

## Speedstack key product milestones

(Detailed change history on following pages)

- 2022**
- New Structure View feature - Drag the stack up image to the left or use the new Show / Hide Structure View button to view a graphical representation of all structures on the stack up
  - New Grid View feature - Grid View presents the current stack up in an editable data grid form to allow for easy editing of multiple materials from a single dialog
  - Online Library - AGC now added to the Supplier Filter option
  - Confidential Stamp Options added to the technical report
  - New Snap Parameters and Calculate Structure feature
- 2021**
- Material note enhancements. Core and Flex Core materials have now been expanded to support 15 notes fields. 5 x Upper Copper Notes, 5 x Dielectric Notes, 5 x Lower Copper Notes
  - New Drill Cap feature
  - New Layer Name property added to the electrical / copper layer element of a material of Foils, Cores, Flex Cores, RCCs and Shields
  - The number of Copper Finishing classes has increased from 4 to 20
  - The All Losses plot y-axis and data series labelling has been improved
  - New Apply Plating Colours toolbar option – automatically assign different colours to plated and un-plated copper layers
  - Support for Shield materials
  - FlexNet Publisher / FLEXIm v11.17.2.0 supported
- 2020**
- Online Library - improved workflow aiding more rapid download of library files
  - Online Library - new Filter by Frequency option
  - Technical report - now possible to select all pages, a page range or an individual page
  - The number of stack up columns available for drilling information has been increased from 6 to 11
  - New Back Drill type supported
  - 16 new drill properties including five user-definable notes fields
  - Selectable plating thicknesses added under Finishing Options
  - Enhanced Material Library and Virtual Material Stack Up Wizards with increased the layer count limit from 64 to 128
- 2019**
- DRC Resin Check / Excess Resin DRC enhanced to offer better support for sequential build stack ups
  - Convert To Core functions enhanced
  - Technical report includes multiple new options to customise printed output

Loss tangent fields added to library materials  
Set Dielectric Constant and Loss tangent either manually or automatic from library  
Virtual material mode supports loss tangent in laminates and soldermask  
Import export files updated for 3rd party interfaces to CAD / CAM  
Causal modeling extended to copper losses  
Four Additional Drill – Via fill types

- 2018** Import and export for industry-standard IPC-2581 Rev B files  
Eight new coplanar structures added, requested specifically for flex and rigid-flex designs  
Online Library - new On-Premise Mode  
New Cannonball-Huray method added to Surface Roughness Compensation options  
Full insertion loss data per structure including roughness modeling methodology  
Insertion loss graphs and data in reports  
Rich copy / paste insertion loss data to / from Si9000e  
Export insertion loss projects to Si9000e
- 2017** Online Library – download the latest material libraries  
Net Class functionality – enhances functionality when used in conjunction with CAD constraints managers  
Enhanced alignment of flex materials – through addition of material attributes – eases visualisation of bikini build flex construction  
Proportional view – to investigate appeal of a “virtual cross section” view
- 2016** Edit and change copper layer types without losing impedance structures, new structure validation options, added barcode output to bill of materials.
- 2015** Exports to Cadence Allegro, Mentor Xpedition, Zuken CR-8000 and Ucamco Integr8tor. Copy groups of impedance structures to new Si8000m and Si9000e projects option.
- 2014** Export to IPC2581 rev B, Support for Stacked laser vias, enhanced copy / paste material library properties, and all new material library wizard.

For detailed changes – please read on:

## Version 22.11.22

### *Fixed*

1. Stack up graphic draw problem if Display Field 5 is set to Isolation Distance AND the bottom material of the stack is a solder mask - 001-00-000906
2. Crash where the bottom-most layer is deleted and then the next bottom-most layer is right-clicked

## Version 22.11.01

### *Enhancements / changes / additions*

1. Structure View Enhancements - 001-00-000905
  - a. Improved vertical panning now available when a stack up design fills the editor window at View | Default View
  - b. When zooming in and out, structure view will now remain visible rather than snapping back to the editor view when the maximum zoom level is reached
  - c. Improved handling of stack ups with multiple structures on the same layer with the same target impedance and structure type
  - d. Column header spacing is now corrected for stack ups where no solder mask is present
  - e. If Display Field 5 is set to Layer Name / Data Filename, long string fields are truncated to prevent overspill into the Structure View graphic
2. Import IPC-2581 Rev B. Improved support for stack up files that contain controlled impedance structures assigned to Mixed layers - 001-00-000901, 001-00-000904
3. Technical Report. The Summed Isolation Distance problem when using certain material combinations is now resolved - 438-04-000259

## Version 22.09.01

### *Enhancements / changes / additions*

1. Structure View. Drag the stack up image to the left or use the new Show / Hide Structure View button to view a graphical representation of all structures on the stack up - 479-02-000111
  - a. The structure ordering is by Target Impedance from low to high and then by Structure Type
  - b. The view is interactive, clicking on the impedance structure trace(s) will switch to that structure on the Controlled Impedance tab. Browsing through structures on the Controlled Impedance tab will highlight the appropriate structure in this view
  - c. This new view may be exported using the new File | Export | Controlled Impedance Data option
2. Online Library. Oak-Mitsui now added to the Supplier Filter option
3. The View | Zoom Extents menu option short cut has now been assigned to Ctrl+8 - 001-00-000895

## Version 22.07.20

### *Enhancements / changes / additions*

1. Grid View. Accessible from a new toolbar option, Grid View presents the current stack up in an editable data grid form to allow for easy editing of multiple materials from a single dialog.  
The Grid View can be edited directly or the stack up can be copy & pasted to Excel, allowing data to be merged with other spreadsheet-based stack up information before being pasted back to Grid View.
2. Stack Up Notes. User interface improved to inform users where notes should be entered that are subsequently printed on the technical report - 001-00-000897

3. The Tools | Options | Structure Defaults | Separation Region Dielectric (REr) now supports double data types. Previously, it only supported integers - 438-04-000252

## Version 22.05.06

### *Enhancements / changes / additions*

1. Online Library. AGC now added to the Supplier Filter option
2. Improvements to the way the impedance structure substrate height (H parameter values) are calculated for Embedded Microstrip structures when the outer electrical layer is designated as Mixed. 001-00-000893, 479-02-000109
3. Confidential Stamp Options added to the technical report. The location and text can be configured using the new Confidential option from the technical report Options menu. 438-04-000182

### *Fixed*

1. If a stack up was created with just two ident materials with no other different material types, an exception would occur. This is now resolved. 438-04-000246

## Version 22.01.01

### *Enhancements / changes / additions*

1. New Snap Parameters and Calculate Structure feature added to the Controlled Impedance tab toolbar. 458-02-000012, 001-00-000500, 438-03-000103, 438-03-000329, 438-03-000200, 326-01-000059, 409-01-000002, 458-01-000064, 325-01-000481
  - a. Snap / round parameters to practical values that are more appropriate for fabrication
  - b. The Snap feature supports the following structure parameters : Lower Trace Width (W1), Upper Trace Width (W2), Lower Ground Strip Width (G1), Upper Ground Strip Width (G2), Trace Separation (S1), Ground Strip Separation (D1), Trace Offset (O1)
  - c. The Snap To value for each parameter is held in the configuration settings, Tools | Options | Structure Defaults tab
2. The Material Library now supports materials with a dielectric thickness tolerance of 0%. Previous versions of Speedstack would prompt the user to enter a value greater than 0%. 001-00-000880
3. The Speedstack installer will now upgrade the existing version without needing to uninstall first.

## Version 21.11.17

### *Fixes*

1. On flex core materials, when selecting the upper or lower copper regions, the blue highlight did not always highlight the copper region. This is now resolved. 001-00-000883

## Version 21.11.01

### *Enhancements / changes / additions*

1. Material note enhancements. 458-01-000030, 438-04-000106, 001-00-000286, 001-00-000262, 438-03-000673

2. Core and Flex Core materials have now been expanded to support 15 notes fields. 5 x Upper Copper Notes, 5 x Dielectric Notes, 5 x Lower Copper Notes
3. RCC and Shield materials have now been expanded to support 10 notes fields. 5 x Copper Notes, 5 x Dielectric Notes
4. Material Library updated to support new material note properties
5. Material library import & export CSV / text file format for Core, Flex Core, RCC and Shield materials has been expanded to support the new material note properties
6. Stack up editor and Printing updated to support new material note properties
7. New import / export XML STKX v23.00 and SSX v13.00 file formats to support the new material note properties
8. CSV export option enhanced to support the new material note properties
9. Online Library. On-Premise Mode now provides an Application Note link with details on how to configure the on-premise mode library and obtain the latest material library data

#### Fixes

1. When adding an impedance structure to a core from the right-click menu, the electrical layer was sometimes deselected if the Controlled Impedance tab wasn't selected. This has now been resolved. 458-02-000011

## Version 21.07.08

#### *Enhancements / changes / additions*

1. New drill cap feature. Two new properties have been introduced: First Layer Capped, Second Layer Capped. The Add Drill and Drill Properties dialogs have been updated with checkboxes to identify whether a drill is capped - 442-02-000095, 001-00-000850, 001-00-000550, 442-02-000217
  - a. For mechanical through plated drills it is now possible to cap the First Layer, the Second Layer or both
  - b. For laser through plated drills it is now possible to cap the First Layer
2. Graphics and Printing updated to support new drill capped properties
3. New import / export XML STKX v22.00 and SSX v12.00 file formats to support the new drill capped properties
4. CSV export option enhanced to support the new drill capped properties

