Speedstack 2021 Preview

Richard Attrill – May 2021 (Rev 3)
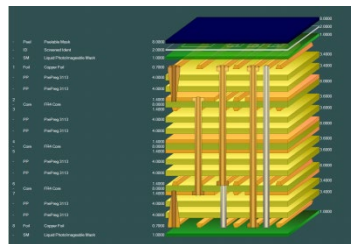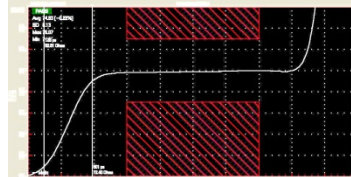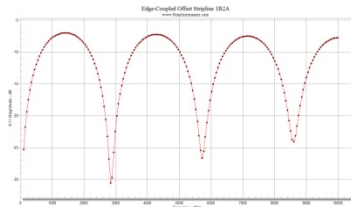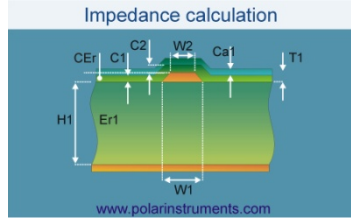
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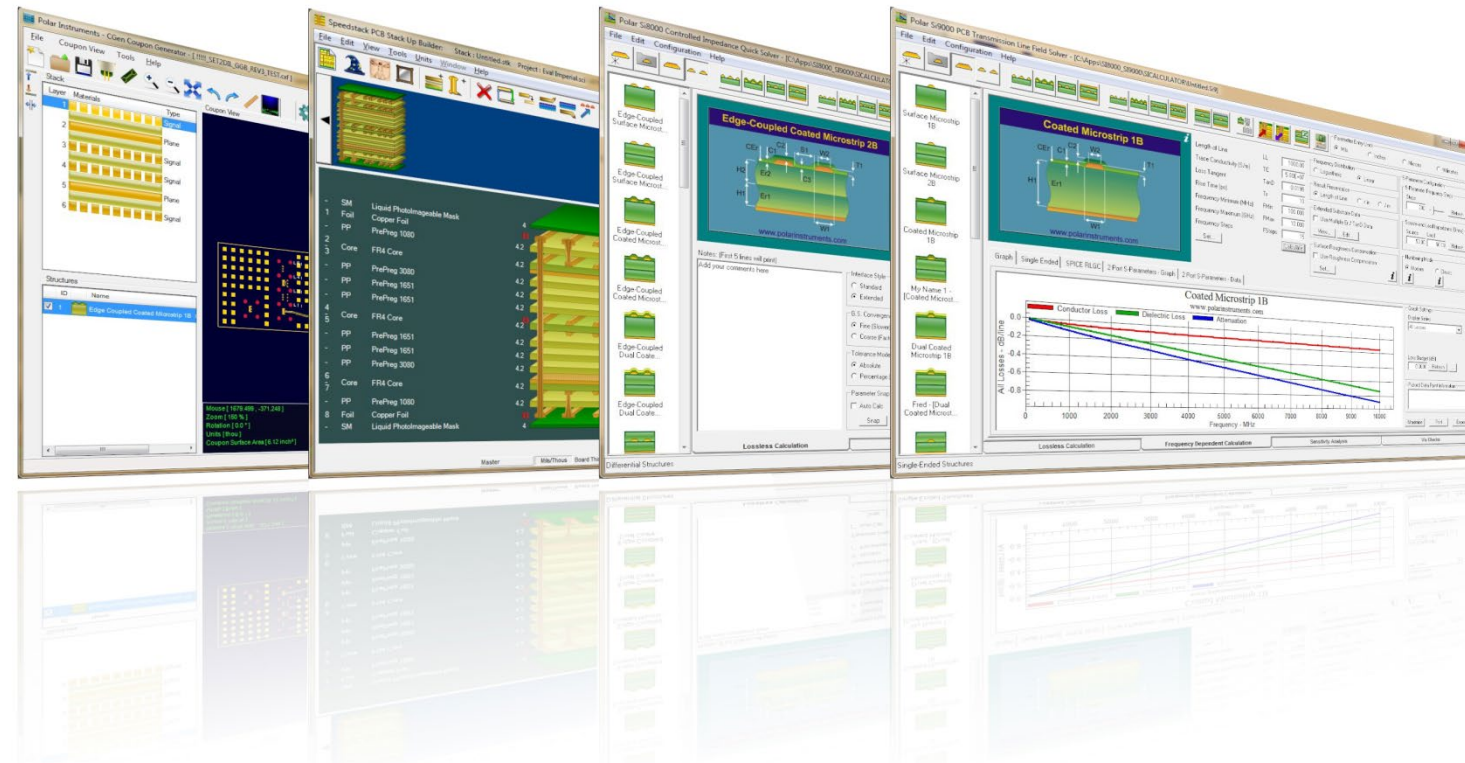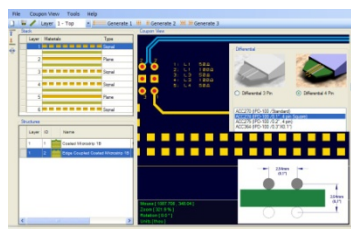
Introducing Speedstack 2021

Welcome to a preview of Speedstack 2021.

We have introduced a number of new features that have been requested through our Polarcare software maintenance service.

If you would like to have a web-based demonstration please contact your local Polar office, details are shown on the last slide of this presentation.

Please note: the Speedstack units have been set to Mils in the following screen grabs

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Speedstack v21.05.06 (May 2021)

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New Layer Name property for electrical / copper layers

A new Layer Name property has been introduced to the electrical / copper layer element of 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 descriptions to match existing layer naming conventions

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New Layer Name property for electrical / copper layers

Foil Properties

The new Layer Name property exists on all materials with an electrical / copper layer. The user can key in any alphanumeric name

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New Layer Name property for electrical / copper layers

Core Properties

For core materials, a new Layer Name property has been added for both upper and lower electrical / copper layers

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New Layer Name property for electrical / copper layers

The Selected Item Information auto updates as you click each material, the Layer Name can be confirmed here

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New Layer Name property for electrical / copper layers

-	SM	Liquid PhotoImageable Mask	4.000/0.0195	1.0000
1	Foil	Copper Foil		1.4000
-	PP	PrePreg 1080	4.200/0.0195	1.9500

L 1 [Top] : 2 Structures

-	PP	PrePreg 1651	4.200/0.0195	5.5520
4				1.4000
-	Core	FR4 Core	4.200/0.0195	12.0000
5				1.4000
-	PP	PrePreg 1651	4.200/0.0195	5.5520

