Points for Sucker/Gripper/Shovel
- Added option to import and export points for Multi Guidepins, Constraints, etc
- Added Thermal Scaling option to Blank task "Scale"

### ***Post***

- Can change the X Axis in the Tool Plot Dialog, allowing a Force vs Displacement graph
- Improved the "Read in Recommended" for Increments, and allowed it to be specified in a command
- Added Nastran and Pamcrash plugins for reading results
- Made "Read multiple variables at once" Option false by default
- Improved rendering speed of large amounts of text

# OpenForm 1.12.0 (2013-03-01)

## Bug Fixes

### *General*

- Stopped multi line labels from reappearing in strange places once off the screen
- Fixed rendering of certain Chinese fonts for some sizes
- Fixed displaying Chinese fonts in Executable help

### *Process*

- Fixed exporting for Indeed versions other than 9.2.x

### *Mesh*

- Fixed style of undeleted Elements, if style was changed while they were deleted

### *Post*

- Fixed position of min/max triangles on Fringe Scale if Scale Orientation is "Min Bottom, Max Top"
- Fixed PAM Mapping export not exporting variables if "Only Blanks" is turned off, "Only Visible" is turned on and Tools aren't shown
- Fixed updating the Formability variable after changing Scale
- Fixed FLC renaming to make sure there are no duplicated FLC names
- Fixed importing Indeed < v8.0.4 results - variables weren't being found

## Improvements

### *General*

- Modified Solver Executables so that the arguments for the Executable are defined by the user, using given variables
- Can copy & paste built in Actions
- Added the ability to export the Cross Section lines
- Added a "Volume Element Layer" option to the Cross Section Dialog
- Added "Detached" simulation jobs concept - used for running Springback and OFPL jobs

### *Autoform Conversion*

- "Join Patches" option is turned on by default
- Drawbeads have the inverse of the Tool's movement applied if "Apply the Tool's Movement Value" option is not set

### *OFPL*

- Using curve type 126 when exporting Trims and Drawbeads to Iges files

### *LS-Dyna*

- [201211015800025] Split "Blank and Tool Contact" template into individual Tool types
- Added {TODIRS} keyword for the tool's direction sign
- Added a "First Step" template for the initial Blank temperatures



- Added "Until Distance" Time Control option
- Added {STRFMO} for Refinement Mode
- Added Step Solver parameters with keywords for use in the templates
- Added Thermal Material to Tools and Blanks for Hot Stamping simulations
- Added {SENONT} keyword for the initial temperature of newly active tools
- Added {STMTVE} keyword for the fastest moving Tool in a Step
- Using curve type 126 when exporting Trims and Drawbeads to Iges files
- Updated the Hot Stamping Templates

### ***Process***

- Added a "Scale Blanks" parameter to the Process for Hot Stamping simulations
- Can write Indeed v9.2.4 Keeler FLC Curves for Material Parameters materials
- Young's Modulus and Density are initialized to Steel for Indeed Material Parameters materials
- Indeed 'Material Parameters' materials have a Keeler curve by default
- Sandwich Blanks now obey the Material configuration file option

### ***Mesh***

- [2013012358000073] Added a Jacobian Ratio check to "Check Mesh"
- Added Meshing Rules for the element length when meshing a Blank
- Added exporting of the Finished Piece for Press Transfer Simulation
- Added exporting of the Conveyor Belt for Press Transfer Simulation
- Added "Rotate to vector" option in "Rotate Mesh" task
- Added "Scale Mesh" task

### ***Post***

- Added import of PAM-CRASH files as External Mesh
- Can read Indeed v9.2.4 Keeler FLC Curves
- Added a "Vector Value" to the Pick Point command
- Added a Comparison Modes "Mapped" and "Distance" (Distance was part of "Difference" mode)
- Handle deleted elements from LS-Dyna results
- Can now read more LS-Dyna variables, not just the variables OpenForm recognizes
- Added an option to load multiple LS-Dyna variables at once using the Dyna3d plugin (see Preferences/File/Post/LS-Dyna Import - Read multiple variables at once (Experimental!))

# OpenForm 1.11.1 (2013-01-29)

## Bug Fixes

### *General*

- Fixed displaying Chinese fonts in OpenGL on Windows

### *LS-Dyna*

- Fixed using "LS-Dyna-Hot Stamping" templates when using creating a Hot Stamping Process

### *Process*

- Fixed crash when attempting to drag an Operation template, but selecting the Step or Item instead
- Fixed Gravity value for Indeed when using Internal Material (was 7.71783E-10, now 7.71783E-5)

### *Mesh*

- Fixed "Only Visible" option when exporting to PamCrash

### *Post*

- Fixed setting a single Scale for Variables if the Scale contained a comma
- Fixed exporting of rezoned LS-Dyna and Autoform results to Iges/Indeed t51/Autoform
- Fixed crash when deleting external Items then reading again
- Fixed not being able to right click external Items in Hierarchical List
- Fixed crash if a User Variable relied on a User Variable which relied on a User Variable, and deleting the first User Variable
- Fixed User Variable disappearing if it relied on a User Variable, and the first User Variable was edited

## Improvements

### *General*

- Added --write-default-settings (was --write-settings) and --write-current-settings arguments

### *Process*

- Added regular expressions to Project Data String type parameters

# OpenForm 1.11.0 (2012-12-17)

## Bug Fixes

### General

- Fixed crash when using Cross Section Dialog with "Hide Geometry" and using a Calculate tool
- Fixed showing of Remote Indeed Simulation Dialog when starting program and remote simulations exist
- Fixed running exportMesh(), writeSimulation(), save() and runSessionFile() commands on Windows via a session file, if filenames had a "...\\n..." in the path

### Process

- Read hardening rules from Indeed mbl files
- Read Keeler FLC from Indeed mbl files
- Importing an Indeed dat file exported from a Feasibility Process now creates a Feasibility Process

### Mesh

- Fixed drawing of moved/deleted/created Elements when using "OpenGL Indirect" renderer
- Fixed Curve positions not updating after undoing Move

### Post

- Fixed reading of Rezoning Zones - they were inactive in all Steps
- Fixed reading of certain LS-Dyna intfor files
- Fixed reading of LS-Dyna curves for certain examples
- Fixed updating FLC Dialog points when the layer changes
- Fixed drawing of cross section lines when using "OpenGL Indirect" renderer

## Improvements

### General

- Added a batch version (note: Graphs in Post do not work) - under Linux run script with '-b', under Windows run the OpenForm\_batch.exe executable
- Added options to use random colors for all Items (Preferences/Colors/Other Colors/Items)
- Constant Drawbeads are drawn with the same Item Info as variable Drawbeads
- Changed default font so that it is consistent between platforms and batch/non-batch versions
- Added commands to control Cross Section Dialog
- Added commands to control Simulations
- Added ability to lock settings from being changed by user: in LockedSettings.conf, "Per Session" means the user can modify the setting, but it isn't saved; "Full" means the user cannot modify the setting in the GUI or via a command
- Added filtering of Actions and Shortcuts in Preferences Dialog
- Can change heights of two lists in the left hand Dock Widget
- Added Help button when defining local executables and remote scripts
- Added example local and remote scripts to run simulations (<installdir>/Docs)
- Added option to show hierarchical Item List (Preferences/Display/General/Item List)

## **Autoform Conversion**

- Added conversion of materials to LS-Dyna materials
- Added reading of new Variable Drawbead format
- Added support for Meshing Rules for the Blank Element Length (Preferences/File/Other/Meshing Rules)
- Added an option to not apply the 'Move' value for a Tool

## **Simulations**

- Moved "Number Cores" from the Executables to the Run Simulation Dialog

## **LS-Dyna**

- Can run a local and remote LS-Dyna simulation
- Added Solver Control parameter for number of integration points for Sandwich Blanks (removed setting from Preferences Dialog)
- Added TOCFID keyword and using it in the Initial Movement templates to move Coupled Tools
- Using \*KEYWORD\_JOBID instead of \*KEYWORD\_ID in template "Process Modelling/Start"