#### Fixes

1. Structures are sometimes removed from the Master stack up when sub-stacks are created using the Add Stack - Define by Layers option - 001-00-000871

## Version 21.05.06

#### *Enhancements / changes / additions*

1. New Layer Name property added to the electrical / copper layer element of a material for Foils, Cores, Flex Cores, RCCs and Shields. Speedstack will continue to use the automatic layer numbers but this new text field allows users to key in their own layer names
2. Layer Name supported in the Properties dialog, Selected Item Information grid and mouse over the electrical layer where the Layer Name will now display alongside the layer number and the amount of structures
3. Graphics and Printing updated to support new Layer Name property
4. Configuration Options | General | Display Field 5 now supports Layer Name as a user-selectable option so that it can be displayed alongside the stack up graphic

5. For first time installation the Configuration Options | General | Display Field default settings have been changed as follows:
  - a. Display Field 3 = Description (as before)
  - b. Display Field 4 = Dielectric Constant / Loss Tangent
  - c. Display Field 5 = Process Thickness
6. New import / export XML STKX v21.00 and SSX v11.00 file formats to support Layer Name property
7. CSV export option enhanced to support the new Layer Name property
8. Gerber export option enhanced to support the new Layer Name property
9. DXF export option enhanced to support the new Layer Name property
10. The number of Copper Finishing classes has increased from 4 to 20. User selectable plating thicknesses under Finishing Options (Copper Coverage & Simple % Methods) - 438-04-000191, 001-00-000868

## Version 21.04

### *Enhancements / changes / additions*

1. Frequency Dependent Calculations enhancements. The All Losses plot y-axis and data series labelling has been improved. Now easier to distinguish between Smooth Conductor Loss and Conductor Loss with Roughness - 473-03-000011
2. Frequency Dependent Calculations enhancements. The result data grid column labelling has been improved. Now easier to distinguish between Smooth Conductor Loss and Conductor Loss with Roughness - 473-03-000011
3. Printing. The All Losses plot y-axis and data series labelling has been improved. Now easier to distinguish between Smooth Conductor Loss and Conductor Loss with Roughness - 473-03-000011
4. CalcEngine. Updated to the latest edition (v21.03.01)
5. Frequency Dependent Calculations graphing enhancements. Now supports the latest edition of the PolarGraph library (v20.10) to match the version delivered with the Si8000m and Si9000e

## Version 21.03

### *Enhancements / changes / additions*

1. New Apply Plating Colours toolbar option. Automatically assign different colours to plated and un-plated copper layers. Plated layers are determined by checking the copper base and finished thickness, Plated = boolean(finished thickness > base thickness)
2. The Tools | Options | Colours has two new customisable colours that can be specified for plated and un-plated copper layers
3. Online Library. Rename supplier from Hitachi to Showa Denko - 001-00-000854
4. Online Library. Tatsuta now added to the Supplier Filter option - 001-00-000860
5. Online Library. More frequencies added to the 'Filter by Frequency' option - 001-00-000855
6. Online Library. When On-Premise mode is selected a single call to check internet connectivity sometimes causes a 'The remote name could not be resolved' message if no internet connection available. This has now been resolved. 001-00-000856, 470-02-000014
7. Printing. For rigid-flex designs with sub-stacks, long sub-stack names on the overview page could sometimes be truncated. This is now detected and word wrapped over multiple lines - 438-04-000183
8. Printing. When generating a report the page numbering / total pages numbering has now been corrected - 001-00-000861

9. More robust error handler code for instances where Speedstack.exe.config is missing / corrupt

## **Version 21.02**

### *Enhancements / changes / additions*

1. New Shield material added - 438-02-000122, 438-03-000478, 458-02-000007, 001-00-000369, 438-03-000294, 438-03-000427, 438-03-000428, 429-03-000020
2. Graphics and Printing updated to support new Shield material
3. New import / export XML STKX v20.00 and SSX v10.00 file formats to support new Shield material
4. CSV export option enhanced to support new Shield material
5. Gerber export option enhanced to support new Shield material
6. DXF export option enhanced to support new Shield material
7. Structures: When adding to the stack up an additional check has been added to detect when the Finished Thickness of the Reference Plane is less than 1um
8. File | Export menu now contains a Support Information option to display an application note detailing the latest Polar export information
9. CalcEngine. Updated to the latest edition v20.08.24
10. FlexNet Publisher / FLEXIm v11.17.2 now supported

### *Fixes*

1. Export: The Gerber and DXF export options now correctly supports the copper surface information for RCC materials
2. Printing: Problem where some drills were not printed when the stack up spanned multiple pages has now been resolved

## **Version 21.01**

### *Enhancements / changes / additions*

1. FlexNet Publisher / FLEXIm v11.17.2.0 supported

## **Version 20.11**

### *Enhancements / changes / additions*

1. Online Library. Improved workflow aiding more rapid download of library files - 458-01-000111
2. Online Library. ShengYi now added to the Supplier Filter option
3. Material Library. Import Library support improved for European nations that use a comma as the decimal symbol - 479-02-000047, 438-03-000727

## **Version 20.09**

### *Enhancements / changes / additions*

1. Online Library. Nan Ya Plastics now added to the Supplier Filter option
2. Online Library. Updated to support Pure-FTPd secure FTP daemon v1.0.49 - 001-00-000847
3. Printing. When generating the technical report it is now possible to select all pages, a page range or an individual page - 438-04-000134

### *Fixes*

1. For Core and Flexible Core materials, when using Properties | Remove Copper option to create a single-sided core, drills are sometimes incorrectly removed when adding a sub-stack. This has now been resolved - 001-00-000840, 438-04-000132

## Version 20.06

### *Enhancements / changes / additions*

1. Drilling Enhancements. New Back Drill Minimum Distance From Must-Not-Cut Layer and Back Drill Maximum Distance From Must-Not-Cut Layer added - 001-00-000844, 442-03-000009
2. New import / export XML STKX v19.00 and SSX v9.00 file formats to support new drill features
3. CSV export option enhanced to support new drill features
4. Printing: Improvements to Bill-of-Materials table to better support sub-stacks - 001-00-000843

### *Fixes*

1. Printing: When printing in wide-stack mode the mixed layer appearance on the overview page has now been corrected - 001-00-000842

## Version 20.05

### *Enhancements / changes / additions*

1. Drill Enhancements. The number of stack up columns available for drilling information has been increased from 6 to 11
2. Graphics and Printing updated to support new Drilling features
3. New import / export XML STKX v18.00 and SSX v8.00 file formats to support new drill features
4. Online Library. New Filter by Frequency option to select libraries where the dielectric constant / loss tangent data is specified at a known frequency
5. Online Library. New material families added for Arlon, Isola, ITEQ and TUC

### *Fixes*

1. Printing: Solder Mask Thickness dimension arrows - 438-04-000091
2. Printing: a problem that sometimes occurred with the drill graphic on the overview page has now been resolved - 001-00-000838
3. Solder Mask Properties dielectric constant and loss tangent decimal precision (mask) now fixed to 4 decimal places regardless on units selected - 001-00-000841
4. Export to CSV where data contained in language resource files sometimes caused an error - 479-02-000025, 001-00-000836

## Version 20.02

### *Enhancements / changes / additions*

1. Enhancements to the Navigator graphics
2. Enhancements to the Technical Report

## Version 20.01

### *Enhancements / changes / additions*

1. Drilling Enhancements:
  - a. Minimum Pad Size, Minimum Drill Size, Minimum Drill Size Tolerance and Minimum Barrel Wall Thickness fields added to the Hole Information section - 438-03-000479



- b. Five Note fields added - 458-01-000029, 438-03-000388, 473-02-000018
  - c. New Back Drill type now supported. Back Drill Must Cut Layer No, Back Drill Must Not Cut Layer No, Back Drill Minimum Distance From Cut Layer, Back Drill Maximum Distance From Cut Layer, Back Drill Primary Drill Size fields added - 458-01-000021, 473-02-000017, 429-03-000048
- 2. Graphics and Printing updated to support new Drilling features
- 3. New import / export XML STKX v17.00 and SSX v7.00 file formats to support new drill features
- 4. CSV export option enhanced to support new drill features
- 5. Gerber export option enhanced to support new drill features. The new Minimum Pad Size, Minimum Drill Size, Minimum Drill Size Tolerance and Minimum Barrel Wall Thickness fields have been added to the export file but the Back Drilling graphic is not supported in the Gerber output
- 6. DXF export option enhanced to support new drill features. The new Minimum Pad Size, Minimum Drill Size, Minimum Drill Size Tolerance and Minimum Barrel Wall Thickness fields have been added to the export file but the Back Drilling graphic is not supported in the DXF output
- 7. The File | Export | Mentor Graphics sub-menu now contains just the V11.00 and V12.00 of STKX that are the versions supported by Mentor - 001-00-000795
- 8. Four selectable plating thicknesses added under Finishing Options (Copper Coverage & Simple Percentage Methods) - 429-03-000038
  - a. Removed the need for XML Schema for the saving of these options.
  - b. Options are saved under a new filename (FinishingMethodSettings.optx)
- 9. Material Library and Virtual Material Stack Up Wizards. Increased the layer count limit from 64 to 128 - see ticket 458-02-000006
- 10. Frequency Dependent Calculations graphing enhancements. Now supports the latest edition of the PolarGraph library (v19.08) to match the version delivered with the Si8000m and Si9000e
- 11. CalcEngine. Updated to the latest edition (v19.11.22)
- 12. Cleaned up some visual glitches in Flex Navigator
- 13. Coverlay. In Virtual Material Mode the coverlay base thickness parameter value is now read-only to match other material types - 001-00-000807
- 14. When saving stack up designs with controlled impedance structures, a warning is now displayed if either File | Save Stack As or File | Save Stack are selected. The user can still save the stack up only file format (.STK) but are now warned that structure data will be lost - 438-03-000330, 440-03-000021
- 15. Swap Material. Retain Data FileName for solder mask and ident materials when swapping with other items in library - 001-00-000772
- 16. Online Library. TUC now added to the Supplier Filter option
- 17. Shortcut for Tools-Set Finishing Method now changed to SHIFT + CTRL + M (001-00-000801)