L 5 [Inner 5]
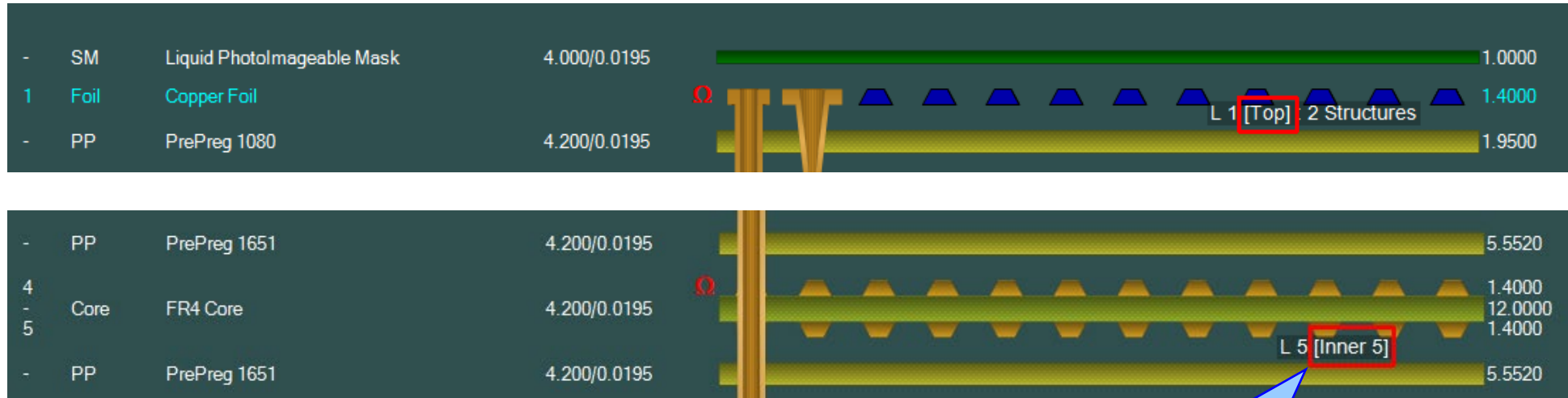
Mouse over the electrical layer and the Layer Name will display alongside the layer number and the amount of structures. Very quickly confirm the Layer Name without needing to open the Properties dialog

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New Layer Name property for electrical / copper layers

Customise the Display Fields to show the layer name next to the stack up graphic

New Layer Name property for electrical / copper layers

The technical report has also been updated to support layer names

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Copper Finishing classes increased

User selectable plating thicknesses under Finishing Options (Copper Coverage & Simple % methods)
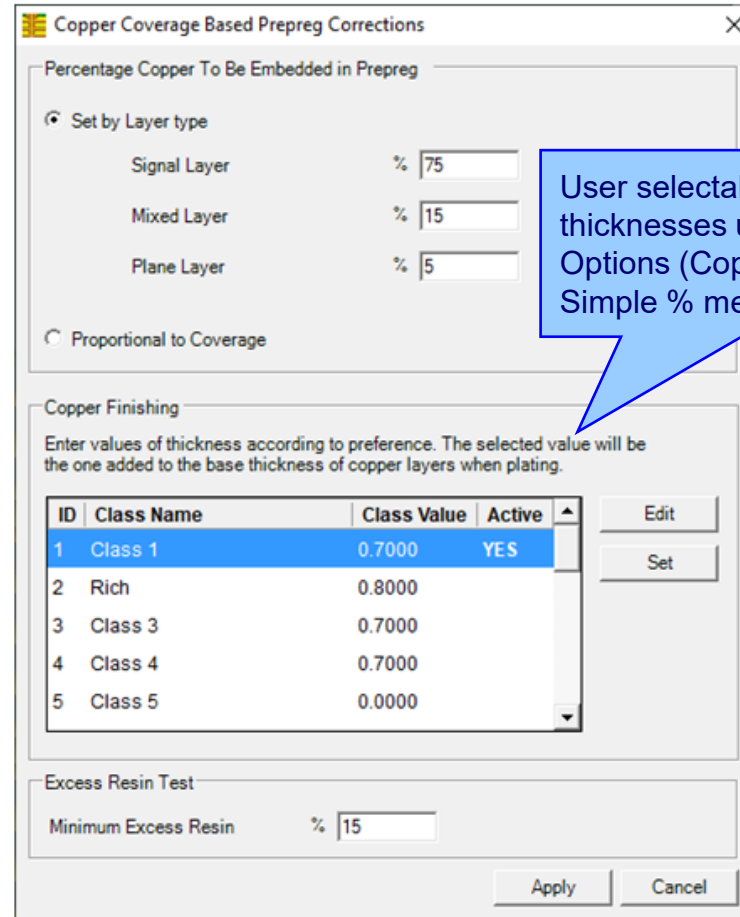
Speedstack v21.04 and earlier supported 4 classes

Speedstack v21.05 now supports 20 classes

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Import / Export enhancements

The following Import / Export options have been updated to support the layer name property introduced with Speedstack v21.05.06:

- XML STKX v21.00 and SSX v11.00 import / export options

- CSV export option

- Gerber / DXF export option

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Speedstack v21.04.00 (April 2021)

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All Losses plot - clearer labelling
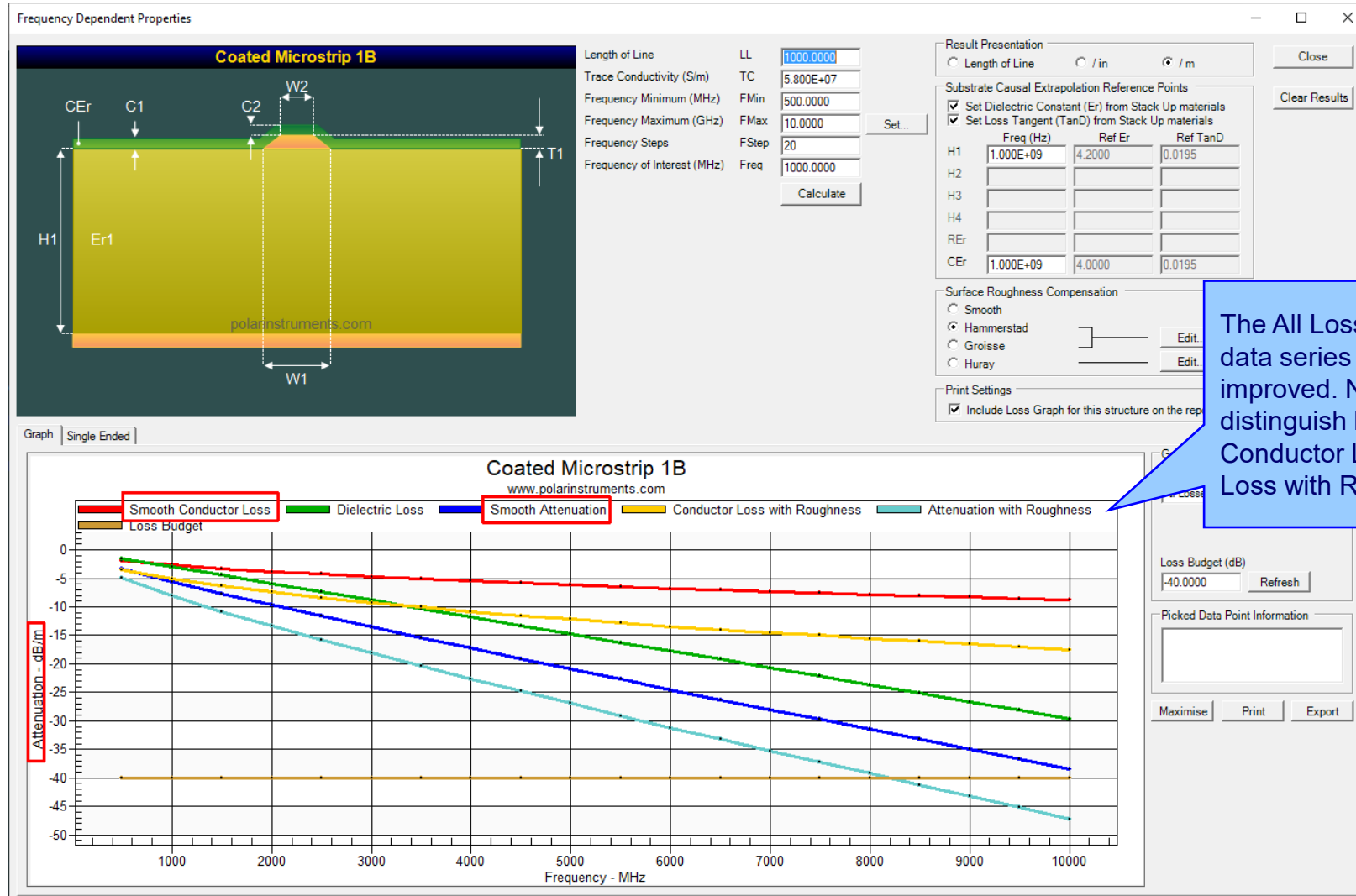
The All Losses plot y-axis and data series labelling has been improved. Now easier to distinguish between Smooth Conductor Loss and Conductor Loss with Roughness