## **Process**

- [2012112858000109] Can export a Process for any Solver
- View Simulation dialog is now searchable (using Ctrl+F)
- Added support for Coil and Gas Spring Supported Tool control types
- Added ability to define a Local Coordinate System for Operations, Tools and Trims - these are exported to LS-Dyna and OFPL
- Added a "Move To Tool" parameter for Tools for the initial positioning when using OFPL
- Added a "Wait On Tool" parameter for Tools for the initial positioning when using OFPL
- Added a configuration file for Blank materials & FLD files for all solvers, not just for OFPL - this can be turned on and off via a Setting (Preferences/Solver/General/Materials)
- Added option to only display FLCs from configuration file that match the selected Blank Material (Preferences/Solver/General/Material Configuration Files/Only list FLCs...)
- Added ability to group Materials and FLCs in configuration files (see Preference/Solver/Material Configuration Files for format)
- Added ability to define LS-Dyna User Materials
- Moved Symmetry "Direction" parameter into Main Parameters
- Added handling of Indeed NO\_MBL materials
- Added Material parameters to Finished Piece for Press Transfer Simulation
- Added Indeed Solver parameter "Contact/Blank to Blank Contact"

## **Mesh**

- Added "Attempt Automatic Mesh Allocation" option for Pamcrash files
- Added "Use CAD Normals" option to Element/Offset
- Added ability to show/hide Cons in Geometry Data list

## **Post**

- Added commands to create, edit and delete Cross Section Plots
- Added commands to create and delete History Plots, and to export curve data
- Added commands to control User Variables
- Added Tool velocities and accelerations from LS-Dyna results to the Tool Plot Dialog
- Added setting of allowable Scales per User Variable

- Added reading of multiple Autoform increments from AF-Print files
- Added an "Only Blanks" option to PAM Mapping export - can now export any Items with shell or solid elements

# OpenForm 1.10.1 (2012-10-31)

## Bug Fixes

### *General*

- Fixed deleting of user labels
- Fixed setting of shortcut when creating/editing an Action
- Fixed the translation of all Actions in Chinese version

### *Autoform Conversion*

- Drawbeads move with "Master" Tool listed in .inp file

### *OFPL*

- Tools coupled to Stationary Tools are considered in the positioning of Blanks
- Guidepins are no longer considered in the positioning of Blanks
- ROD & NOTCH have been renamed DRAWBEAD\_ROD and DRAWBEAD\_NOTCH
- DRAWBEAD\_STICK is now recognised as DRAWBEAD\_ROD & \_NUT is recognised as \_NOTCH

### *Springback*

- Fixed writing Indeed ASCII output instead of Binary
- Fixed unchecking the Run Springback action when closing the Run Springback dialog

### *LS-Dyna*

- LS-Dyna materials are exported at end of deck, to allow setting of a scale factor
- Fixed Templates for Initial Movement & Sandwich Blank

### *Process*

- Fixed Rod & Notch icons
- Fixed showing of Single Action/Double Action press combo box in Chinese version
- Fixed showing of templates in Chinese version
- Fixed loading of Item visibility and style from GDBs saved with v1.9, if Items were in Boundary style
- Fixed drawing of Insert icons when control type changes per Step

### *Mesh*

- [2012102658000052] Fixed GDB saving and loading of Guidepins

### *Post*

- Fixed loading User Variables from a GDB
- Fixed crash when creating a User Variables using the Increment Displacement vector variable

# Improvements

## *Process*

- Renamed Rod and Notch templates to Drawbead Rod and Drawbead Notch

## *Post*

- Added reading of LS-Dyna intfor results file

# OpenForm 1.10.0 (2012-09-28)

## Bug fixes

### *Process*

- Fixed color of Constraint if defined using a line
- Fixed crash when pressing Delete button when no Process exists
- Fixed Animation Preview not working when Multibeads exist

### *Process & Mesh*

- Stopped writing of t52 file when exporting only Blanks to Indeed t51

### *Post*

- Fixed projecting of Drawbeads and Trims
- Fixed Thickness Change % from being NAN in certain LS-Dyna results

## Improvements

### *General*

- Added an option to use a native File Dialog under Windows - should be quicker (File/Files/FileDialogs: Use native Windows file dialog)
- Added environment variable \$GNS\_SourceFile for the originating file of a Process - can be used in a user defined script
- Added an option for the recognised LS-Dyna file extensions (File/Files/LS-Dyna File Extensions)
- Ask user if a non-existing Recent Document should be removed from the list
- Changed user definable Run Menu to user definable Actions, Menus, ToolBars, Widgets (in Mesh & Post) and Right Click Menu. They are no longer saved in the Settings/UserSettings.conf file, they are saved in the Settings/Actions/ directory (local Settings will be converted to new, and old global Settings will continue to be read correctly).  
The Menus no longer appear under "Run", they appear as separate menus between "Run" and "Help".  
The Menus, ToolBars, Widgets and Right Click Menu can be defined for each screen (Process/Mesh/Post/etc), using any user defined or built in Action.
- Added a user definable label (View/Create Label)
- Improved speed of indirect rendering - using DisplayLists where possible

### *Press Transfer*

- Added initial Press Transfer functionality

### *LS-Dyna*

- Using \*KEYWORD\_ID instead of \*KEYWORD\_JOBID
- Added support for Until Closed time control modelling
- Added support for Initial Movement modelling
- Added keywords {DBCUID}, {DBTOID}, {DBIGSF}, {DBTODX/Y/Z} - for exporting of Drawbeads
- Added keywords {DBCUID}, {TRIGSF}, {DBTODX/Y/Z}, {TRRMFL} - for exporting of Trims
- Added keyword {TOCTID} - part id of the coupled Tool
- Added keyword {BLMAXT} - maximum blank thickness



- Added keyword {SEPTST} - Part Set of stationary Tools
- Added option to copy Material files into the export directory
- Attempt to use relative path for Blank material file

## **OFPL**

- Added material & flc configuration files - choice of material/flc is made via a combobox rather than the material dialog

## **Indeed**

- Added Indeed's Drawbead Force vector variable

## **Process**

- Changed the Insert Die/Punch icons depending on the Control type (Stationary/Velocity/Spring Supported for Die, Stationary/Velocity for Punch)
- Added Rod and Notch Tool types (physical drawbeads)
- Added Blank Supports
- Added Sandwich Blank (only for LS-Dyna)
- Blank Element Size & Refine Edges is again available in the AutoForm conversion dialog

## **Mesh**

- Added Aspect Ratio & Arc Gap variables when meshing Guidepins
- Can select Elements via Iges file Face Group - Elements are colored based on the Face Group
- Color Elements when selecting via Mesh Region
- Added option to input dimensions for Add Mesh/From Rectangle

## **Post**

- Added option to decide which Fringe Scale to use when switching variables (Fringe/Mode and Range/Upon switching Variables)
- Added Signed Distance between A & B for the comparison
- Added option "Increment=Last" to command open()
- Added a command to set the current Fringe Scale
- If the Thickness Change % variable doesn't exist, calculate it from the 3rd Principal Strain
- Added ability to import LS-Dyna user defined history variables
- Added a setting to stop the reading of LS-Dyna input decks when reading results (File/Post/LS-Dyna Import: Read input deck for information)
- Added commands for the FLC dialog - import, create, rename, delete, set color, set visible, assign to Blank
- Added ability to transform single Items (Tools/Transform Items)
- Added ability to reverse orientation of Fringe Scale (Fringe/Mode and Range/Scale Orientation)
- Added header info to exported XY Plot files
- Added commands to open and control XY Plot dialogs
- Added ability to scale XY Plot graphs
- Added LS-Dyna "Contact Force" to the Tool XY Plot dialog
- Added two new environment variables - \$GNS\_StepClosingTool and \$GNS\_StepDistanceToHome
- Added an Action (Tools/Set Closing Tool) to set the Closing Tool for the current Step

# OpenForm 1.9.1 (2012-08-27)

## Bug fixes

### *General*

- Fixed deleting old Process results when rerunning a Local Simulation from same directory

### *Process*

- Do a fit to window when selection a vector from a curve and view was empty before showing curves
- Fixed 'dyn' extension not being written when exporting an LS-Dyna Simulation

### *Mesh*

- [2012080758000066] Fixed incorrect offset after meshing certain Faces
- Fixed "Only Visible" when exporting to Iges

### *Post*

- Corrected Autoform Thickness Change variable - is now %
- Fixed a crash when reading Layered Sandwich LS-Dyna results
- Removed non-functioning "Transform External Mesh" right click menu item in Items List
- Fixed selection of a point in FLC diagram if both Node & Element FLC variables from different Processes are being shown
- Fixed creating Thickness Change variable for some LS-Dyna results - if input deck can be found, or if thickness is found in the results
- Fixed unpinning increments using the "Show Reference Increment" button, and deselecting an increment for a single Process
- Fixed a crash when reading Element or Node ids from session file for Indeed results