#### Fixes

- 1. Printing: where a table header block may be left isolated at the bottom of a page where there is just enough space for the header but not enough for the first data row, resulting in the next page starting another header block.
- 2. Printing: where if the Footer is disabled sub-stacks cover page will not print properly.

## Version 19.05

#### *Enhancements / changes / additions*

- 1. DRC Resin Check / Excess Resin. Algorithm enhanced to offer better support for sequential build stack ups - 438-03-000615, 438-03-000397, 477-01-000007, 473-01-000021

2. Convert to Core. When converting two Foils to a single Core material the lower copper Trace Inverted flag is now automatically set to true. This speeds up the Convert to Core operation, in previous versions of Speedstack it was necessary to set the Trace Inverted flag on the foil prior to using the Convert to Core function - 458-01-000122
3. Convert to Core. It is now possible to convert two Foils to either a Core or a Flexible Core material - 001-00-000586
4. Online Library. The Ventec logo has now been updated
5. CalcEngine. Causal surface roughness calculation improvements
6. Help | Latest Versions option added to display web pages detailing the latest Polar product versions
7. Printing: Added ability to sort Impedance table that groups Single-Ended structures together followed by Differential structures together, per-layer - 429-03-000040  
Option found under menu [Options->Controlled Impedance Data table->Sort Structures in SE/Diff Order Per Layer]
8. Printing: New Footer Section under options allowing ability to:
  - a. Hide / Suppress the Footer - 429-03-000056
  - b. Show an alternative/expanded footer that will accommodate long stack names - 438-03-000682
  - c. Override Main Footer labels to user-definable ones - 438-03-000682
 Options found under menu [Options->Footer...]
9. Printing: Stack thickness value (on the left-side of the stack) has its own decimal accuracy setting - 442-02-000210  
Option found under menu [Stack Data Table->Stackup Thickness Decimal Accuracy]
10. Structure Layer Properties dialog. Altered layout to suit Asia Pacific Windows (Japanese, Simplified Chinese and Traditional Chinese) - 001-00-000793

#### Fixes

1. Bug in Wizard where doing a Core build results in the stack up thickness with solder mask value being incorrect

## Version 19.01

### *Enhancements / changes / additions*

1. Material Library enhancements. New loss tangent field added to eight materials, Core, RCC, Prepreg, Solder Mask, Flexible Core, Bondply, Adhesive and Coverlay – 458-01-000054, 458-01-000074, 458-01-000075, 438-03-000328, 429-03-000022, 440-03-000036
2. Stack Up Editor enhancements. Loss tangent field now supported within the stack up editor for the appropriate materials:
  - a. Add, swap, copy / paste materials, symmetry mode functions updated to support loss tangent
  - b. Updated properties dialogs to support loss tangent
  - c. New selectable display columns for 'Loss Tangent' and combined 'Dielectric Constant / Loss Tangent' next to stack up graphical image
3. Frequency Dependent Calculations enhancements. The Dielectric Constant Ref Er field(s) and Loss Tangent Ref TanD field(s) may now be populated from the stack up materials. The new 'Set Dielectric Constant (Er) from Stack Up materials' and 'Set Loss Tangent (TanD) from Stack Up materials' checkboxes allow the user to nominate which data from the stack up auto-populates the Ref Er and Ref TanD columns, deselecting allows the user to key in the value(s)
4. Printing. New selectable 'Loss Tangent' column for the stack up data table
5. Virtual Material Mode wizard updated to support loss tangent.
6. Updated bi-directional copy / paste interface between Speedstack and Si9000e now with improved support for loss tangent (Ref TanD)

7. New import / export XML STKX v16.00 and SSX v6.00 file formats to support loss tangent and new drill fill types
8. IPC-2581 Rev B import / export options enhanced to support loss tangent
9. CSV export option enhanced to support loss tangent
10. Gerber export option enhanced to support loss tangent
11. DXF export option enhanced to support loss tangent
12. Rigid-Flex Improvements. When introducing air gaps into a sub-stack that previously had contiguous materials it is now possible to reassign this sub-stack to one that contains mini-stacks, by using the 'Reset Mini-Stack Settings' option from the Navigator menu. This is especially useful when designing 'book-binder' or 'doublet' rigid-flex constructions.
13. Online Library. When using On-Premise Mode no calls are now made to ftp://polarinstruments.com to check whether it is reachable. Previously, this check in itself can cause an error if no internet connection is available – 470-02-000014
14. Online Library. Pillar now added to the Supplier Filter option - 468-01-000028
15. Drill / Via Fill Types. Non-Conductive, Conductive, Sintering Paste and Copper Paste fill types have now been added - 473-02-000015
16. Configuration Options. When Speedstack is installed for the first time the licensing will default to the Si9000e link rather than the Si8000m link - 001-00-000773
17. Configuration Options. The option to set the amalgamated dielectric constant threshold has been deprecated. New amalgamation algorithm implemented
18. Ucamco Interface. The File menu 'Save and Continue' and 'Save and Quit' options now support the SSX v6.00 file format – 001-00-000777
19. Ucamco Interface. The File menu 'Discard and Quit' message has been altered to clarify functionality - 001-00-000778
20. Material Library. The Description column default width in the material library has now increased to 300 pixels for all material types - 438-03-000639
21. Impedance and Insertion Loss Calculations – new calculation engine supported. These improvements may slightly alter the calculation results
  - a. New amalgamation algorithm – now amalgamates multiple substrates to a single substrate for both dielectric constant and loss tangent
  - b. Modifications implemented to support causal surface roughness
  - c. Differential Offset Coplanar Strips 2B2A – substrate three (H3) and four (H4) calculation corrected - 001-00-000756
22. Printing. Legacy print options have been deprecated – 438-03-000620

#### Fixes

1. Behaviour difference between Add CI Structure menu item and impedance toolbar '+' button. The dialog to nominate how mini-stacks should be handled does not appear when the Add CI Structure menu item is selected – 001-00-000771
2. Printing. On some occasions the 'Stack Up Thickness (laminates to laminates)' option did not correctly include the foil thickness on sequential lamination builds. This is now resolved - 479-01-000017

## Version 18.08

#### *Enhancements / changes / additions*

1. Updated Export to IPC-2581 Rev B option with interactive interface. Now supports stack up material and structure information (458-01-000016, 458-01-000087, 001-00-000649, 001-00-000746, 438-03-000519, 438-03-000521, 438-03-000519)
2. New Import IPC-2581 Rev B option with interactive interface. Supports stack up material and structure information (438-03-000262, 429-03-000031, 468-01-000020, 458-01-000051)

3. Online Library. New On-Premise Mode to allow for users who cannot connect to ftp://polarinstruments.com due to network security restrictions (473-01-000009, 473-01-000008, 464-01-000029, 438-03-000585, 001-00-000734)
4. New Coplanar Structure support. Eight new structures have been added, requested specifically for flex and rigid-flex designs (429-03-000028, 458-01-000039, 001-00-000706, 438-03-000514, 427-01-000044, 429-03-000046)
  - a. Four new single-ended structures: Offset Coplanar Strips 1B2A, Offset Coplanar Strips 2B2A, Offset Coplanar Waveguide 1B2A, Offset Coplanar Waveguide 2B2A
  - b. Four new differential structures: Differential Offset Coplanar Strips 1B2A, Differential Offset Coplanar Strips 2B2A, Differential Offset Coplanar Waveguide 1B2A, Differential Offset Coplanar Waveguide 2B2A
5. Tools | Options | Licensing tab has new layout to more clearly define the Speedstack PCB and Speedstack Si bundles (442-02-000227)
6. New import / export XML STKX v15.00 and SSX v5.00 file formats to support eight new coplanar structures
7. Updated import / export XML STKX v14.00 file functionality now supports <Structure> <T1> trace thickness value. Previously, this was determined from the electrical layer <FinishedThickness> value but now also added to <Structure> for completeness
8. Update the import / export XML STKX v14.00 and SSX v4.00 so that files are transferable between Windows locales where the decimal symbol changes from decimal point to a comma (001-00-000754)