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Other enhancements

- The controlled impedance and insertion loss Calculation Engine updated to the latest edition

- Frequency Dependent Calculations graphing library enhancements

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Speedstack v21.03.09 (March 2021)

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New Apply Plating Colours toolbar option

New Apply Plating Colours toolbar option.
Toggle between standard and enhanced colours

Automatically assign different colours to plated and un-plated copper layers.

Plated layers are determined by checking the copper base and finished thickness. Plated layers are shown as a darker colour

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New Apply Plating Colours toolbar option
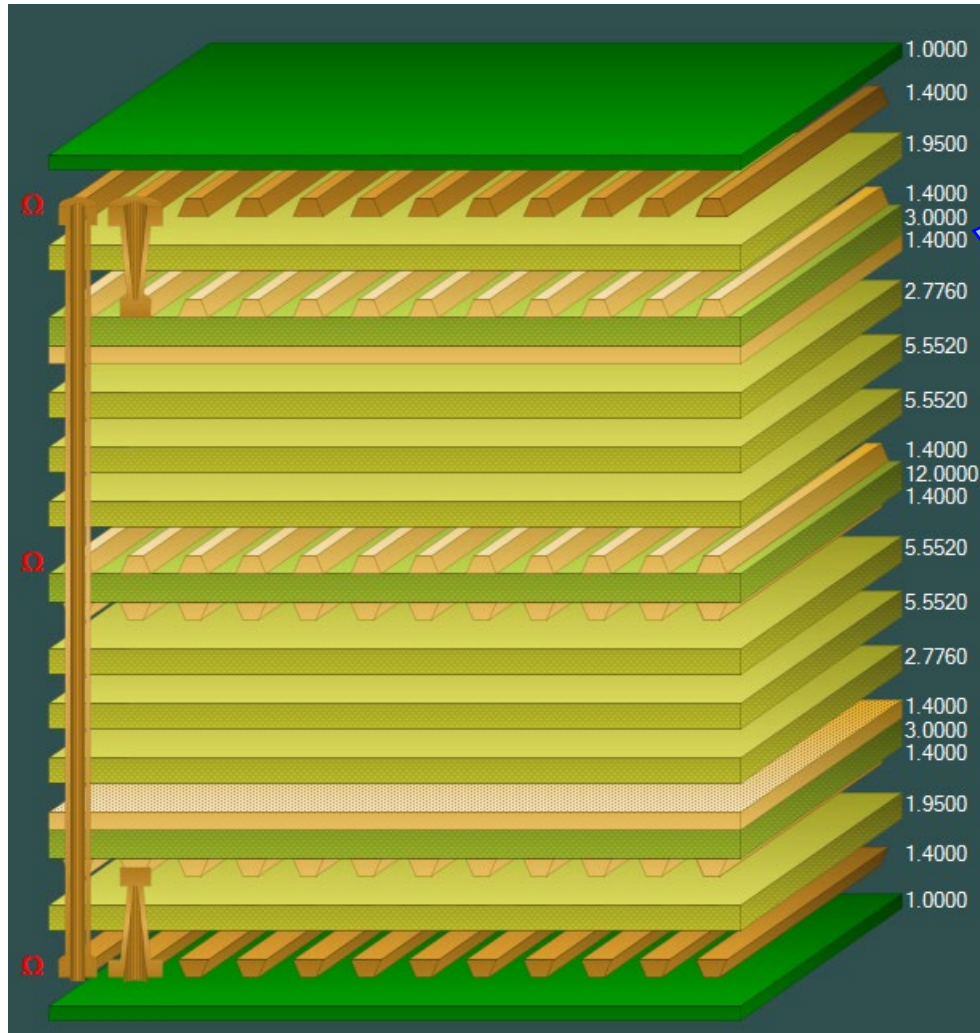
Plated Copper Layers

During PCB fabrication drill holes commonly have copper applied to the barrel wall by an electroplating process. This provides an interconnect between copper layers in the stack up.