## Improvements

### *General*

- Updated to Indeed v9.2.3

# OpenForm 1.9.0 (2012-07-23)

## Bug Fixes

### General

- Fixed Distance Normal for an arbitrary point with Bars
- Fixed drawbeads on top using too thin a line
- Fixed reading Guidepins from old (< v1.8) gdfs

### Process

- Fixed crash when editing the force column of the last row (new row) of the drawbead force table
- Don't delete the previous results in Post if the simulation is being run again but in a different directory

### Mesh

- Fixed Auto Mesh Allocation dialog being shown if the option is deselected after pressing cancel in the dialog and opening another file

### Post

- Fixed bug where when running a simulations, the FLCs that were read in were not being applied
- Fixed reading Indeed results with multiple Items and different FLCs
- Fixed reading of LS-Dyna messag, and therefore input, when reading results from current directory
- Also look for d3hsp in FpLSDynaSolverInfo when looking for input deck, not just messag
- Fixed calculated thickness variable (Thickness Change % or Thickness) if thickness is zero

## Improvements

### General

- Added Commands for Calculation, BoundaryTrajectory, Show Min/Max, Load View, Comparison, Post Curve Tool
- Changed format of some settings to be more readable. Settings changed have been renamed, such that the old setting still exists, so older versions of OpenForm will be able to read the old setting.
- Added a full UserSettings.conf file to the <installdir>/Settings/ directory

### OFPL

- Changed keyword names (WAY->DISPLACEMENT, PLOTSTATE->OUTPUT\_DISTANCE\_TO\_HOME, ADAPTIV->ADAPTIVE)
- Added GLOBAL\_INFO\_OFPL\_VERSION keyword (= 0.1 at the moment)
- Added importing and exporting of INSERT Tool types

### LS-Dyna

- Improved export so that jobs can now be run, one job per Step
- Added ability to give formatting information in LS-Dyna keywords
- Added Import and Export buttons to the LS-Dyna template dialog
- Added templates for Hot Stamping (<installdir>/Settings/Process/LS-Dyna-HotStamping - can be imported using the "Import" button in the Solver Control dialog)

## ***Process***

- Added 'Type' parameters Normal and Insert to Die, Punch and Binder.
- Added a Multibead item type which is a container for multiple Drawbeads with automated creation of Drawbeads when importing a geometry file. Drawbeads from imported simulation control files can be automatically combined into a Multibead (Preferences -> File -> Merging of Drawbeads on Import)

## ***Mesh***

- The selector status in the Modify tab is now per command, so when switching between two commands, the selector Method and Collect status is now remembered

## ***Post***

- Added a "Auto Distribute" action to Post multi view button
- Modified comparison to use a list Items instead of Processes
- Enabled projection for both sides in Transform Dialog for auto transform
- Added a legend to the FLC Dialog, with buttons for deleting, renaming, changing color, importing and creating a Keeler curve
- Unloaded increments (when file is opened with Read on Demand) are now shown with a different colour in the Slider.
- Increased tolerance in Boundary Trajectory Tool to avoid finding non-boundaries in Autoform rezoning cases.
- Added Range Mode combobox and User Defined range text fields below the Scale combobox in the Post Data dock widget
- Added easy access to "Max Search Distance" setting to "Items for comparison" in Post Data dock widget
- User can select multiple variables in the History Plots
- Removed "Read in All" option for variables when reading results
- Can export multiple Cross Section plots to a single XY file (missing values are linearly interpolated)

# OpenForm 1.8.2 (2012-07-23)

## Bug Fixes

### *General*

- Stopped "PARAMETER\_EXPRESSION" warning from being printed to the terminal when importing LS-Dyna input decks

### *Process*

- Fixed crash when editing force column of final row in the Drawbead force table dialog
- Fixed crash when selecting an Item in the Process Tree and then closing the session

### *Mesh*

- Fixed meshing Tools with "Arc Dependent" mesher when Face is in shape of half a circle

### *Post*

- Fixed reading the LS-Dyna input deck if reading results from current directory
- Fixed random crashes while showing certain variables if simulation hadn't been played through
- Fixed crash when reading LS-Dyna results if some nodes are in multiple parts and rezoned meshes exist
- Fixed OpenGL when using indirect rendering i.e. displaying on different machine to where OpenForm is running

## Improvements

### *General*

- Added a full UserSettings.conf file in the <installdir>/Settings directory

### *OFPL*

- User data (as found in ProjectData.conf file) now have \_USER\_ prefix (GLOBAL\_INFO\_USER\_\*)
- Copy Material and FLD files into <filename>.ofpl\_geo/Materials directory

### *Process*

- Added settings for the Material & FLD selection directories when using OFPL

# OpenForm 1.8.1 (2012-06-25)

## Bug Fixes

### *General*

- Directory is remembered in Run Simulation dialog if it is modified via the text field
- Can read files with the characters äöüß in the name on Windows

### *OFPL*

- Fixed never ending loop reading certain OFPL files
- For OFPL drawbeads, if only in a single step use step parameters for the force

### *Springback*

- "Check FLC" wasn't being written to sbc file correctly
- Fixed saving of changes when writing to a GDB and reading it again

### *Process*

- Guidepins are recognised again when reading GDBs written by version older than v1.8.0
- Material Dialog
  - ◆ FLD Location is read and shown correctly for LS-Dyna materials
  - ◆ Material selector no longer shown if file line edit loses focus
  - ◆ Characters ?? displayed correctly under Windows

### *Mesh*

- Fixed random crashes when selecting, adding mesh or modifying mesh

### *Post*

- Min/Max triangles on Scale are now correct if User Defined range has Min > Max
- Fixed crash when closing session if "Project Drawbeads and Trims" dialog is open

## Improvements

### *General*

- User can decide whether Input and/or Results are to be saved in the GDB

### *Springback*

- Only Indeed ASCII results format is allowed when running job

### *Process*

- Added Symmetry to Feasibility templates
- Material Dialog
  - ◆ Changed FLD location for LS-Dyna materials to be editable
  - ◆ Added a filter for \*.fld files when selecting the FLD file
  - ◆ Material Selector not shown for LSDyna materials if only one material present in file

- ◆ Warn user if no usable materials found in LSDyna material file

# OpenForm 1.8.0 (2012-05-30)

## Bug Fixes

### *General*

- Fixed setting of foreground and background color for Cross Section dialog - upon reopening of the dialog, the background was always white

### *Autoform Conversion*

- Fixed interpretation of TippingMatrix when it contains a displacement vector

### *Indeed*

- Do not allow a vector of zero length for RIGID BODY MOTION/TRANSLATE\_ROTATE

### *Process*

- ProjectData.conf was not being read from global installation directory or local directory
- Fixed crash when clicking on Drawbead Table parameter after deleting the Drawbead's Elements
- Fixed renaming of dropped Items when "Renaming of Items when dropping" was "Ask for new name", and "Item Default Prefix/Suffix" wasn't empty
- Fixed reading of user templates if "Item Default Prefix/Suffix" wasn't empty
- Fixed occasional crash under Windows after dropping a Process template

### *Mesh*

- Fixed meshing of Blank Rectangle using "Blank (non flat)" mesher
- Fixed refining of Elements if not in XY plane
- Fixed offset direction for Modify command "Element/Offset" - positive offset value now means an offset in direction of element normal

### *Post*

- [2012041958000041] Fixed reading of Fringe Scales per Variables setting when using old (< v1.7) settings
- Fixed Element visibility when using "On Demand" increment loading - CrossSection lines were disappearing
- Fixed accuracy when finding a point on a rezoned Quad - Incremental Displacement vector variable wasn't being calculated properly for rezoned Quad meshes
- Fixed "Fit To Window", which zoomed out to far under certain circumstances (View was "Z +0" and particular Items were shown)
- Fixed exporting to Pamcrash - no file was begin written
- Fixed recording of video when switching between a single view and multiple views
- Fixed recording of video when multiple views exist
- Fixed disabling of Simulation XY Plot dialog check boxes if curve doesn't exist in Process
- Fixed exporting to Iges and Indeed t51 with "Only Visible" turned on
- Fixed drawing of vector variables when some Elements are hidden
- Fixed setting the layer in the Transform Dialog - it was being ignored
- Fixed creating curves when a Node was one of the selected points
- Fixed Formability interpolation when showing fringe on Node