#### Fixes

1. Fixed a problem where the context menu keeps showing drills menu after a copy & paste stack operation (001-00-000738)
2. Fixed a bug where symmetrical drills not being deleted when Symmetrical Mode is On (001-00-000741)

## Version 18.05

#### *Enhancements / changes / additions*

1. Frequency Dependent Calculations
  - a. New Cannonball-Huray method added to Surface Roughness Compensation options. This requires the entry of Matte and Drum side Rz values
  - b. Updated bi-directional copy / paste interface between Speedstack and Si9000e allows for quick transfer of structure parameters between products – Cannonball-Huray parameters now supported
  - c. New import / export XML STKX v14.00 and SSX v4.00 file formats to support Cannonball-Huray parameters
2. Material Online Library Enhancements
  - a. New ITEQ core and prepreg materials
  - b. ITEQ now added to the Supplier Filter option (468-01-000028)
3. Printing. New selectable 'Copper Layer Type' column to determine layer type; Signal, Plane etc. (458-01-000091)
4. Printing. New selectable impedance table 'Error %' field. Print the Error % between the Target and Calculated Impedance (469-02-000043)
5. Printing. Loss Graph page, the Cannonball-Huray Matte and Drum side Rz values added if the Enable Cannonball-Huray checkbox is selected

#### Fixes

1. Printing: Fixed a problem where Thickness arrowed lines may fall off further than the bottom of the stack

2. Printing: Fixed a problem where if Loss Graphs are on, but no FD data exists or have been set to not be included - then blank trailing pages were being printed (442-02-000226)
3. Printing: Fixed incorrect filename in print header, was showing <filename>.stk even when an <filename>.sci file was opened
4. HDI Build | Drill Plan: Fixed a problem where the Drill Hole Count property was not always transferred correctly from the master stack to the auto-created sub-stacks (458-01-000092)

## Version 18.03

### *Enhancements / changes / additions*

1. Frequency Dependent Calculations
  - a. Amalgamated dielectric structures now support frequency dependent calculations
  - b. New 'Set Er values from Stack Up materials' checkbox. Selecting this checkbox auto-populates the Ref Er column, deselecting allows the user to key in the value(s)
  - c. New 'Include Loss Graph for this structure on the report' checkbox allows the user to nominate which structures will contain a separate loss graph page
  - d. The 'Frequency of Interest' results section of the report now match the Result Presentation setting, allowing the Loss results to be shown in dB/m, dB/inch or dB/LL (length of line). Previously, only the native CalcEngine results in dB/m were used.
2. Printing. New user-selectable options to show a dimension arrow for 'Stack Up Thickness (solder mask to solder mask)' and 'Stack Up Thickness (lamine to laminate)' (438-03-000461)
3. Printing. Stackup Cost and Hatch Profile Data now separated from Thickness Totals, and can be turned on and off from menu. (458-01-000099)
4. License feature change. The new 2018-style license features support additional data such as Polarcare Contract information. Please note, 2018 features will not support pre-v18.x versions of our products

### Fixes

1. Fixed: Printing: When an RCC is used and the Processed Thickness column is selected the dielectric finished thickness is missing (001-00-000720)
2. Fixed: The File | Properties dialog revision information display problem that occurred with Win 7 when using font scaling at 125% is now resolved (458-01-000098)

## Version 18.01

### *Enhancements / changes / additions*

1. Frequency Dependent Calculations:
  - a. New frequency dependent calculation capability added to Speedstack where insertion loss can be graphed over a user-specifiable frequency range
  - b. Additional frequency dependent structure properties added to allow for insertion loss calculation: trace conductivity, frequency range, result presentation mode
  - c. Extended substrate data supported: frequency vs dielectric constant / loss tangent
  - d. Surface roughness compensations modes supported: Smooth, Hammerstad, Grosse, Huray
  - e. Extensive graphing capability introduced: multiple data series options, pickable data points
  - f. Technical report extended to include insertion loss graphs
  - g. Bi-directional copy / paste interface between Speedstack and Si9000e allows for quick transfer of structure parameters between products

- h. New import / export XML STKX v13.00 and SSX v3.00 file formats to support frequency dependent structure properties

#### *Fixes*

- 1. Excess resin property / field does not unit switch correctly in the material library for adhesive and bondply materials. Now corrected. (001-00-000712)

### **Version 17.08**

#### *Fixes*

- 1. The warning message displayed when the SCI / STK file version is newer than that supported by Speedstack is now corrected (001-00-000704)
- 2. When reading the <ExcessResin> element from XML files STKX v11.00, v12.00 and SSX v1.00, v2.00 the data was not imported correctly unless the units were set to microns. Now corrected. (473-01-000024)

### **Version 17.07**

#### *Enhancements / changes / additions*

- 1. Online Material Library Enhancements
  - a. New Circuit Foil and Mitsui foil materials
  - b. New ITEQ core materials
  - c. Circuit Foil and Mitsui now added to the Supplier Filter option
- 2. Impedance Calculations
  - a. New calculation engine supported. This matches the calculation engine v17.03 supplied with Si8000m / Si9000e v17.07
- 3. Proportional View Enhancements
  - a. Improved support for mixed signal / ground electrical layers

### **Version 17.05**

#### *Enhancements / changes / additions*

- 1. Material Library Enhancements
  - a. New Online Library facility to download the latest material libraries. Quickly and easily download the preferred materials from the Polar Online Library
  - b. New Open and Append Library option. Append library data to the existing material library file which allows the user to quickly 'mix and match' data from different material suppliers
  - c. New Clear Current Data Table option. Clear an individual material type (Foils, Prepregs, Cores etc) whilst leaving the remainder of the material library unchanged
- 2. Proportional View Enhancements
  - a. Corrections to the display of isolation distance thicknesses (001-00-000687) plus the start-up zoom level of the stack up has been improved
- 3. UCAMCO Script/Batch Option Improvements (001-00-000698)

#### *Fixes*

- 1. Material Library, when the RCC material tab is empty the Filter option for Prepreg materials was incorrectly disabled - now resolved (001-00-000674)
- 2. Material Library, when using the import / export option to CSV or TXT file the Excess Resin values are not handled correctly unless the units are set to microns - now resolved (438-03-000396)

### **Version 17.04**

### *Enhancements / changes / additions*

1. Material Library Enhancements
  - a. Import and Export to CSV / TXT file now allows for individual material data tables to be exported and imported without needing to clear the whole library. This provides a better workflow when using third-party software to edit the library such as Excel. Changes can easily be made to any material data table by exporting / importing, the imported data can replace or be appended to the existing data whilst leaving the other materials are left untouched
  - b. When opening a new material library the data is no longer appended to the existing data, it now replaces the current loaded library
2. Printing: New Isolation Distance (Summed) column added to the selectable stack data columns (429-03-000037)

### *Fixes*

1. Removed 'isolation distance' values wrongly showing for Ident / solder mask peelable materials
2. Printing bug where Isolation Distance values were not showing for adhesives and coverlays
3. Multiscreen environment - Navigator remove substack dialog always opens on screen 1 which can cause problems if screen 1 is not being used - hidden / missing dialog. Changed dialog StartPosition to CenterParent so now positions in centre of Navigator (001-00-000696)
4. If symmetry mode is enabled and a stack up wizard is called the symmetry toolbar will unpress but the toolbar image does not update - now resolved (001-00-000697)
5. Printing bug where thickness line doesn't account of prepregs above coppers in substacks (438-03-000508)

## **Version 17.02**

### *Enhancements / changes / additions*

1. STKX XML format. The STKX v11.00 export option has been modified so that the <Core> <LowerCopper> XML element names are renamed to LowerCuBaseThickness & LowerCuFinishedThickness to maintain compatibility with third-party systems

## **Version 17.01**

### *Enhancements / changes / additions*

1. Flex Navigator Display Positioning – ability added via material attributes
  - a. PolarDerivedMaterials.CMaterialAttribsProcessor (New Class)
  - b. Reset switch added to restore NVDP values back to zero
2. UCAMCO script/batch trigger options added to File Menu
  - a. Save & Continue
  - b. Save & Quit
  - c. Discard & Quit
3. Resolution check on startup now removed
4. Printing: Added C2, C3 and Trace Pitch Fields to CI table
5. Splash Screen can now be bypassed by holding down SHIFT KEY during startup
6. frmStackup.ApplyFinalFinishing completely rewritten. This now overcomes the situation where the HValues used by structures were sometimes incorrect for sub-stacks where the materials ONLY existed in the sub-stack (not enabled in the Master), most commonly used in bikini builds. The copper finished thickness was sometimes not correctly applied to the dielectric HValue property for those materials that were not enabled in the Master, the new function overcomes this issue
7. New SCI / STK v12 file format. New CSTMaterial.Attributes property, new CSS\_Structure.NetClass property to contain up to 5 x Net Classes, CSTFlexStackData.InfoFileRev4\_RevisionDate now correctly stored