This electroplating process often results in additional copper also being applied to the exposed copper layers where the mechanical drill starts / ends.
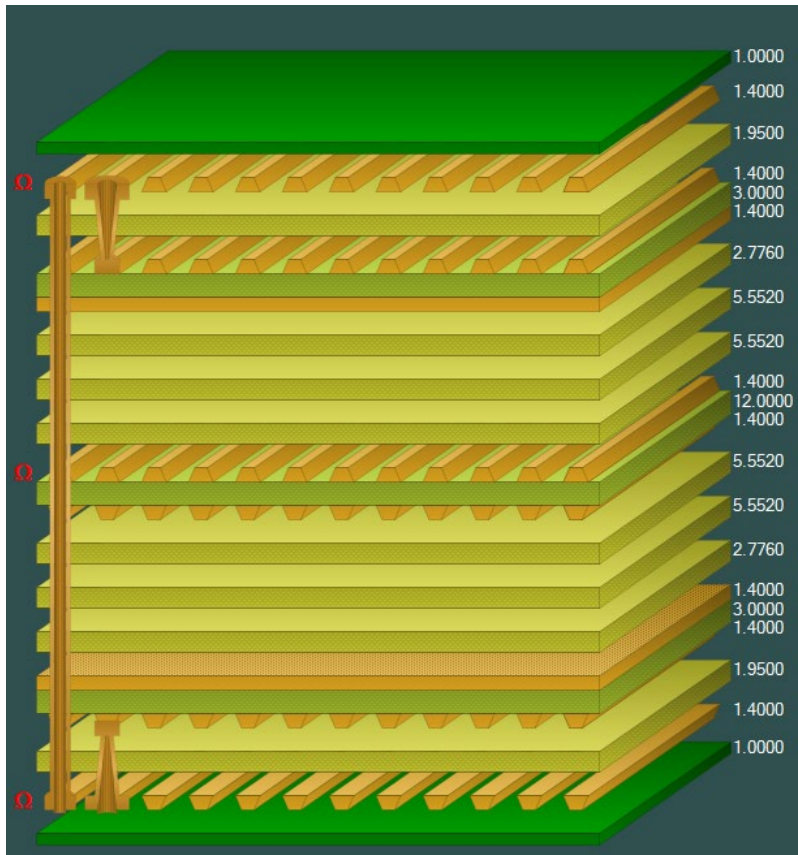
It is important to account for this additional plated copper thickness when calculating the overall stack up thickness and controlled impedance / insertion loss structures.

Speedstack has always allowed this additional plating thickness to be applied to the relevant copper layers. With v21.03 this has been enhanced further with automatic colour assignments to the plated and un-plated layers
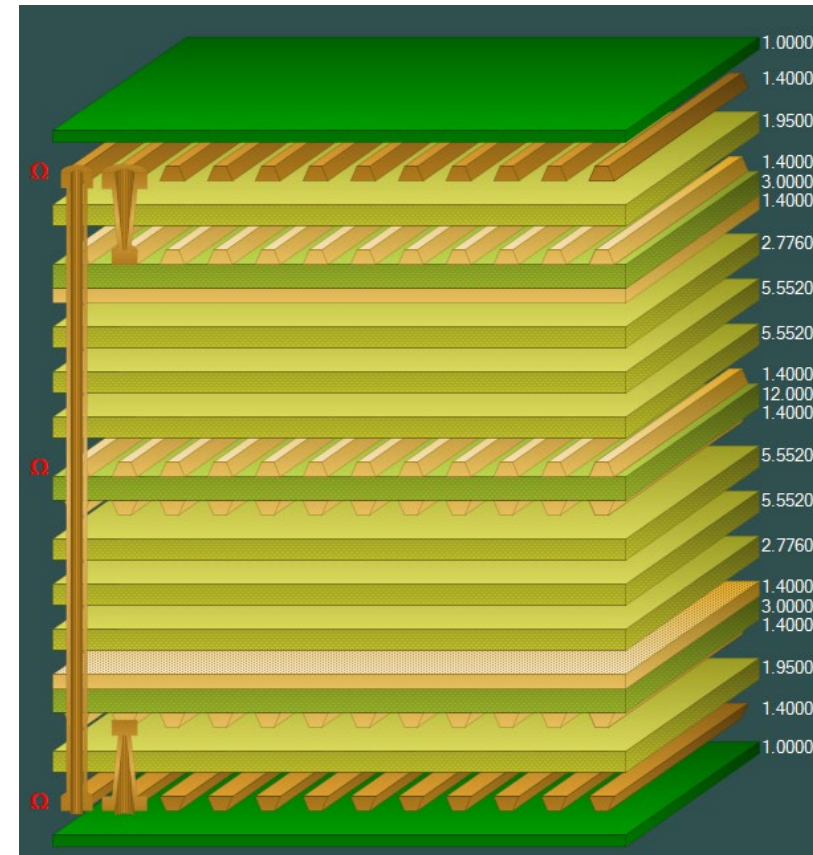
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New Apply Plating Colours toolbar option

Standard Colours

Apply Plating Colours

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New Apply Plating Colours toolbar option

The technical report will also show the plated and un-plated copper layers.

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New Apply Plating Colours toolbar option
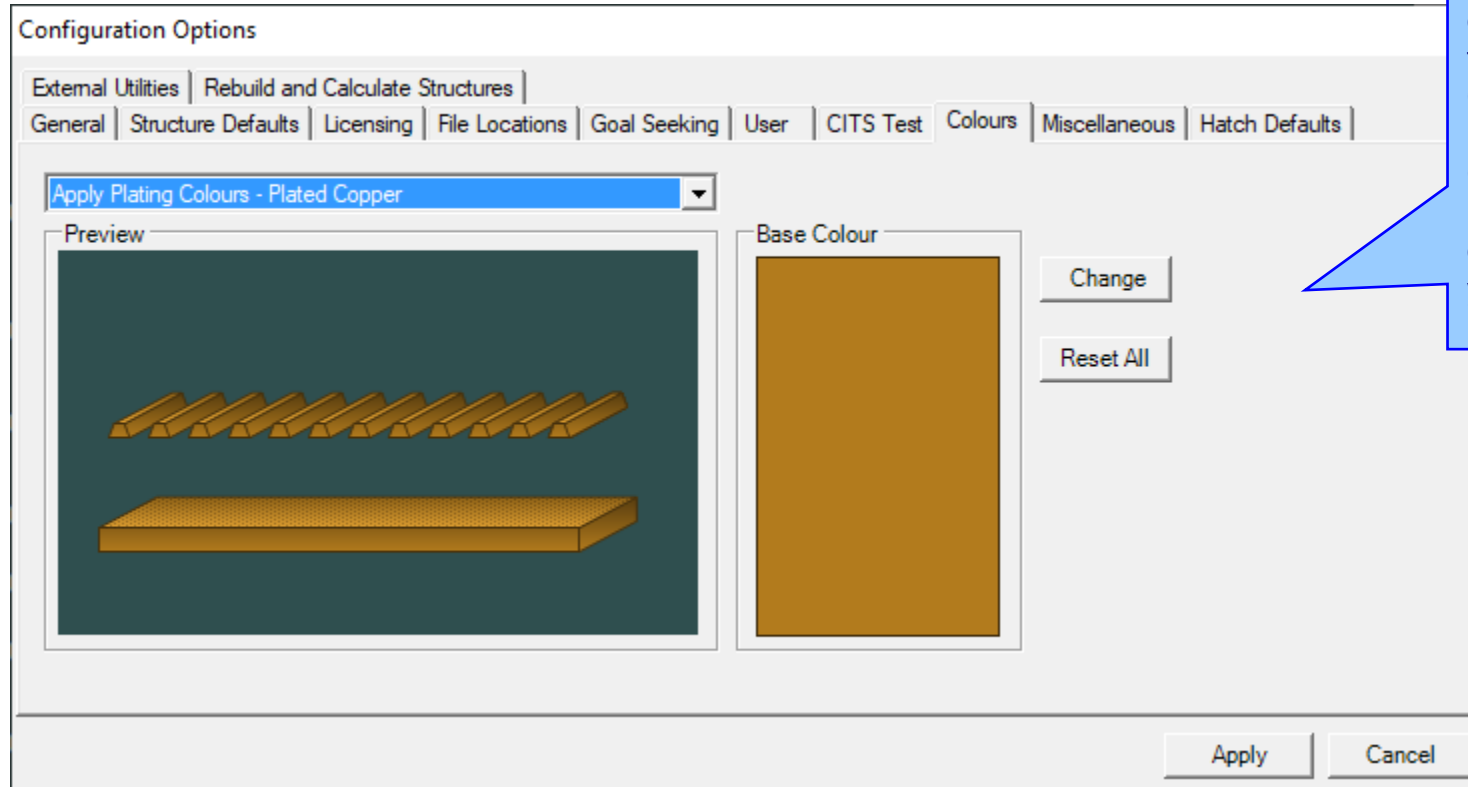
Two new user-definable colours have been introduced to the Speedstack Configuration Options.