# Improvements

## General

- Can start a new simulation with the same Process as a currently running simulation (in Other button menu: "New Job with same Process")
- "Draw Drawbeads and Trims on top" is now available in all views
- Split Guidepin into single Guidepin and multiple Guidepins Items
- Synchronised options in Export dialog, e.g. changing "Only Visible" for one format changes it for all
- Added new environment variables for Run Menu commands - GNS\_LocalSimulationStatus and GNS\_RemoteSimulationStatus

## OFPL

- Rolling direction is now an angle
- Guidepins are recognised correctly as single Guidepins
- Added variable Drawbead force

## LS-Dyna

- Modified all keywords to have same structure - {<2 char identifier><4 char modifier>} e.g. {STTIME} - Step end time, {TOPTID} - Tool part id
- The number of times a template is exported to the keyword file depending on the keywords contained in the template, e.g. a template containing {STTIMD} and {TOPTID} will be exported for every Tool in every Step
- Added keyword {PRTIMD} (Process duration)
- Added keyword {VEID+?} (\*DEFINE\_VECTOR id)

## Process,Mesh

- Improved speed of showing and hiding Element normals

## Process

- Added OneStep Templates (under "Feasibility" item in the template combobox)

## Mesh

- Finished Piece no longer uses Blank meshing parameters or element type descriptions
- Added reading of Pamcrash mesh files

## Post

- [2012033058000094] Can import Iges under "Import External Mesh..."
- Added a menu to the Grid button for quick access to grid orientation and color
- Calculate local Principal Stresses for LS-Dyna
- Added saving of Post data
- Improved speed of initial draw of large items and redraw after hiding elements
- Reduced memory usage for LS-Dyna simulations when all Items are recognised as Blanks (if input file cannot be found)
- Can rename and delete Curves in FLC dialog (right click on menu item)
- Added reading of newer format for Autogrid FLC files in FLC dialog
- Added reading of LS-Dyna .fld files in FLC dialog

- Added a setting for the max distance between mapped points when using Comparison variables (Settings/Fringe/Mode and Range/Max distance between meshes for Comparison Variables)
- Made "Risk Of Cracks" in Formability have precedence over "Severe Thinning"
- Transform Dialog
  - ◆ Added option to auto transform to only consider Elements in the Destination if they can be projected onto the Source
  - ◆ Added "Insert Extra Points" option to auto transform for better matches
  - ◆ Added ability for auto transform to be run iteratively (till min error reached, error goes up or max num iterations reached)
  - ◆ Transforming via mouse is always available
  - ◆ Save and restore source/destination when opening dialog

# OpenForm 1.7.0 (2012-04-04)

## Bug Fixes

### *General*

- [2012032158000084] Fixed rendering when using OpenForm over RDP
- Fixed displaying of epsilon "1" and "2" on some machines
- "Run Local Simulation" and "Run Remote Simulation" actions are marked as checked

### *Springback*

- Send an error if finished piece file could not be written
- Send an error under Windows if file paths will be greater than PATH\_MAX

### *Autoform Conversion*

- Fixed conversion of Operation Tipping Matrix into Blank Translation & Rotation for some matrices
- Fixed damping in Steps that came after pure unloading & positioning Steps

### *Process*

- [2012022910000106] Fixed handling of Material Library path change in Material Selector - Ok can now be pressed
- Simulation name & directory in Run Simulation dialogs are updated when copying an existing Process

### *Mesh*

- [2012030810000117] Some open Curves are no longer incorrectly imported as closed Curves
- [2012030810000126] Fixed end points of Curves not being hidden with Curves
- Fixed remeshing of Blanks for certain examples - bad elements were being created
- Fixed crashes when reading a Nastran file with included files

### *Post*

- [2012031458000043] Fixed getting FLC data from an Autoform material file when it contains tabs
- Fixed importing Indeed hexa20 elements from ASCII results when the elements have large numbers of integration points
- Fixed crash when selecting a PAM Mapping file in the Results dialog while Increments was on "Read in User Selected"
- Fixed the import of saved transformation matrix files in the Transform Dialog under Windows
- Matrix in Transform Dialog/File is always the current transformation matrix of the Process
- Fixed crash when attempting to read GOM files with a bad configuration file
- Fixed GOM configuration file for comma decimal separator and for comments in file
- Fixed the Principal Strain from Strain11/22/12 equations
- Fixed Element lighting in Shaded mode for Elements on a sharp angled edge
- Fixed exporting to Indeed t51 & t52 files - etyps were wrong

## Improvements

## **General**

- Updated to Indeed v9.2.2
- Users can temporarily modify globally defined Indeed Executables/Scripts - changes are not persistent
- Set menu text color to black - the default color under Ubuntu made the menus unreadable
- Split "Export..." into "Write Simulation..." and "Export Mesh..." to make it clear what the user is doing
- Added a basic sessionfile capability (-r <record sessionfile>, -s <run sessionfile>, "Run Session File...")
- Added ability to modify Item default colors (Settings/Colors/Other Colors/Items)
- Added "--projectdata" command line option to define the ProjectData.conf to be used
- Added "-h" and "--help" command line options to show all possible command line options
- Changed "-post" and "-mesh" command line options to "-p" or "--post" and "-m" or "--mesh" respectively
- Modified Snapshot Dialog to be able to take snapshots of more windows - the window can be set in the dialog

## **OFPL**

- \*CONSTRAINED\_ADAPTIVITY keyword is used for Blank Quad meshes

## **Springback**

- Shortened Finished Piece filename to <name>\_fp

## **Autoform Conversion**

- Added Blank thickness and yield stress to the available parameters in the Drawbead force equation
- LS-Dyna or OFPL will be in the Solver Control after importing Autoform, if they are the default Solver
- Pilot Group Elements are the same after exporting to Indeed and re-importing
- Refined Quads on Blank boundaries for LS-Dyna and OFPL are now quads

## **Process, Mesh, Post**

- Added option to export Indeed t51 & t52 - only export Blanks or Tools

## **Process**

- Added Step Id to Step title bar in Process View
- Added Indeed user defined materials in Material Selector
- Display more material properties in the Material Selector
- Values in Step Solver Control have their default based on the Configuration table; changing a value in the Process or the Operation will change all child Steps
- Improved image in Drawbead Generator - image changes with the size, and the values can be input directly in the image
- Reduced memory usage and improved speed when exporting large Indeed simulations
- Added OFPL Solver, taking over from LS-Dyna Solver - LS-Dyna has now been extended to use templates and write out LS-Dyna files (see <INSTALLDIR>/Settings/Process/LS-Dyna/ directory for templates)
- New Items can be given a default prefix and suffix (Settings/File/Other/Item Default Prefix|Suffix)
- Made Step 'Time' parameter available for Gravity Steps

## **Mesh**

- Added new meshers for Blank and Tool
- Refining the boundary of Quad meshes creates Quads, not Trias
- Improved Remesh for Blanks that have sharp corners

## **Post**

- Can display the Grid in XY, XZ and YZ planes
- Improved speed of importing further LS-Dyna variables, after the initial import
- Added more variables when importing LS-Dyna - Reference Strain, Global Strains, Yield Criterion and Stresses
- Updated the LS-Dyna plugin to that from A4 v1.4.5
- LS-Dyna Local Principal Strain variables are created from the Global Strain variables - OpenForm now shows the same results as LS-PrePost for the FLC dialog
- Added an option to load only single layers of variables (Preferences/File/Post - Load All Layers), making the loading of further LS-Dyna variables quicker. This is similar to the A4 method of loading variables.
- Can display Hexa20 and Wedge15 elements
- Calculate Principal Stresses from Stress11/22/12 for PAM Mapping files
- Can export to PAM Mapping files
- Last selected option in Results Dialog for increment and variable lists is now remembered
- Only Visible option is honored when exporting to Indeed t52 & t53 files
- Added "Read on Demand" and "Read None" for the increments in the Results Dialog
- Added XY Plane option to Transform Dialog
- Changed Variable Buttons to not be disabled when no Variable is selected - only Variables that aren't in the Process are disabled