8. New Net Class functionality. Five new Net Class properties can be stored per structure, accessible from the controlled impedance toolbar
9. SSX XML format enhancements
  - a. now uses CultureInfo.InvariantCulture to enforce decimal point usage. This should overcome the issue where SSX files exported in regions where the locale uses comma as a decimal symbol (Germany etc.) would not be read in regions where the decimal symbol is a point.
  - b. now includes improved support for multiple coating parameters (C1, C2, C3, CEr). Previously, only the C1 parameter was imported, C2 and C3 were set to the same value
  - c. v2.00 updated to include the new material attributes and structure net classes
  - d. export option provides capability to export to multiple versions, 1.00 or 2.00, in order to maintain compatibility with third-party systems
10. STKX XML format enhancements
  - a. now uses CultureInfo.InvariantCulture to enforce decimal point usage. This should overcome the issue where STKX files exported in regions where the locale uses comma as a decimal symbol (Germany etc) would not be read in regions where the decimal symbol is a point. 001-00-000572
  - b. v12.00 includes the following changes
    - i. <FileRevision> – removed, replaced with 4 x Revision(n)Number, Revision(n)Editor, Revision(n)Number, Revision(n)Date properties
    - ii. <StackChanged> – removed
    - iii. <Filename> – removed
    - iv. <Version> – only a single Version is now specified in the Header section for the whole file, previous versions of the STKX format had separate <Version> definitions at the start of each section
    - v. <Attributes> – new property added to all materials
    - vi. <SolderMask> <SolderMaskMask> <Colour> – colour text field has been renamed to <MaskColour> in order to differentiate it from the new RGB colour data
    - vii. <Ident> <IdentInk> <Colour> – colour text field has been renamed to <InkColour> in order to differentiate it from the new RGB colour data
    - viii. <Peelable> <PeelableMask> <Colour> – colour text field has been renamed to <InkColour> in order to differentiate it from the new RGB colour data
    - ix. <Colour> – RGB colour properties added to all materials, separate colour definitions for each material element – for instance a <Core> supports a separate colour definition for the <UpperCopper>, <CoreDielectric> and <LowerCopper>
    - x. <StructureNumber>, <H1>, <Er1>, <H2>, <Er2>, <H3>, <Er3>, <H4>, <Er4>, <C1>, <C2>, <C3>, <CEr>, <NetClass1>, <NetClass2>, <NetClass3>, <NetClass4>, <NetClass5> – new properties added to Structure
  - c. export option provides capability to export to multiple versions, 11.00 or 12.00, in order to maintain compatibility with third-party systems
11. Display / Printing: Mask Thickness now added to the Processed Thickness column. This now allows the user to select a single Process Thickness column to contain all critical info for both display and printing
12. DRC. The Design Logic check now detects single-sided cores, adhesives and bondply materials beyond the outer copper layers – the new DRC error message for these occurrences is 'External Dielectric'
13. DRC. If the Design Logic check detects errors with a stack up it is not possible to add structures. It is now possible to disable the Design Logic check and continue to add



structures to the 'valid' part of the stack up. Messages have been introduced into Speedstack to guide the user when these situations occur

14. Hatch. Guidance return path notes added when copper coverage is less than 40 percentage
15. Proportional view. Beta feature that displays the stack up where the material thicknesses are proportional to each other. This can be informative as a visual aid, especially when considering the dielectric thicknesses between electrical layers

#### *Fixes*

1. Fixed: Printing: bug where print queue order is missing items, showing only the stack table being available.
2. Fixed: Keyboard shortcut for opening Config Options clashed with Open stk shortcut, changed Config Options shortcut to Ctrl+, (comma)
3. Fixed: Soldermask will no longer display Base and Finished Thickness
4. Fixed: Mask Thickness added to Data Field 5 (graphics display)

### **Version 16.03**

#### *Features*

1. Printing: Bill of Materials table (BOM) With barcoded stock-number support added to Print Report. (001-00-000625)
2. Printing: Default folder path for custom print settings files can now be set under main configuration settings. (438-03-000356)
3. Printing: Quickly scroll through pages using mouse wheel.
4. SI\_Image Control (structure image control) updated.
5. Splash Screen and About dialogs updated.
6. Splash delay-time increased.

#### *Fixes*

1. Default file locations in \* .inx config file causes crash when paths are empty
2. Printing: Drills Data Alignment menu checkbox was always fixed to 'left' regardless of settings

### **Version 16.01**

#### *Features*

1. It is now possible to retain and re-allocate structures when changes are made to the electrical layers of the stack up. Structure Layer Properties and Structure Validation toolbar options have been introduced to the Controlled Impedance tab to allow the user to re-allocate structures after the following stack up changes:
  - a. Add foil / core - increase layer count
  - b. Delete foil / core - reduce layer count
  - c. Move foil / core up and down, beyond another copper layer - maintain layer count but perhaps to swap two different thickness cores within the stack up
  - d. Copy / paste foil or core - increase layer count
  - e. Change layer type - signal to plane, plane to signal, mixed to signal or plane, signal to hatch, hatch to signal.
  - f. Delete rigid core and add flex core - to maintain layer count but swap material type
  - g. Delete a rigid core and add two foils - to maintain layer count but switch to an HDI type build

#### *Fixes*

1. Fixed Windows XP problem when trying to save a newly created stack file. Issue related to older config paths containing trailing backslash (which is no longer needed in latest v1 5.10 onwards) (438-03-000348)

## **Version 15.10**

### *Features*

1. Application configuration files now moved to the Windows-compliant folders.
  - a. Windows Vista, 7, 8, 10: \Users\<UserName>\AppData\Roaming\Polar
  - b. Windows XP: \Documents and Settings\<UserName>\Application Data\Polar
2. Support for Windows 10
3. FlexNet Publisher / FLEXlm v11 .13 now supported

### *Fixes*

1. Fixed problem when using the Copy to Si Project option where the REr parameter value was not transferred to the clipboard correctly. (438-03-000331)

## **Version 15.07**

### *Features*

1. Copy / Paste Structure data between Si8000m / Si9000m and Speedstack. The existing copy / paste structure clipboard format used with Speedstack has been updated to accommodate new data
2. Copy from Speedstack to Si8000m / Si9000e Project. A new toolbar option has been introduced to Copy a group of structures from Speedstack and place them onto the clipboard. These structures may then be pasted directly into the Si8000m / Si9000e Project group
3. User Interface Language. The user interface language is now selected from a new Tools | Language option, the options available are dependent upon the Speedstack language packs installed.
4. Additional menu keyboard shortcuts assigned

## *Fixes*

1. Fixed problem in printing where notes for the last sub-stack were printed in notes section for every sub-stack (438-03-000316)
2. Fixed problem with Tools | Options | Rebuild and Calculate Structures - selections did store correctly (001-00-000571)
3. Fixed problem with Export to CSV option where extremely large contiguous text string sometimes caused an exception error (001-00-000579)
4. Old password tab completely removed from configuration dialog

## **Version 15.05**

### *Features*

1. Speedstack now built on later development platform
2. Export to Ucamco Integr8tor and Ucam option. New option added to Export menu for Ucamco integration project. XML .SSX format
3. Import Ucamco Integr8tor and Ucam option. New option added to Import menu for Ucamco integration project. XML .SSX format
4. Support Speedstack command line launch with XML .SSX files
5. Export / Import Ucamco Integr8tor and Ucam option secured by new SPEEDSTACK\_UCAMCO license feature, Tools | Options | Licensing allows this option to be selected
6. Support Speedstack command line launch with Ucamco .JOB files
7. Export to Cadence Allegro option
8. Export to Mentor Graphics option
9. Export to Zuken CR-8000 option
10. Import from Zuken CR-8000 option
11. Most Recently Used (MRU) list added to the File menu
12. Improved Material Library locking feature using a password.
13. Printing: Stackup Thickness / Board Thickness now has separate number accuracy setting (001-00-000556)
14. Warning is now given when user attempts to delete all structures (001 -00-000480)
15. Command line launch capability controlled by the claimed license feature. .stkx, .job and .ssx can only be opened via the command line if the appropriate license feature is available.
16. It is now possible to select Speedstack Flex / HDI Navigator and use the option without requiring either a Si8000m or Si9000e licenseStack Up Cost added to the Stackup Information data grid and the technical report totals area. Stack Up Cost is the sum of all the enabled materials within a stack up
17. Autostack feature removed

### *Fixes*

1. No warning to save file changes was given after structures are re-calculated/re-built despite knowing that the file has definitely changed since opening/saving. (442-02-000098)
2. Printing: when turning off the file-path in header it also removes the unit data. (438- 03-000247)
3. When adding sub-stack using a layer range and a single-sided core is one of the layer extents. Fixed (001-00-000551) / (001-00-000502)
4. Saving stk throws error after importing an stkx file from location that doesn't match file location in the stkx file. (001-00-000525)
5. Printing: Data filename was not appearing for solder masks in printout.
6. Material Library. Filter bug where an invalid criteria string will cause crash. (438-03- 000306)
7. Minor annoyance where if the last opened file saved in config file cannot be found, that file path is removed from the config.
8. Printing. Thickness totals spills off the page if Hatch profile is used.
9. Setting of material colours not working when language is set to German. (438-03- 000312)