Customise the Plated and Un-plated colours to suit existing colour schemes adopted by your organisation

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Online Library enhancements

Filter downloadable libraries by frequency. The frequency of the dielectric constant (Er) / loss tangent (TanD) material properties

Showa Denko and Tatsuta have recently joined the Polar Material Partner program

Improvements to On-Premise Mode to help users where, for security reasons, no Internet connection is available

Speedstack v21.02.01 (February 2021)

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New Shield material

Speedstack v21.02 introduces support for a new Shield material type.

Shield materials are used to prevent electromagnetic interference (EMI) from being either absorbed or radiated.

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New Shield material

Shields are typically applied to the outer layer(s) of the stack up
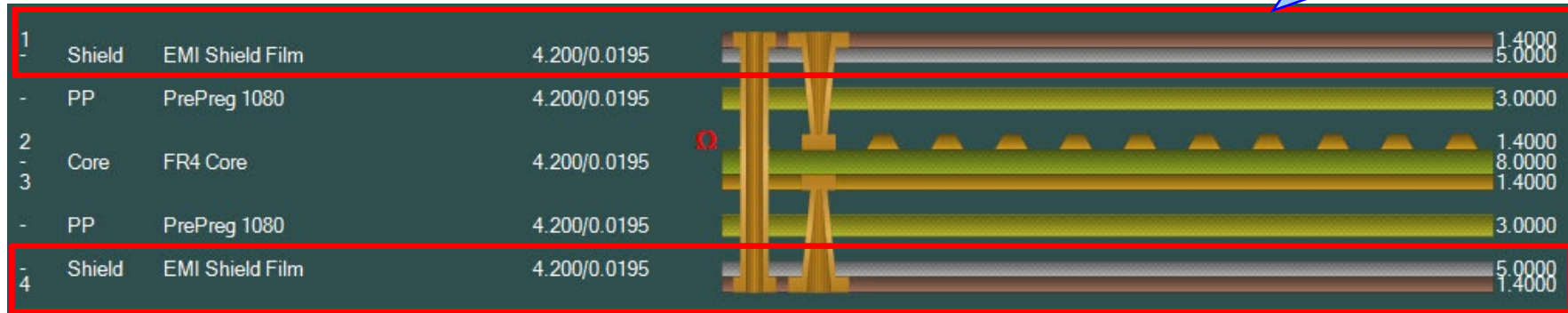
They consist of a shield layer (brown) and dielectric adhesive (silver)
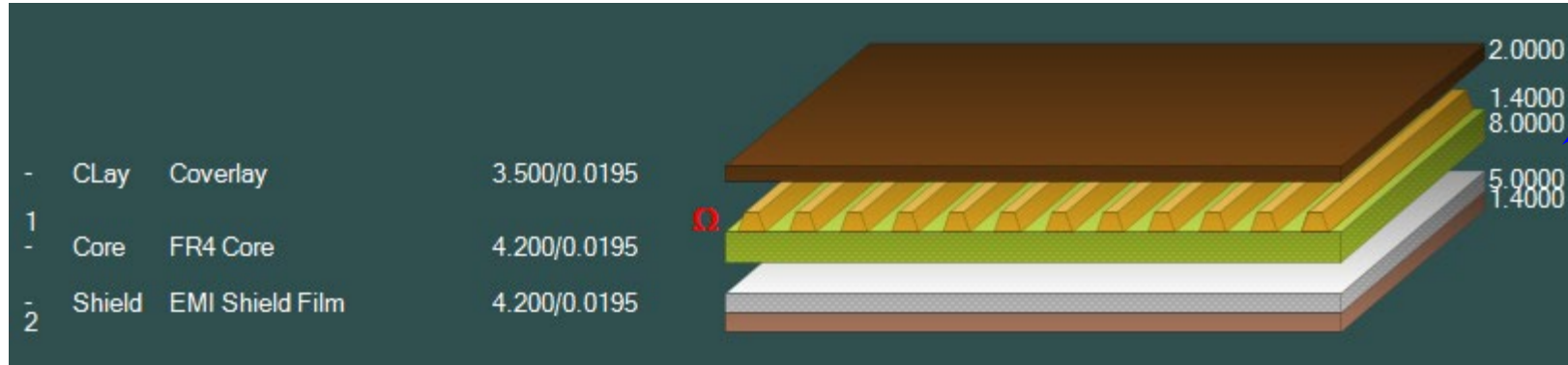
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Shield material examples

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Shield material examples

1 -	Shield	EMI Shield Film	4.200/0.0195
-	PP	PrePreg 1080	4.200/0.0195
2 - 3	Core	FR4 Core	4.200/0.0195
-	PP	PrePreg 1080	4.200/0.0195
4	Shield	EMI Shield Film	4.200/0.0195

Example #3
Double-sided core with two signal trace layers with shield above and below trace layers

1.4000
5.0000
3.0000
1.4000
3.0000
1.4000
3.0000
5.0000
1.4000

1 -	Shield	EMI Shield Film	4.200/0.0195
-	PP	PrePreg 1080	4.200/0.0195
2 - 3	Core	FR4 Core	4.200/0.0195
-	PP	PrePreg 1080	4.200/0.0195
4	Shield	EMI Shield Film	4.200/0.0195

Example #4
Double-sided core with one signal trace layer with shield above and below trace layers