# OpenForm 1.6.1 (2012-02-10)

## Bug Fixes

### *Autoform Conversion*

- Fixed coupling of Binders to the Die

### *OFPL*

- Replace spaces with underscores in Item names when exporting

### *Springback*

- Enabled buttons correctly in Finished Piece

### *Process*

- Fixed crash when applying changes to any default Solver Parameters (Preferences->Solver->Indeed|LS-Dyna->Configure)
- Specific Weight is now initialized correctly

### *Mesh*

- Fixed Element normals for some Tools when exporting to an Indeed t52 file
- Fixed crash or possible lock up when meshing certain Blanks from large Faces or Curves, and Refine Edges was turned on

### *Post*

- Fixed selection of Elements by id for an LS-Dyna rezoned simulation

## Improvements

### *Autoform Conversion*

- Blank Element type is based on the Default Solver

### *OFPL*

- Added Finished Part Coordinate to the LS-Dyna Solver Parameters

# OpenForm 1.6.0 (2012-01-23)

## Bug Fixes

### General

- GDBs with non-ASCII characters are now read correctly, regardless of the machine on which they were saved (Note: only applies to GDBs saved with this version onwards)
- Fixed updating progress bar labels in Run Simulation when Step name changes
- Fixed exporting Nastran files under Windows - scientific format was using 3 digits for exponent
- Reduced start up time on some Linux machines with Qt installed, by removing influence of `~/config/Trolltech.conf`
- Fixed slow start on Windows when program is stored on a Samba share

### Autoform Conversion

- [201112161000042] Fixed intermittent incorrect offsetting of Tools
- [2012011310000129] Fixed positioning of safety region towards thinner tailored Blank side
- Fixed ignoring of NonActive spring supported tools
- Send a warning when reading TimeVariable force controlled tools

### Springback

- [2011121310000057] Fixed setting for Indeed Results Format

### Process

- Fixed updating of FLC plot view in Material Dialog when changing materials
- Fixed importing of Indeed when Items have an underscore at end of name
- Fixed Indeed material mbl files when exporting Indeed under Windows - extra blank lines were printed to the file
- Order of Tools in VELOCITY/LOADS block is now kept if an Indeed simulation is imported and exported

### Mesh

- [2011121310000101] Fixed meshing of some bad faces that caused poor quality meshes
- Fixed crash when meshing from CAD curves
- Fixed Translate Mesh "Reset Translation" - now only resets translations made in Translate Mesh

### Post

- Fixed crash when reading PAM Mapping files with variables containing multiple values (e.g. STRS, STRN)
- Fixed crash when pressing "Unpin all Increments" after having deleted a Process
- Fixed crash when using Save View under Windows
- Variable Drawbead info moves with the Drawbead
- Fixed reading LS-Dyna, PAM Mapping and Autoform results from same directory
- Fixed finding the LS-Dyna binary curve file if the d3plot file had a prefix
- Don't draw a reference of an Item that isn't active in the View
- Show Boundary Trajectory
  - ◆ Increased tolerance distance for selecting a boundary
  - ◆ Fixed boundary creation for rezoned Quads

- Show correct position of Tools, if they were moved in a Step in which they weren't active

## Improvements

### *General*

- Added a Visible Info tool
- Added remaining time to the progress bars in Run Local Indeed Simulation dialog
- Added an option to inform user when a local simulation finishes (Preferences: Solver/General/Notify about a finished simulation)
- All shortcuts now honor the "Lock Control" button (e.g. Ctrl+Shift+F1 becomes Shift+F1 and Shift+F1 becomes Ctrl+Shift+F1)
- Print Distance Along Normal Tool message to Message Dialog
- Added "Other Options" to all Indeed executables/scripts (Springback Script Location is now the actual location of the executable/script - all other options, such as the perl script, must be placed in the "Other Options" field)
- Improved File Dialog performance under Windows when viewing a network directory
- Improved printing of Distance/Radius/Angle Tools messages to Message Dialog
- Updated to Indeed v9.2.1
- Indeed license server is defaulted to the OpenForm license server

### *Springback*

- Added material check to the Process checks
- Improved speed for very large examples

### *OFPL*

- Removed GLOBAL\_INFO\_CARPROJECT, \_PARTNAME, \_NUMBERMETHOD, \_NUMBERINDEX, \_SIMULATIONVERSION, as these have been replaced with Project Data parameters in the Process Editor

### *Process, Mesh*

- Blank and Tool default meshing settings for import and creation can be defined in the Preferences Dialog (File/Other/Mesh: Change Default Mesh Settings)

### *Process*

- [2010110310000016] Unused Tools are exported to Indeed, and can be shown in Post
- Added Rezoning Zones for Indeed simulations
- Improved error description when using the Drawbead Force Generator
- Finished Pieces are exported to Indeed as a .t50 file which can be imported from the .erg directory (when renamed "input.bin")
- Added user definable Project Data parameters to the Process Editor (see <installdir>/Settings/Process/ProjectData.conf)
- Gravity Steps have Rezoning turned on by default for Indeed

### *Mesh*

- Added export to Iges
- Added an Item context menu to the Items DockWidget



## Post

- [201107131000049] Can configure the Formability fringe scales
- User can give a configuration line for importing GOM files (File/Post/GOM Import: Point Configuration)
- 3rd Principal Strain from GOM files is used to calculate Thickness and Thickness Change variables, if a thickness is found
- Improved handling of Project Drawbeads and Trims dialog
- Nodes hidden behind other Elements are no longer found when selecting
- Can import STRS, STRN and ORTHO from PAM Mapping files
- Can display all UTF8 text (including Chinese characters) in OpenGL window
- Can import Inner/Mid/Outer/Max variable layers from LS-Dyna
- Can recognise Mid and Top layers in Autogrid files
- Can show LS-Dyna temperature variable on Tools
- Show Boundary Trajectory
  - ◆ Lines are coloured by distance (3D or 2D), according to a selectable fringe scale
  - ◆ Can select points to show distance
  - ◆ Massively improved drawing speed
- Transform Dialog
  - ◆ [201110271000071] Added undo ability
  - ◆ [201110271000089] Added ability to transform process with mouse (hold shift)
  - ◆ Added importing and exporting of matrices to/from file
  - ◆ Made transform button context sensitive (some options apply immediately)
  - ◆ Replaced transform button with +/- buttons for user matrix
  - ◆ Update points for 3 point selection upon transform only if already set

# OpenForm 1.5.2 (2011-11-11)

## Bug Fixes

### *Springback*

- Fixed checking for FLC in RunSpringback Dialog
- Fixed updating of RunSpringback Dialog when Undo is pressed
- Fixed selection issue when Pick Point is active and "Select Lines for Compensation" is opened
- Made lack of a Forming Step a non-fatal error

### *OFPL*

- Use a semi-colon instead of a comma to separate Tools in POSITIONING keyword
- Export Trims to Iges files instead of LS-Dyna keyword files

### *Autoform Conversion*

- [2010111710000099] Fixed crash when importing Autoform with "Use Indeed Material if available" and an Indeed material was found
- [2011102510000083] Fixed creation of Tailored Blank when split into more than two pieces

### *Process*

- [2011102510000056] Fixed moving of Drawbeads with Tools in Animation preview
- [2011102610000036] Fixed updating the thickness of a Blank when using From Mesh
- Fixed importing and exporting of Indeed parameter REZFLG
- Fixed crash reading some Indeed dat files when they contain Boundary conditions
- Fixed Blank name when importing some Autoform .inp files

### *Mesh*

- Fixed coloring of labels created using Info

### *Post*

- [2011101810000159] Fixed crash under KDE when attempting to export Curves
- Fixed calculation of min/max of variable shown on Elements when some Elements are hidden
- Don't transform "User" points in Transform Dialog if they haven't been set
- Fixed crash in X-Section Plot Dialog when switching between Post and other views
- Fixed crash in X-Section Plot Dialog when multiple Processes exist

## Improvements

# OpenForm 1.5.1 (2011-10-28)

## Bug Fixes

### *Process*

- Write Indeed solver parameter REZFLG (Rezone in Advance) as parameter 7

### *Springback*

- Fixed adding of scrollbars for lengthy modules in Springback
- Fixed crash in creation of springback

### *Post*

- Fixed crash when projecting drawbeads/trims onto tools
- [2011101810000141] Fixed crash when creating post curves

## Improvements

# OpenForm 1.5.0 (2011-10-13)

## Bug Fixes

### *General*

- License is freed if program crashes
- User can no longer start another command while progress dialog is open