## Version 14.09

### Features

1. Export to IPC-2581 Rev B. Enhancements including the use of a period (".") as a decimal symbol in floating point numbers regardless of locale (438-03-000124)

## Version 14.05

### Features

1. New Export to IPC-2581 Rev B interface (001-000-000206, 001-00-000258)
2. Updated Import Ucamco .Job File interface to support latest file formats (438-03-000031, 438-03-000048)
3. Minor change to structure browser index control – lowercase 'of' now used to improve clarity of display
4. Printing now retains the last-used printer as well as the last-used paper-size, rather than using the default printer / paper-size as defined under windows. Defaults will be used where a printer or paper-size is unrecognised or is unavailable
5. Printing now supports users who regularly want to switch between different language locales in order to send documentation to their internal and external suppliers (001-00- 000461)
6. Printing Stack Thickness values (beside the stack) now obeys the user selectable number format settings (442-02-000084)

### Fixes

1. Stack properties now displayed ready for user input after Material Library Mode Wizard is used (438-03-000037)

## Version 14.02

### Features

1. New Copy / Paste Material Properties
  - a. Provides functionality to copy all properties from selected material and then paste user-selectable property groups to other materials
  - b. Supports multi-selected materials for rapid stack up changes
2. New Material Library Wizard
  - a. Extra Prepreg Fields
  - b. Plane & Mixed Layer support
  - c. Displays running Thickness Total
3. New Laser Stacked via type
  - a. Adds multiple laser stacked vias in a single operation
4. Updated Set 'Stackup Thickness / Enable Finishing dialog
  - a. Tolerance values can now be entered as either a percentage or an absolute value dialog will default to % upon loading
5. Menu text changes
  - a. Tools | Set Finishing Options now renamed Tools | Set Finishing Methods
  - b. Tools | Set Target Thickness / Finishing Options now renamed Tools | Set Target Thickness / Enable Finishing
  - c. Materials are now grouped more logically into rigid / flex / other sections within menu system
  - d. Right-click stack up editor menu items now match order of toolbar
  - e. Copy / Paste Material Properties now added to the right-click menu
6. Set Finishing Methods now has URL to the AP507 application note
7. Configuration defaults
  - a. The default for Maximum Laser Drilled Via is now 5. Previously 1
  - b. The default for Amalgamated Dielectric Differential Threshold is now 1.0. Previously 0.5

8. Toolbar icons and menu entries are now always enabled regardless of tab selected (Stackup Editor | DRC | Controlled Impedance)
  - a. Previous versions disabled certain options to indicate when that they should not be used during the stack building process but this resulted in a lot of switching between tabs
9. When adding drills, the drill-type, fill-type and plating are remembered for when another drill is added (speeds up repetition)
10. Symmetry Mode button is now more obvious when it is On / Off
11. Ability to delete all drills from the stack in a single operation - new context menu
12. Printing: Drills (Drills Table) order sorted by start-end layer order or creation order (user option)
13. New Library Mode / Virtual Material Mode toggle toolbar option
14. Saving file on shutdown now saves a .sci file with impedance structures rather than a .stk file without impedance structures
15. Target Stack Up Thickness now added to the Stack Up Information grid

### *Fixes*

1. Fixed bug where the stack properties dialog still appears even after cancelling the virtual-material-mode wizard
2. String "Layer can only be Mixed or Plane" used in VMM wizard was not localized, now reads: "Conflicting Layer Types - Layers cannot be both planes and mixed at the same time."
3. RCC Property bug: Remove Copper checkbox now properly disabled Fixed
5. Printing bug: Fixed Thickness Tolerance accuracy according to units
6. Printing bug: Fixed incorrect toolbar icons
7. Main UI bug: Keyboard shortcut for Undo now working
8. Finished Thickness bug fixed when the .Net Framework v1 .1 is used
9. Main UI bug: Zoom extents bug when Navigator is not docked - fixed.
10. VM Wizard bug: Drill Section - Deleting a drill when there are none crash - fixed
11. Main UI: Zoom extents bug fixed when RCC is the top layer

## **Version 13.06**

### *Features*

1. New Rebuild and Calculate Structure configuration options have been introduced. These options allow the user to determine whether the impedance structure parameters are populated automatically from the stack up or manually entered by the user. 001-00-000351
2. Printing: new fields have been introduced to the impedance table of the technical report (H1, H2, H3, H4, Er1, Er2, Er3, Er4, T1 C1, and CEr). 001-00-000351
3. Printing: Field selections are now stored as a Field IDs, no longer as literal strings. This overcomes potential problems when the Speedstack language is switched 001-00-000395
4. Printing: The RCC material was not always rendering correctly on the overview page (copper was sometimes drawing on top of the dielectric - positioning problem). This has now been resolved. 001-00-000388
5. Virtual Material Mode / Simple Percentage Method conflict. A warning dialog has been added to Speedstack if Virtual Material Mode AND Simple Percentage Method are selected. 001-00-000392
6. Controlled Impedance Structures. When parameters are keyed in manually, the previously calculated result is cleared and a visual indicator is shown to highlight that recalculation is required. 001-00-000404
7. Export to CSV: Fixed issue with RCC materials that caused the Export to CSV to throw an exception. 001-00-000388
8. Structure Index control: The "All"/"L:1" button now reverts to "L:<layer selected>" after adding structures. 001-00-000395

9. Hatch profile: Resolved problem when hatch pitch / width is beyond the limits of the track bar (1 - 40 mils). An exception error was sometimes displayed in previous versions of Speedstack. 001-00-000398
10. Mouse over stack up data columns now shows the correct field name on lower-left status bar panel. 001-00-000405

## Version 13.03

### Features

#### 1. User Interface Enhancements

- a. A new Process Thickness field is now available as a Display Field shown on the stack up graphic. Processed Thickness is the Finished Thickness for copper layers and Isolation Thickness for dielectric layers.
- b. A more consistent number accuracy (precision) is now used for the dielectric constant, isolation distance and finished thickness fields shown on the stack up graphic.
- c. Improvements to the impedance structure highlighting when Advanced Structures are used.
- d. Opening / saving of SCI project files is now given more emphasis than the older STK file format throughout Speedstack.
- e. Alterations have been made to the controlled impedance tab scroll bar behaviour to accommodate Simplified / Traditional Chinese and Korean Windows 7 OS. Previous versions of Speedstack running on these versions of Windows OS were not also able to access parameters at the foot of the parameter list.
- f. During start-up Speedstack will check if the screen resolution is below 1280 x 1024 minimum specification and display appropriate warnings.
- g. The calculated impedance on the Controlled Impedance tab is now highlighted to make it stand out more than the other parameter fields.
- h. The Speedstack keyboard short-cuts have been reallocated to more Windows-like functionality. Short-cuts that originally use the Insert key have been changed to more suitable keys in order to support Apple keyboards.

#### 2. DRC Enhancements

- a. A new drill aspect ratio check for mechanical drills has been introduced.

#### 3. Printing Enhancements

- a. The selected Units are now printed on the title bar of the report.
- b. The print preview refresh issue when .Net Framework 1.1 was missing from the OS has now been resolved.
- c. Improvements have been introduced to the way RCCs are now printed.
- d. The dimension arrow line next to the stack up now finishes on the correct layer of the stack up image.

#### 4. Stackup Thickness Enhancements

- a. A new Solder Mask Thickness calculation has been added to the Stackup Information data grid
- b. A new stackup Thickness with Solder Mask calculation has been added to the Stackup Information data grid
- c. The presentation of the Stackup Information data grid has been improved to more clearly present the data
- d. A single Stackup Thickness definition is now used throughout Speedstack
- e. The main application status bar has been updated to include Target Stackup Thickness, Stackup Thickness and Stack Up Thickness with Solder Mask
- f. The print option now includes the Solder Mask Thickness and Stackup Thickness with Solder Mask calculations

5. Interfacing with other systems
  - a. Speedstack is now able to load an XML file on launch. If an XML file (.stkx) filename parameter is specified on the command line it will import this file into Speedstack
  - b. It is now possible to call an external program / utility / script from within Speedstack via the new External Utilities menu options. The menu items are configured within the Configuration option.
6. Multiple instances of Speedstack
  - a. It is now possible to start two or more instances of the Speedstack application. This is useful for stack up file comparisons and copying impedance structure parameters between stack up files.
7. Licensing
  - a. License change. Speedstack 2013 v1 3.03 requires a new FLEXIm license feature.
  - b. A new SPEEDSTACK\_IO license feature is used to secure the use of the Import / Export options.