1.4000
5.0000
3.0000
1.4000
8.0000
1.4000
3.0000
5.0000
1.4000

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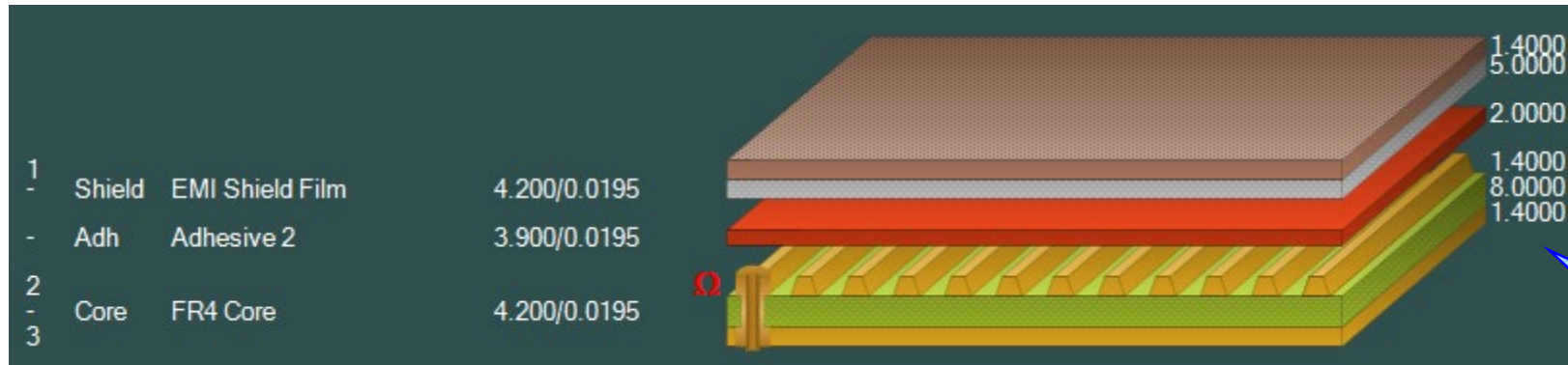
Material library enhancements

New Shields tab contains Shield material information

C:\Apps\Samples\Speedstack Imperial.mlbx

Foils | Prepregs | RCCs | Cores | Solder Masks | Ident Inks | Peelable Masks | Coverlays | Bond Ply | Adhesive | Flexible Cores | **Shields**

Supplier	Supplier Description	Description	Stock Number	Dielectric Base Thickness	Dielectric Finished Thickne	Shield Cu Thickness	Dielectric
Polar Samples	SH/001	EMI Shield Film	1200-001	5	5	0.7	4.2
Polar Samples	SH/002	EMI Shield Film	1200-002	5	5	1.4	4.2
Polar Samples	SH/003	EMI Shield Film	1200-003	5	5	2.8	4.2
Polar Samples	SH/004	EMI Shield Film	1200-004	10	10	0.7	4.2
Polar Samples	SH/005	EMI Shield Film	1200-005	10	10	1.4	4.2
Polar Samples	SH/006	EMI Shield Film	1200-006	10	10	2.8	4.2

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Material library enhancements

Material library Edit Shield dialog

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Online Library enhanced to support Shield materials

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Export / Import Shield library to Excel
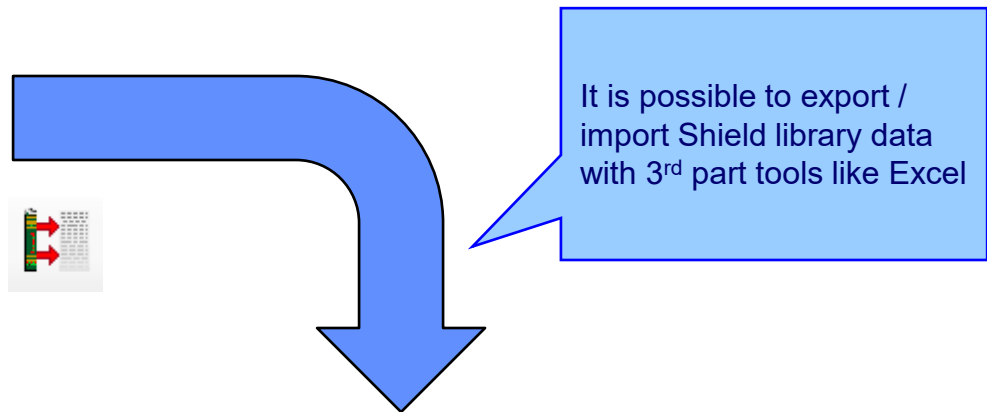
It is possible to export / import Shield library data with 3rd part tools like Excel

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Stack up editor enhancements
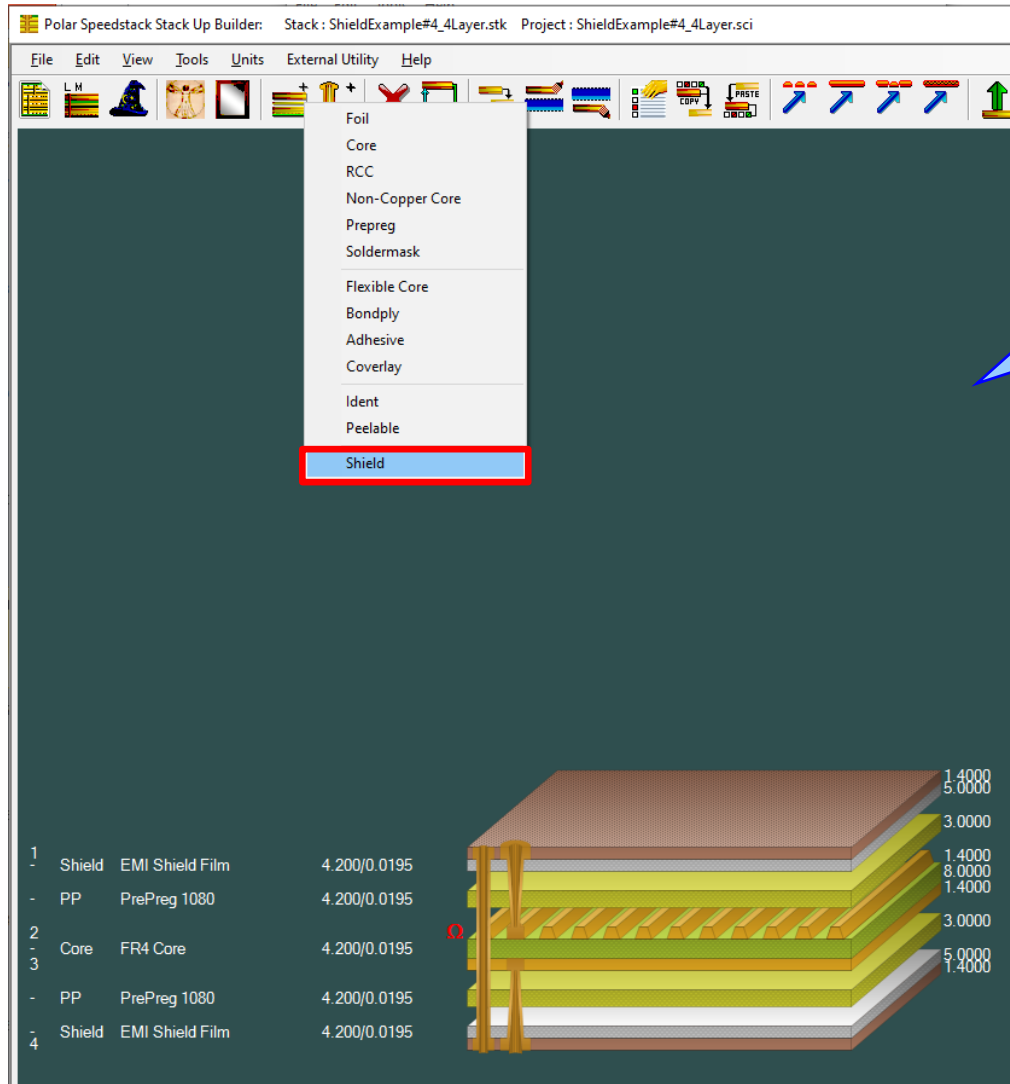
Stack Up editor enhancements:

Shield material options to add, delete, swap, move up, move down, symmetry and set properties

Shield properties

View and customise the Shield properties. Useful in 'what-if' scenarios

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Controlled impedance and insertion loss calculations

Impedance and insertion calculations support the new Shield material type.