### *Process*

- Element normals are shown with Boundary style
- Fixed transparency
- Fixed possible crash when editing a vector with the Define Vector dialog open, and a different item was selected
- Fixed recognition of materials in the Material Library when importing an Indeed job
- Fixed recognition of Indeed materials in the Material Library when loading a GDB
- Fixed recognising Step and Operation names in Create Restart dialog when the dat file was a restart Process
- When exporting Indeed force tools, force is total force, not force per unit of time
- Fixed an error that stopped the dropping of new Tools onto a restart Process that had Trims or Drawbeads

### *Mesh*

- Element normals are shown with Boundary style
- Fixed transparency
- Fixed importing certain Nastran decks on certain machines
- Fixed crash when reading of Nastran failed

### *Post*

- Reference of non-active Items no longer drawn
- Variable Min/Max is linked between views when "Link Variables" is true
- Export to Indeed t51 honors the "Only Visible" flag
- Show/Hide from right click menu works when used from within Transform Dialog
- Cross Section Lines are updated if Transform Dialog is used
- Distance to Reference values are now the distance TO the reference, not FROM
- Fixed Fit to Window in Cross Section dialog when reference Items are being shown
- Reduced the number of incorrect nodes mapped to each other in Comparison
- Stop animation while reading, which caused issues in multiple places

## Improvements

### *General*

- Upgraded Linux version to glibc v2.5, gcc v4.1
- Added a "Shiny" slider to the User Defined lighting
- Dynamic rotation center works for rotating around Z (rotate using right mouse button)
- Can read gzipped Autoform, Autogrid, GOM, STL and Nastran files
- Changed the Indeed version numbers 9.0.0 and 9.1.0 to 9.0.x and 9.1.x respectively
- Improved speed of drawing

## **Springback**

- Allow selection of compensation lines via the mouse
- Run similar checks to Run Local/Remote Simulation when pressing Start
- Scripts are now set in the Preferences (Preferences/Solver/Indeed/Indeed Springback Scripts)
- Made run dialog similar to Run Local/Remote Simulation
- Various Process Check Items made configurable
- Display more information about Process Checks in tooltip
- Move next/apply buttons for main tasks to bottom of Springback settings dock

## **OFPL**

- Spring Supported Tools now imported and exported
- Time Control taken into account when using TOOLy\_LOAD\_WAYCAD
- Added import and export of symmetry
- Added basic initial movement handling
- TOOLy\_LOAD\_FORCE export format changed in line with Dr. Fleischer's wishes
- TOOLy\_SURFACEDESCRIPTION now imported and exported
- Blanks exported to <file>.ofpl\_geo/Blank directory
- Removed GLOBAL\_DATA\_PROJECT\_{PATH,NAME\_PROJECTFILE,PROJECT} keywords
- Added comment lines to exported file

## **Process**

- Added Drawbead Force Generator when inputting Drawbead force
- Added the OpenForm version number to the exported Indeed dat file

## **Mesh**

- Added a Reset to defaults button to Check Mesh settings
- Added Boundary Nodes selection method

## **Post**

- [2010110210000107] Show prescribed binder force in tool force plot
- [2011052610000117] Added scaling of displacements (Tools/Scale Displacements)
- [2011082410000071] Can read gzipped Indeed results
- Added a Wrinkling variable
- Can use Blank color for points in FL Diagrams
- Scanned list of variables in Open dialog only show those that exist in the file
- Can handle deleted elements in LS-Dyna results
- Added solver name to Process Information dialog
- Added Distance to Other Process variables when comparison is switch on
- Added Distance to Other Process variables in the Transform Dialog
- Transform Dialog offers a "3 Points" method of transformation
- Cross Section Dialog shows Transform Dialog view if it is open
- Replaced Ok/Cancel buttons in Transform Dialog with Close - changes are immediate
- Added status messages when transforming in Transform Dialog
- Can display variable values on initial state, so Distance to Reference and Distance to Other Process (if comparison is on) works for the initial state
- Added reading of GOM files
- Added reading of PAM mapping files
- Added Show Boundary Trajectory tool (EXPERIMENTAL!)
- Can create a Keeler FLC in FLC dialog

- Added a Show Comparison Point tool - used to show the point on the "other" process that is being compared. Note that this takes into consideration the thickness for 2D elements.
- Added Ctrl+Delete as a shortcut to stop the animation
- Reversed the Incremental Displacement vector arrows to show where the node has moved from

# OpenForm 1.4.3 (2011-09-06)

## Bug Fixes

### *General*

- Windows version can be run from a remote machine (same as v1.3)
- Fixed crash under Windows when starting certain Indeed jobs

### *Process*

- Fixed error that caused wrong Blank element types when exporting to Indeed

### *Mesh*

- Fixed Blank element types when using Auto Mesh Allocation
- Fixed picking an object behind an object already picked (made Cons Paste difficult)
- Fixed Auto Repair in Check Mesh for elements under the minimum length
- Fixed crash when meshing a Tool/Blank while in Boundary style

### *Post*

- Fixed crash in Transform Dialog when a Process had boundary conditions
- Stopped the writing of a debug file (src.ses) when using Transform Dialog
- Fixed drawing of points in FLC dialog if Auto Scale isn't used
- Fixed drawing of points in FLC dialog if some elements are hidden

## Improvements

### *General*

- Updated to Indeed v9.1.2

### *Post*

- Improved accuracy of Transform Dialog

# OpenForm 1.4.2 (2011-08-23)

## Bug Fixes

### *General*

- Fixed crash under Windows when using Cross Section Dialog
- Fixed a few translations
- Corrected the Run Menu environment variables when no Processes exist

### *Process, Mesh*

- Cross section lines didn't move under certain circumstances

### *Post*

- Fixed potential crash after cancelling the reading of Indeed results, and reloading
- Fixed crash when re-reading already imported results
- Fixed crash on certain 64bit Linux distributions when using the Transform Dialog
- Fixed "Angle to Reference Normal (deg)" variable when Node doesn't exist in reference

## Improvements



# OpenForm 1.4.1 (2011-08-12)

## Bug Fixes

### *General*

- Fixed adding new Indeed v9.1.1 executable to list of local executables

### *Process*

- Fixed crash when reading in certain older saved GDB files

### *Mesh*

- Fixed crash when pressing Delete key
- Fixed crash after pressing Cancel in Mesh Allocation dialog, then selecting another file
- Fixed crash when modifying Blanks while they have tying conditions

### *Post*

- Fixed bug that changed all quads to trias when reading Indeed results
- Fixed crash after pressing "Show possible variables" in Run Menu tab in preferences dialog
- Fixed crash that sometimes occurred while showing variables on Elements
- Fixed reading Autogrid from command line or recent documents menu - some scalar variables weren't being read

# OpenForm 1.4.0 (2011-08-02)

## Bug Fixes

### General

- [2011070810000013] Fixed reading a saved GDB - exported jobs weren't the same
- Fixed drawing of coordinate system (lines/text were always drawn below axis guides)
- Fixed crash when attempting to move labels
- Changing OpenGL font works immediately

### Springback

- Fixed saving a GDB before a master side was selected

### Process

- Fixed reading OFPL files when absolute paths are given in file
- Fixed reading mesh from OFPL files
- Use relative paths in exported OFPL files

### Post

- Fixed Process Information number of Nodes/Elements for AutoGrid results
- Fixed reading the results of a remote Indeed job, where an incorrect error was being sent
- Fixed position of circle marker in XY Plots when Increment is the X-Axis
- Export to Indeed t52 honors the "Only Visible" flag (t51 still doesn't)
- Fixed crash when two FLC dialogs were open with different simulations and we selected a node/element in one of the main views
- Fixed some crashes when swapping active views and moving between multi-view and single view
- Fixed second/fourth window size under Windows, when changing number of visible views

## Improvements

### General

- Using MSVC for the Windows versions
- Maximized window is now remembered
- Added a setting to set precision for labels (Display/View/General/Display Text Precision)
- Rearranged display page in preferences dialog, adding a View tab
- Added "User Defined" and "Gloss" (Post only) lighting options
- Removed Scout
- Updated OpenForm logo and made About dialog similar to Animator4
- Recognise ".projekt" files as OFPL files
- Recognise ".set" files as LS-Dyna files