### *Fixes*

1. The Hatch Copper Percentage field now stores correctly within the Configuration option.  
001-00-000362

## **Version 12.08**

### *Features*

1. UI: New Scrolling method by direct manipulation of the stack graphics
  - a. Mouse Wheel to zoom in and out
  - b. Default view is the maximum zoom achievable (100%)
  - c. clicking middle (wheel) button jumps view back to default view (100%) with the first layer shown (when no layer is selected, otherwise selected layer is shown)
  - d. clicking middle (wheel) button with CTRL held down, displays extents of the current stack
  - e. left button held down on the view will allow for the stack to be scrolled up and down
2. UI: Old Track/Scrollbar removed
3. UI: Ability to zoom out and view larger stacks in their entirety
4. UI: Red Indicator on layers that contain structures
5. UI: References to 'Flex' now removed from menu
6. UI: When Clicking 'New', a warning will appear that all data is about to be lost
7. Code: All references to VIEWER now gone. Viewer no longer exists.
8. Printing : Option to make grouping (by layer) of structures more obvious in CI table
9. Printing : Ability to hide Board Thickness and Arrow-line

### *Fixes*

1. UI: Disabled 'Remove Copper' for Foil types. 001-00-000266
2. UI: Fixed issue when adding structure, Advanced button is clicked, Reference Layer changed, but is wrong if structure type is changed. 001-00-000280
3. UI: Wizard Cancel button now working. 001-00-000261
4. UI: Skip Button now hidden when viewing File-Properties. 001-00-000277
5. Printing: Fixed problem where the Thickness line overshooting the extents of the stack. 001-00-000282
6. Printing: Fixed some drawing issues. 439-01-000267

## Version 12.05

### Features

1. HDI: Added functionality to the Navigator to improve support for HDI builds
2. HDI: New option to copy valid drills from Master stack.
3. HDI: Sequential Plan: Creates sub-stacks that represents each press cycle in a sequential lamination from Master stack based on foil locations
4. HDI: Drill Plan: Creates sub-stacks that represents each press cycle from Master stack based on drill start-end layers
5. HDI: Added the ability to create a sub-stack from the current stack selected rather than always creating a duplicate of the Master
6. HDI: Added the ability to copy / paste an existing stack
7. Error checking for unrealistic parameter values in VMM wizard
8. Added a cancel option when exiting Library
9. Display indication of whether user is in Material Library or VMM mode on main Editor screen
10. URL position changed to avoid clashing with long copyright notices in Printing.
11. Added the ability to import the stackup notes from an ascii file
12. Renamed Speedflex HDI module to Speedstack Flex / Speedstack HDI
13. Updated Configuration | Licensing tab
14. Updated splash screen

### Fixes

1. UI: Stop stack from scrolling to the bottom layer each time after changes are made
2. UI: Most recently added structure is now the one in focus when the structure wizard is closed (001-00-000212 & 001-00-000235)
4. Printing: Improved the way custom logo images are scaled
5. Printing: Fixed a problem where the dimension arrows are incorrect for large stacks that span multiple pages
6. Printing: Fixed blank pages being printed when all tables (stack, drills, impedance) are suppressed
7. Printing: Fixed a problem where changing print parameters does not force a refresh when using Win 7 64-bit.
8. File I/O: Fixed a problem where V1 2.01 does not open .stk files created in v11 .06 (001-00-000207)
9. UI: Fixed 'F4' toggle for Nav view not working if Navigator has focus
10. UI: Fixed problem where The 'View | Open Flex Nav' menu item checkbox does not reflect proper state when the Navigator is closed from the context menu
11. License agreement: Updated license agreement
12. Material library: Fixed tolerance field bug when Importing CSV for soldermask, ident and coverlay (001-00-000227)
13. VMM Sequential/HDI wizard: Fixed bug where Core | Lower Trace | Trace Inverted flag set incorrectly (001-00-000230)
14. UI: Fixed bug where highlighted selected structure not always appearing correctly
15. File I/O: Fixed bug where Stackup File Properties lost during export to XML. (438-01-000036)



## Version 12.01

### Features

1. Crosshatch support for Speedstack / Speedflex (XFE). Implements the same crosshatch calculation technique used in the Si8000m / Si9000e
2. Enhanced copy / paste structure exchange format (clipboard) to support hatch profile. Hatch Pitch, Hatch Width, Lower and
3. Upper Hatch Plane flags are now transferred between Si8000m / Si9000e and Speedstack
4. Apply Finishing tool bar icon now indicates that finishing has been applied
5. Introduce the ability to override the materials colours when printing stack up documents using the technical report
6. Improvements to the stack up dimension arrows on the technical report
7. Virtual Material Mode wizard dialog improved

### Fixes

1. Issue with Coplanar Strip 2B structures (without Ground)
2. Minor problem when adding structures with no target impedance
3. Undo / Redo now supports the addition of sub-stacks
4. Importing XML files without structure information sometimes caused an exception
5. Issue with Export / Import of XML files containing Flex Cores
6. Issue with Export / Import of Peelable library materials to CSV
7. Issue with Coverlays in old sci/stk files causing exceptions

## Version 11.06

### Features

#### Speedstack

1. Definable colours per material
  - a. Have the ability to set and store individual material colours, accessible from the material Properties dialog. When adding a material, the colour is set to the configuration defaults. Stacks loaded from previous Speedstack versions that do not contain colour information will be set to the configuration defaults. Printing will reflect the colour changes
2. Stack browser / search option
  - a. Utilise alternate data streams (ADS) to store summary stack information, including layer count, thickness, copper thickness etc. A search mechanism is provided to allow the user to specify a filter criteria and match the relevant files. On selecting the file it will automatically load it into the stack editor
3. Silver Paste support
  - a. Reuse the foil material to represent silver paste, displayed in silver colour

#### Speedflex HDI

1. Configurable sub-stack display order
  - a. The ability to re-arrange sub-stack order within Navigator now exists. This is useful for HDI builds
2. Internal Coverlays
  - a. Enhanced rules now allow impedance structures to be added when coverlays exist internally within stack. When a coverlay is beyond the outer copper it will behave like a coating, whereas when internal it will behave like a bondply / prepreg

3. Doublets
  - a. Support situations where two or more flexi cores are present with an air gap in between
4. Remove copper from sub-stacks
  - a. Support situations where copper is removed from one side of a core in the sub-stack. Eg. the core has both coppers enabled in the Master but one copper is etched away in the sub-stack.
5. Other Speedflex HDI Improvements
  - a. Now includes the ability to rename substacks
  - b. Sub-stack name now printed beneath each stack on technical print overview page

#### *Fixes*

1. Numerous fixes addressing known problems in previous version
2. Increased stability

## **Version 11.01**

#### *Features*

1. Improved Autostack algorithm
2. Improved Stack Re-Process Option
3. Simplified GUI for AutoStack
4. New style laser drilling
5. New fill types for drilling (None, Copper, Resin, Soldermask)
6. New Printing Features (Graphical additions, Drill table)
7. Additional Note fields for Impedance structures

#### *Fixes*

1. Fixed cause of exception when importing XML with no structures when Project with structures loaded Ticket(325-01 -000770)
2. Adding pre-pregs when in Simple Percentage Method now accepts Isolation Distance Settings Ticket 325-01-000775
3. Bug importing from XML Mixed Layers with Differential impedances which results in Coplanars is fixed Ticket 325-01-000771
4. Removed need to recalculate all structures on loading 409-01-000022
6. Fixed Undo/Redo problem with Flex substacks 439-01-000007
7. Fixed numerous reported/unreported bugs with AutoStack 325-01-000397, 325-01-000406, 325-01-000408, 325-01-000506, 325-01-000680, 325-01-000725
8. Fixed problem with finishing when switching Virtual Material Mode 325-01 -000897
9. Fixed problem with loss of structures when no Ground present 325-01-000896
10. Fixed exception when switching from AutoStack to Stack Editor when flex stack present 325-01-000889
11. Fixed exception when removing sub-stack from stacks containing SSCs 325-01-000860
12. 325-01-000808
13. 325-01-000819
14. Fixed problems with Single sided coppers 325-01-000831, 325-01-000853 and 325-01 - 000888
15. Fixed exception thrown under some circumstances when adding a letter to number boxes 325-01-000868
16. Fixed exception thrown when switching from AutoStack to Stack Editor when there are fewer structures in the previous Stack 325-01-000871

## Version 10.06

### Features

1. Speedstack Express
2. Different LayerTypes across sub-stacks, including no copper

### Fixes

1. Loss of amended data when changing structure parameters then Refreshing (325-01-000682)
2. On Leaving Flex Navigator Focus returns to frmStackUp (325-01-000633)
3. Stack Reprocess causes exception when no licence present(325-01-000664)
4. Incorrect Reference layers when Flexy Cores present(325-01-000665)
5. Mirrored structures not working correctly when FlexiCore present (325-01-000666)
6. Excess Resin now unit switching correctly (325-01-000675)
7. Layer type buttons now functioning correctly (409-01-000003)
8. Property form titles in correct(325-01-000655)
9. Problems with Single Sided and Double sided core swaps(325-01-000704)(325-01-000643)
10. Prevented the Enabling/Disabling of materials in Master Stack. Many bugs appear to originate in the disabling of materials in the Master stack (325-01-000608) (325-01-000630)(325-01-000631 )(325-01-000659)(325-01-000698)
11. Upper core having copper inverted when working in Symmetry(325-01-000722)
12. Improved performance of Default File Folder, When Opening a Stack/Project the Default folder is pointed to.
  - a. When Saving/Saving As a Stack/Project the source folder is pointed to. (325-01-000636)
13. Symmetry Check Not working (325-01-000738)
14. Prevent the removal or addition of Coppers while substacks present (325-01-000739)
15. Test the validity of stacks before doing a Rebuild (325-01-000740)
16. Fix problem with UndoRedo/ with Substacks present (325-01-000737)