Shield material region of structure.

Shield material in stack up

Shield adhesive height / thickness dimension and dielectric constant.

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Controlled impedance and insertion loss calculations

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Controlled impedance and insertion loss calculations

Please note: Speedstack is capable of supporting many shield types for stack up design and documentation. However, it is important to use the correct type of shield material for controlled impedance and insertion loss applications. They are often designated by the shield vendor as 'for high speed signal transmission applications'.

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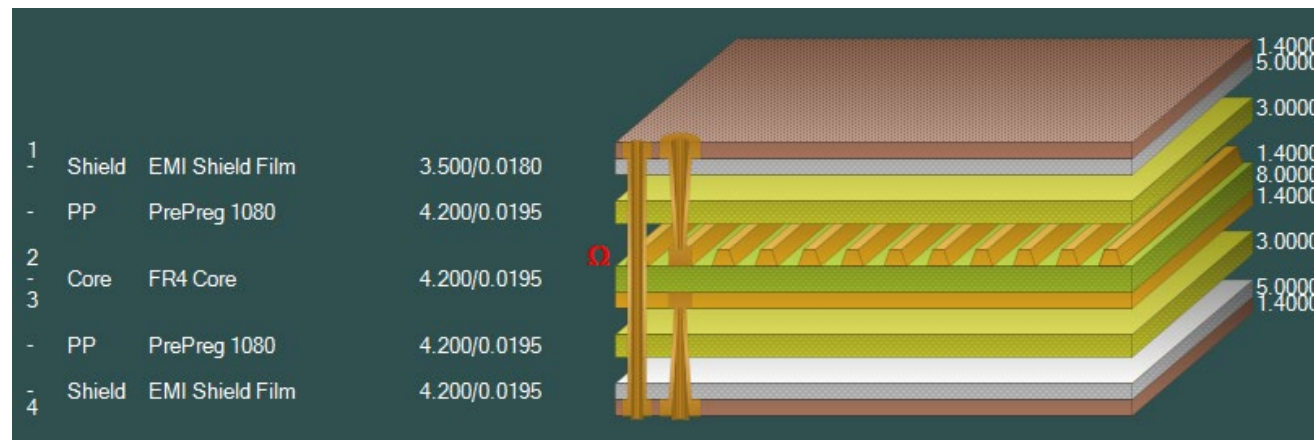
Technical report enhancements

Technical report showing shield materials

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Technical report enhancements

Insertion loss report supporting shield materials
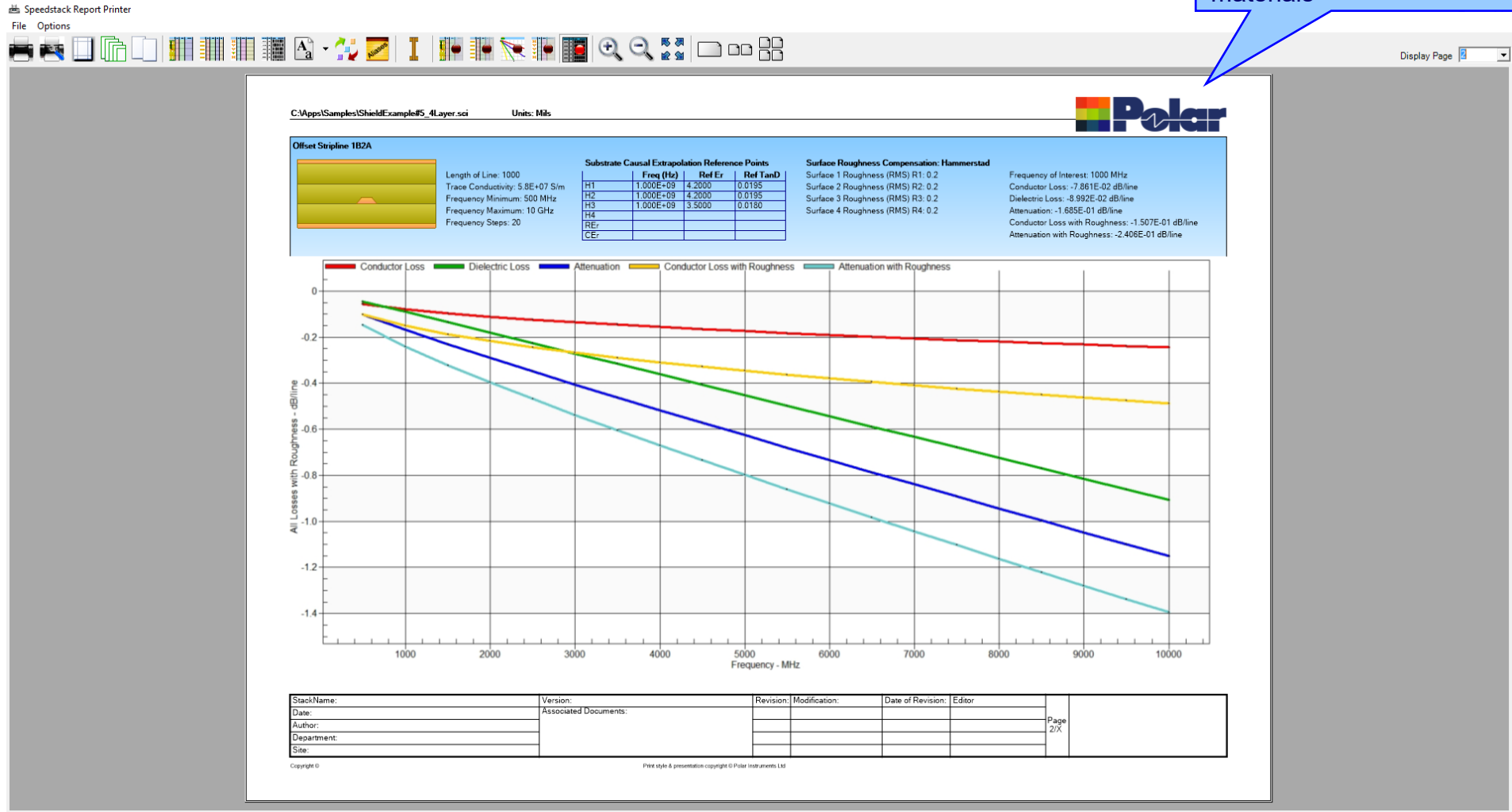
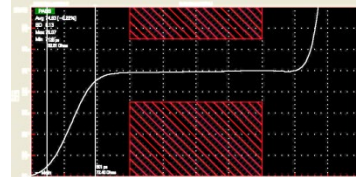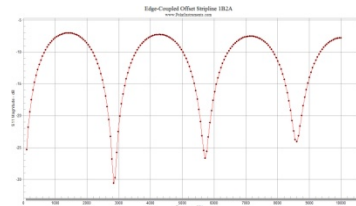Copyright © Polar Instruments 2021