### Process

- Added a progress bar when importing and exporting OFPL
- Blank Symmetry can be in Z direction
- Can press Escape to deselect objects
- Added Indeed solver parameter REZFLG (Rezone in Advance)

## **Mesh**

- Added option to Geometry Delete command - "Delete empty Cons"

## **Post**

- When variables are linked across Views, the Fringe Scale is also linked
- Changed the variables Dock Widget: using check boxes on tabs instead of buttons to turn Scalar and Vector variables on and off
- Added a "Read in Recommended" variables option to the Open Results dialog
- Added File/Post/Variable Loading/Recommended Variables option - only recommended variables will be read when reading from the command line or the Recent Files menu; all other variables will be loaded upon demand
- Can use mouse to select an Item in the Item List (press Escape to deselect)
- Added "Show Selected Border" option to View menu
- Process name is read from file when reading AutoGrid results
- Improved speed of initial loop, by using multiple threads for calculations
- Added Tool/Transform Process
- Added ability to compare results of two simulations
- Added ability to change color for Reference Increments (View/Reference Increment/Color)
- User can set the color of the invalid variable values, which are also ignore for min/max calculations (Colors/Other Colors/Post/Invalid Variable Value)

# OpenForm 1.3.1 (2011-06-22)

## Bug Fixes

### *General*

- Fixed showing of Indeed settings in Preferences dialog from Run Indeed & Springback dialogs

### *Process*

- Fixed date in OFPL exported file
- Fixed reading of OFPL files that had been exported under Windows
- Added a Cancel button to the Autoform settings dialog when reading using the Open dialog
- Fixed not showing of Autoform Conversion settings dialog

### *Mesh*

- Fixed meshing of Blank after deleting Faces, then rotating
- Fixed showing of Autoform Conversion settings dialog

### *Post*

- [2011042710000108] Fixed reading all increments of certain LS-Dyna results
- Fixed reading of certain LS-Dyna results where reading immediately failed
- Reduced virtual memory usage when reading LS-Dyna results (regression from v1.2.0)
- Use the correct Item names, if found, when reading LS-Dyna results
- Fixed projection of Drawbeads and Trims

## Improvements

### *Process*

- Added LS-Dyna as a solver (Preferences/Solver/General/Default Solver)
- Added option to set the Operation Name Increment (Preferences/File/Other/...)
- Export Springback support points to OFPL

### *Mesh*

- Added ability to mesh Blank using Quads when using LS-Dyna
- Added new selection method for Faces: Angle

# OpenForm 1.3.0 (2011-06-01)

## Bug Fixes

### General

- [2011042110000155] Convert a comma to a period when user types a real value into a text field
- Fixed Dynamic rotation center, and it now works with border and wireframe modes
- When running a remote Indeed simulation, don't check for cpr file immediately, as it may still exist from a previous simulation
- Fixed showing of "User Defined" Step type in Indeed default solver configuration table
- Fixed pressing 'Move Labels' then 'Delete Labels' while move was still active

### Springback

- Exported file names always have the correct path separators for the platform
- Fixed the "move" data in the ifs file for Items created by splitting other Items
- Fixed style indicator for Dummy Item in Items widget
- Changed the word "Optimization" to "Compensation" in the GUI
- Improved speed of loading of very large Springback GDBs
- Allow for spaces in file names in the execute command
- Check that the given master side can be a master side, which, after user changes, may no longer be the case

### Process

- [2011040710000075] Can handle variable drawbeads where all values are zero
- Fixed handling of Process names ending with "\_00"
- Fixed updating of view in Process after adding mesh in Mesh and switching to Process
- Fixed the icon view of a single Item in a Step - the control wasn't being updated
- Don't allow a force tool to close if it was a force tool in a previous Step. This will be shown as a warning when exporting, and an error when animating the Process.
- Added a warning when exporting Indeed and the Blank could move up or down with the given Initial Movement for a Step
- Don't use non-existent path names for the materials when exporting to Indeed
- Fixed reading Indeed dat files with "-----" in the title
- Fixed positioning of converted tailored Blank elements (Shell<->Solid)
- Fixed crash when reading a GDB file after undoing a previous read
- Fixed recognising user Step types (as defined by ?/Settings/Step/<user step type>)

### Mesh

- Fixed crash in Check Mesh when checking solid meshes

### Post

- [2011052510000048] Fixed drawing of marker in plots where number of increments does not equal number of points
- Fixed displaying of model in Load/Save View dialog
- Fixed importing of certain Autoform external meshes, where Item was assumed to be a Drawbead
- When reading Indeed, an empty flcdat.asc file is no longer sent as a warning
- Fixed crash when scanning of older indeed results in open results dialog

# Improvements

## **General**

- Updated to Indeed version 9.1.0

## **Autoform Conversion**

- [2011011410000067] Handle Spring Supported tools

## **Springback**

- Renamed 'SpringOpt' tab to 'SpringComp'
- Check FLC checkbox is only enabled if available
- Added a weak check for a Trimming Step
- Update the command text on the fly as command is edited
- Added a Next button to each of the tasks
- Added "Measurement Reference" parameter
- Improved display of errors when checking mesh
- Restrict the Tool check to those in or before the Springback step
- Added TrimmingIsPresent parameter to .sbc file
- Significantly reduced the size of the .ifs and .sbc files
- Use relative paths for file references inside the .sbc file

## **Process**

- Added import and export of OFPL files (basic and experimental!) (license locked)
- Added Spring Supported tools
- Changed default Indeed parameters for Springback Steps - CIABK2 and RABKR
- Only export Indeed CONTACT block if we have active tools
- Don't display a negative zero number (-0) in Tool vectors
- Added Process Information dialog
- Changed "Dummy" to "Finished Piece" and added a thickness to the parameters
- Added option (Preferences/File/Other/Renaming of Items ...) to ask the user for name
- Improved importing and exporting of OFPL (including geometry - NOTE: LS-Dyna only!)
- A progress dialog is shown while loading a GDB, which the user can now cancel
- Added ability for Trims/Drawbeads to move with a Tool (Indeed v9.1.0 required)

## **Mesh**

- Added Process Information dialog
- Added a minimum length check to Check Mesh

## **Post**

- Improved Process Information dialog to display a lot more information
- Create Restart dialog can handle multiple Processes
- Can export solid & thick shell elements to Indeed t52 files (using top, middle or bottom of element)
- Added user defined variables (Tools/User Defined Variables)
- Improved speed of loading and drawing
- Improved speed of Distance to Reference variable calculations
- Reduced memory footprint
- Added Thickness Change variable when reading from Autogrid files

# OpenForm 1.2.0 (2011-03-29)

## Bug Fixes

### *Springback*

- Write correct item names to .ifs file (ie blanks written as underscores)
- Check Principal Strain is activated, not Principal Stress

### *Autoform Conversion*

- [2011030910000135], [2011030910000091] Fixed reading of very similar tipping matrices
- Fixed displaying the incorrect yield curve in the Material Viewer for certain element types

### *Process*

- Fixed Indeed materials defined using Windows UNC paths, after reading a GDB

### *Post*

- Fixed error in reading Autoform results - the values were assigned to the wrong node/element
- [part of 2011013110000196] Fixed missing Formability/FLC Distance variables when reading Autoform results
- Fixed error in reading Dyna results - drawbeads were seen as a tool or blank
- [2011030210000031] Hopefully fixed snapshot when windows cover screen
- When recording video, ignore frames that are exactly the same
- Fixed crash when importing badly formed Indeed result files

## Improvements

### *General*

- Updated to Indeed version 9.0.0
- [2010110210000072] Can show/hide individual elements/geometry
- [2010090610000061] Added ability to change all shortcuts (Preferences/Shortcuts)
- [2010110210000091] Added "All Files (\*)" filter to Export dialogs
- Moved Indeed export option "Language" to Preferences dialog
- Don't block program when starting spacemouse under Windows
- [2010110310000071] Cross section can update main view if "Hide Geometry" is selected -> see Preferences/General/View - Cross Section: Update Main View if "Hide Geometry"

### *Springback*

- Added extra process checks before creating Springback Optimizaton
- Added option to export lines for compensation
- Added Check FLC option to springback optimization
- Added Automatic target option, so finished piece no longer mandatory
- Added Indeed Version to springback optimization file
- Added writing of MoveVector to ifs file
- Added option to set number of cores for springback process
- Added Measure Toolbar
- Added writing of vector for MasterSide tools in control file
- Forced Indeed Analysis Type to Analysis when exporting springback