## Version 10.01

### Features

1. New Speedflex licensed module offering rigid flex support
2. Additional flexible core, bondply and adhesive materials
3. Navigator view that provides an overview of the rigid flex assembly, offering options to add, remove and select sub-stacks
4. Printing enhanced to provide an rigid flex assembly overview, plus detailed reports for each sub-stack
5. Laser drilling rules enhanced to allow drills to span several layers, with an associated facility in Configuration Options to specify maximum laser drilled layers

### Fixes

1. Advanced structures now prevent the mis-specifying of plane layers
2. When using Autostack, if the Filters folder has been removed, or incorrectly set, an error could occur. This has now been resolved.
3. When using a single-sided core an error was reported when changing layer types. Fixed.
4. When selecting coated coplanar structure a calculation issue sometimes occurred, fixed
5. The Separation Region Dielectric (REr) parameter is now included in the XML export

## Version 9.04

### Features

1. Stack Editor. Option to change layer type from Signal or Plane to Mixed without removing structures.
2. Impedance Summary. Add a new tab alongside the Controlled Impedance option to produce a summary of impedance structure status. Provides an overview without having to examine all structures individually.
3. Material Library. Add option to sort columns. Add option to apply filters within library dialog
4. Copper Finishing. For Laser vias only apply copper finishing to the first electrical layer only.
5. Drilling. For mechanical drills remove "invalid drill" rules that prevent controlled depth drill passes from being added to stack. In summary, it should be possible to add a drill from an external to any internal layer
6. Autostack. Multiple algorithm enhancements
7. Configuration. Some legacy configuration fields exist for Print Technical Report A which should be removed to avoid confusion.
8. Tech report. PTH and NPTH mechanical drill holes look very similar on the print out. Change the printed appearance of the NPTH hole so that it is more obvious to the user.
9. Tech report has no indication on it that it came from Polar. Introduce a "strapline" that is always printed.

### Fixes

1. Auto-loading an ssd file that has been deleted allows user to access auto-generate. This can then cause the software to through an exception error.
2. When causing a design logic DRC error by moving solder mask down within stack a exception error is sometimes thrown when using Undo.
3. Material Library Import. The RCC sample file included in the C:\Program Files\Polar\Speedstack\Material Library Import\M M folder is invalid.
4. When using the Stack Wizard moving the mouse over the help icons causes the help tool tip to appear but they do not close
5. Autostack. Resolve issue identified with broadside structures
6. Reprocess stack sometimes causes solder mask to disappear when using Edit - Sequential/HDI option.
8. Overcome form multilingual problems that sometimes occur within the AutoStack feature.
9. Tolerance truncation problem. Within the library it is possible to enter a tolerance as a decimal, but when it is placed into the stack it is truncated to an integer.
10. Remove tolerance field from non-dielectric materials.

## Version 9.01.01

### Features

1. Coplanars now permissible on Mixed layers
2. Job file import now remembers the definitions
3. Increased graphics precision
4. Warning message when clearing library
5. Impedance structures ordered for printing

### Fixes

1. Fixed Lock up state when impossible rules/materials included.
2. Fixed Infinity thickness in coverlay graphics
3. Fixed zero Tolerance in Properties (again)
4. Fixed exception when deleting current constraint

## Version 9.01

### *Features*

1. Partial Stack Definition in AutoGen
2. Rules for Dielectrics
3. Laser Drill Rules
4. Stack Padding to achieve overall board thickness
5. "Mouse Over" stack wizard help
6. Drill validation checks
7. Preferred core can now be switched off

### *Fixes*

1. Numbering of layers on stack review screen now correct
2. Unbalanced coppers now detected in DRC checks
3. Exception no longer caused when trying to launch with deleted ssd file
4. Unit switching for drill sizes now correct
5. Tolerance now visible in Properties
6. Exception when loading old libraries now fixed

## Version 3.25

### *Features*

1. UCAM .Job Import
2. Convert 2 Foils to a Core
3. Symmetrical Add Drill
4. Symmetrical Move Material
5. Symmetrical Delete
6. Increase Resolution of tolerances
7. Printing – New data column 'Processed Thickness'
8. Printing – Impedance table columns now customisable
9. Printing – New look Laser drills
10. Printing – 'Trace 1 In Layer' renamed to 'Impedance Signal Layer' (to avoid confusion)
11. Printing – 'Trace 2 In Layer' renamed to 'Broadside 2nd Layer' (to avoid confusion)
12. Printing – Thickness data beside the stack image can now toggle between Actual and Target

### *Fixes*

1. Exception Thrown when installing project on some continental machines
2. Unit switching being carried out on Upper copper coverage in Selected items information
3. Filtering option with Swap material
4. Comma related problem with Czech Windows
5. Copper coverage percentage on upper copper seems to unit switch
6. Printing – problem with the thickness data & line (beside the stack image resolved for stacks with non-copper core or single-sided cores)

## Version 3.2

### *Features*

1. All Structures available on Mixed layers
2. Unit Switching
3. Undo/Redo
4. Add Drills to Auto-generate files.
5. Extend dielectric constant threshold.
6. Export Material Library to CSV
7. Export To Coupon Generator

### *Fixes*

1. Autogenerate will now accept copper with 0 weight present in Library
2. Update Er when default value changed
3. Highlighting copper types required to make changing of copper types possible
4. Improve final finished height when Auto generating
5. Defaults disabled in Defaults screen once stack initialised
6. Prevent exception thrown when in Structure wizard
7. Make tolerances more intuitive in Autostack
8. Si9000e License now being "formally" released
9. Prevent exception being thrown when importing a stack with no structures

## **Version 3.0**

### *Features*

1. Add/Swap Non-copper cores
2. Re-engineer existing stacks
3. New auto-generate GUI
4. Add Drills to Auto-generate files.
5. Automatic adjustment of impedance and or trace width when goal-seeking to increase the chances of achieving a working stack.
6. One-click selection of material for use in auto-generate by means of filters
7. HDI and Sequentially laminated stacks now catered for.
8. Removed Soldermask from Thickness calculations

### *Fixes*

1. Highlighted Errors reset when scrolling through Structures
2. Board thickness error reset when board thickness changes or when DRC switched off
3. When manually building a stack an exception error occurred whilst adding materials
4. When Excess Resin check selected warning about requiring Excess Resin Fields to be populated occurs when launching app
5. When symmetrical mode is turned on and editing the copper coverage say on a core, the copper coverage of the corresponding symmetrical layer is automatically set to 0. However, it should ideally be set to the same value or left untouched.
6. Max and min impedance values are reversed on some dialogues
7. Column selection dialog found in materials library and Printing B

## **Version 2.2**

### *Fixes*

1. Possibility of adding a broadside structure to a layer that does not contain a core pair.
2. Separation incorrectly spelled.
3. Column selection dialog; when 'Down' button is pressed with no selection made – exception is caused.
4. Minimum Allowable Hole Size calculation does not take into account the copper thickness of the exit layer.
5. Symmetry makes some auto-generated builds impossible these were not being handled.
6. Changing default thickness does not take effect until after closing and restarting Application

## Version 2.1.2

### *Fixes*

1. Cores with copper etched off not showing up in print.

## Version 2.1.1

### *Minor Fixes*

1. Inability to Load .ssd files without soldermasks
2. Problem with core only H1 values where there is more than 1 core for embedded structures
3. Prevent continued Goalseeking when Auto-generate already failed
4. Ensure Max and Min values correctly displayed in Summary form
5. Issues with saving project files

## Version 2.1

### *Minor Fixes*

1. Editing exception fixed

## Version 2.0

### *Features*

1. Ability to auto generate stacks with no dielectric height information
2. New material library field for cores: Plane on Both Sides

### *Minor Fixes*

1. When using the mirror function, the extra note fields are now copied correctly
2. Missing drills from Report B printout missing when layers are mixed
3. Report B printout footer readjusted
4. Report B printout now displays a page total
5. Report B printout thickness data repositioned

## Version 1.5

### *Features*

1. New material fields/properties added:
  - a. Cost
  - b. Lead Time
  - c. 5 x Notes
  - d. Panel Size
2. New Stack fields/properties added:
  - a. 4 x Revision slots
    - i. Revision
    - ii. Modification
    - iii. Date
    - iv. Editor
3. Updated CSV Export
4. Updated XML Export
5. Updated Materials Library Import
6. New, customisable print output

### *Minor Fixes*

1. Impossible build is now flagged when plating copper, finishing resulting in a negative value for isolation distance
2. Shortcut key CTRL+SHIFT+B bug fixed
3. Add CI Structure in the main menu bug fixed
4. Switching copper core planes to mixed exception fixed

## **Version 1.1**

### *Features*

1. New algorithms to allow more emphasis on cost than accuracy of the builds
  - a. Library templates allow for Cost, Lead-time etc.
  - b. Visual tweaks
  - c. Controlled Impedance information now added to XML outputs

### *Minor Fixes*

1. Symmetry bugs fixed
2. Persistent DRC via error bug when DRC is turned off fixed
3. Mixed units bug fixed
4. Printing showing different isolation distance than to what is on screen fixed
5. Saving ssd file issue fixed
6. Export issues fixed
7. Missing Cl. Indices from print-out fixed

## **Version 1.0 Release**