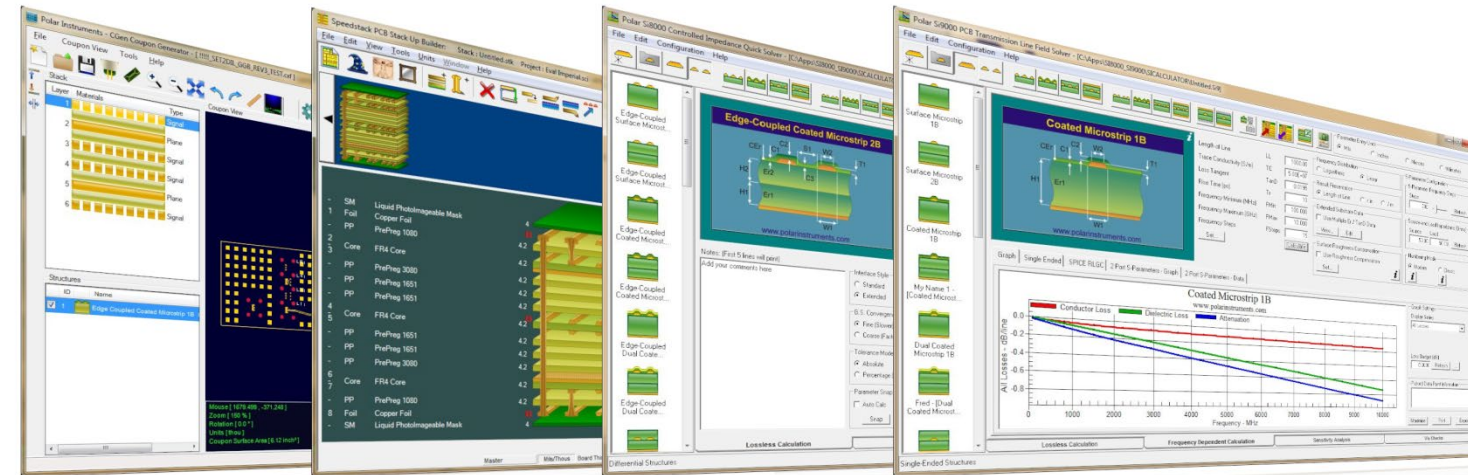**polar**instruments.com

Import / Export enhancements

The following Import / Export options have been updated to support the new shield material introduced with Speedstack 2021:
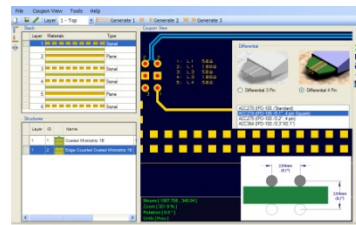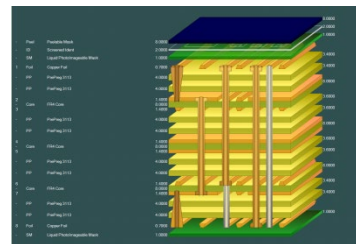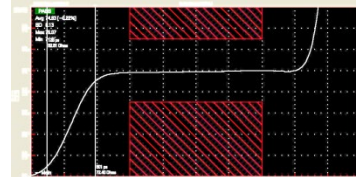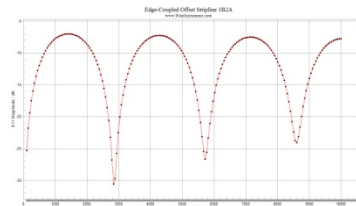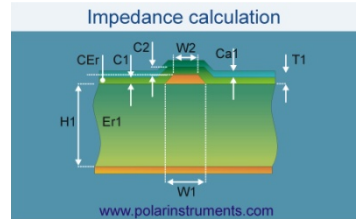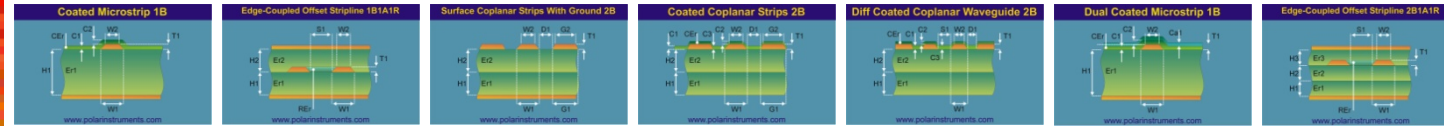
- XML STKX v20.00 and SSX v10.00 import / export options

- CSV export option

- Gerber / DXF export option

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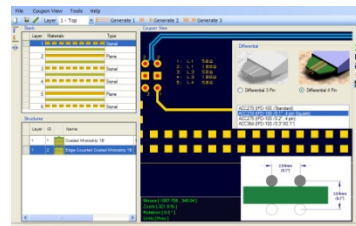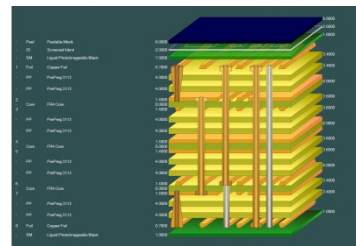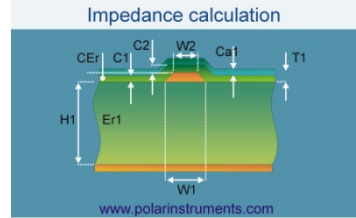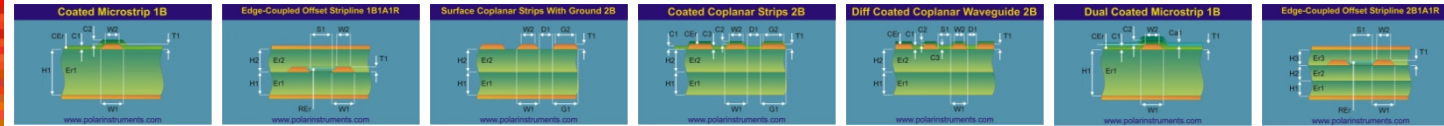
Thank you for viewing this Speedstack 2021 preview. If you have questions we would be delighted to help you. Your local contact information is contained on the following slide

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For more information:

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