- Automatically add Springback control file as argument to command to execute

### ***Autoform Conversion***

- Added option to stop insertion of force tool closing step

### ***Process***

- Modified the Indeed "Solver Control/Solver" option - changed to PARDISO/PARISOL
- [2010110210000045], [2010110210000161] Added cross section functionality
- Changed Tool control option "Displacement" to "Velocity"

### ***Mesh***

- Can select using "Face Groups" i.e. layers from Iges files
- Only those elements that will be removed in Mesh/Remove Elements are highlighted
- Allow box selection in Modify/Element/Split
- [2010110210000045], [2010110210000161] Added cross section functionality

### ***Post***

- Improved the menus for imported FLCs in the FL dialog
- Added axis names to the FLC dialog
- Corrected showing Thickness variable for solid elements
- Improved rendering speed
- Can display multiple views with linked or separate slider/variables/transformations
- Can display multiple processes in a single view
- [2010110210000072] Added option to use only visible elements for variable min/max calculation (Preferences/Fringe/Range and Mode - Only use visible Elements/Nodes)
- Double clicking a fringe scale will show that scale in the Preferences dialog
- Combined "Export" and "Export Blank Perimeter" dialogs
- [2010110310000034] Can display multiple reference increments
- Enabled AVI video generation under Windows 64bit



# OpenForm 1.1.1 (2011-02-07)

## Bug Fixes

### *General*

- Windows 64bit version works under XP and Vista
- [2011011410000094] Removed the need to click twice when selecting a point with the SelectPoint dialog open

### *Autoform Conversion*

- Fixed trim direction when using a 3D curve
- Fixed Guidepins when same points appear in multiple ProcessSteps

### *Process*

- Fixed importing Indeed Gravity and Pressure loads in consecutive Steps
- Fixed initial movement for certain Steps, when loading a template or using Restart
- Fixed Name in Indeed simulation dialogs when Process name changes

### *Post*

- Fixed crash when reading Indeed & pressing reload/cancel repeatedly
- Fixed crash when selecting a point in Tool/Curves
- Fixed formability values in Preferences dialog, when user Formability scales exist
- [2011011410000085] Fixed background color of main view when using Snapshot with a transparent background
- Grid square size can now be larger than 100
- [2011013110000114] Fixed reading of certain LS-Dyna results - min/max was completely incorrect

## Improvements

### *General*

- Use the Label color for the Blank rolling direction arrow

### *Mesh*

- Use the Label color for the Rectangle corner labels

### *Post*

- [2011013110000114] Improved speed of LS-Dyna results reading

# OpenForm 1.1.0 (2010-12-13)

## Bug Fixes

### General

- Corrected finding the Indeed executable when starting program for first time

### Autoform Conversion

- Improved adjusting of normals in cases of bad elements

### Process

- [2010120610000091] Fixed gravity direction when reading in a GDB
- [2010112210000114] Fixed crash or lack of setname when exporting variable drawbeads to Indeed .t56 file
- [2010112310000032] Fixed recognising '+' sign when reading Indeed boundary conditions
- Fixed unpredictable crash when closing session
- Fixed exporting of Indeed symmetry conditions for Crisfield Mindlin shell

### Mesh

- Right click menu is shown if a Modify command is open, and nothing is selected

### Post

- Fixed recognising of Windows UNC paths as absolute paths when reading Indeed results
- Fixed Visualisation of "Nodes In Contact" variable
- Correctly recognise Blanks when reading LS-Dyna results
- Fixed cross section plane direction when in YZ view

## Improvements

### General

- Windows 64bit version available (NOTE: Video export is not available for this version!)
- [2010082710000111] Added window zoom (Ctrl+F6 - also in "Pick Rotation Center" toolbutton)
- Single "Pick Rotation Center" available with Ctrl+F5
- Zoom in/out available with Ctrl+F7 and Ctrl+F8
- [2010082710000201] Added Spacemouse support
- Automatically check for outside updated results when running a remote simulation
- [2010090610000122], [2010090610000131] Added Guidepins Item
- Added a "Custom Version" to the remote Indeed script arguments

### Autoform Conversion

- [2010111710000062] Can handle locked regions of variable drawbeads

### Process

- Can drop an Item onto the Process or Operation to have it added to the entire Process or Operation

## **Mesh**

- Can split bar elements in "Split" and "Refine"
- [2010082710000166] Added "Mirror" Element and Geometry commands
- [2010082710000175] Can define the direction used for the Undercut in Check Mesh

## **Post**

- [2010110210000171] Added the ability to have multiple formability scales
- Improved speed of rendering
- Can read Step duration and rest time from Indeed results (Indeed >= r261)
- Added GNS\_StepDuration and GNS\_StepTakenTime to recognised variables
- Massively reduced the memory requirements to read in rezoned LS-Dyna jobs
- Can read "Temperature" variable from LS-Dyna results
- Can recognise an LS-Dyna d3plot file if it has a prefix
- Improved error reporting when reading results, e.g. when file isn't found
- [2010111710000053] Check more often if "Stop" has been pressed when reading Indeed results
- Extended "Project Drawbeads and Trims" dialog
- [2010110310000025], [2010111710000071] Gave Item edges and mesh separate colors (Preferences/Colors/Other Colors/Display - Mesh/Edges), so edges can be seen in Wire and Shaded styles
- [2010110410000087] Left and Right arrows stop at initial state and end increment, while Up arrow goes to initial state

## **Springback**

- Extra parameters added for the workflow
- Split file contains the offset amount for the elements
- Can modify the Indeed solver parameters

# OpenForm 1.0.1 (2010-10-28)

## Bug Fixes

### *General*

- Fixed intermittent crashes when importing/exporting Indeed Processes
- Fixed error when reading a GDB with multiple blanks

## Improvements

# OpenForm 1.0.0 (2010-10-27)

## Bug Fixes

### *General*

- Vectors entered into the vector lineedit are accepted without pressing Enter
- Corrected drawing of end points of drawbeads, which were sometimes missing
- Starting and closing program is now quicker when many templates exist
- Corrected reading Indeed \*.t51, \*.t52, \*.t53 and Autoform \*.af files from command line
- Fixed import of Nastran files with CRODs
- Fixed import of Nastran files with no ENDDATA keyword
- Fixed bug in Run Menu that made commands appear twice

### *Autoform Conversion*

- Use default numerical parameters
- Corrected positioning of Guide Pins when point is directly on Blank outline
- Fixed splitting of Blanks when reading certain welds
- Fixed Guide Pins location in certain situations
- Fixed Element normal orientation for tailored blank transition region

### *Process*

- Existence of Material files is checked more than once per session
- Fixed adding of new Operations and Items to a restart Process
- [2010090110000113] Show underscores in Editor list
- Element normals are updated when the Tool direction is changed

### *Post*

- [2010090110000122] OpenGL text positioning is updated when font is changed
- Fixed reading of FLC data in post when running a simulation
- Fixed reading of multiple FLCs from the flcdat.asc file

## Improvements

### *General*

- Program name changed to OpenForm
- Can start and control a remote simulation using the GNS Systems script
- Changed Run Local Simulation shortcut to Ctrl+L (Remote Simulation is Ctrl+R)
- Updated included Indeed executable to 8.0.4\_dev256
- [2010082710000193] Added ability to delete single labels (View/Delete Labels)
- Improved About dialog
- [2010102010000012] Added ability to set size of Snapshot image

### *Autoform Conversion*

- Can use the Tool offset value as defined in the inp file
- Can read in PilotGroups

## **Process**

- [2010082710000157] Added ability to change Process name to GDB saved name (Preferences/File - When Saving: Update Process name to GDB name)
- Improved speed when changing color of many elements
- [2010090610000024] Reduced memory needed to export an Indeed project
- [2010090610000024] Improved error reporting when exporting an Indeed project
- Changed Indeed Process parameter "Number of Restart Files" to "Number of Cyclical Files"
- Added Indeed Process parameter "Step End Restarts"

## **Mesh**

- In Check Mesh, View is rotated to show failed element better

## **Post**

- Added "Only Active Items are Visible" to View menu
- Added video creation (View/Record Video)
- [2010082710000184] Can configure the information line (Preferences/Display/Post - Post Info Line)
- Add more options when generating colors for fringe
- Added step remaining time to the available variables (GNS\_StepRestTime)