

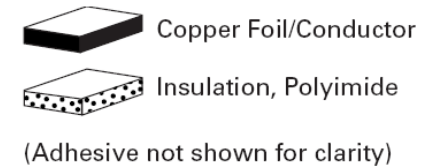
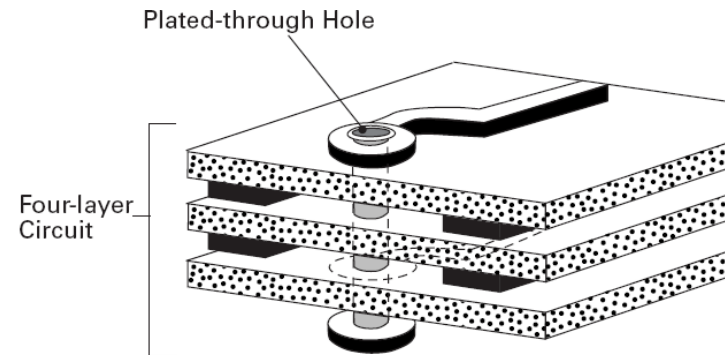
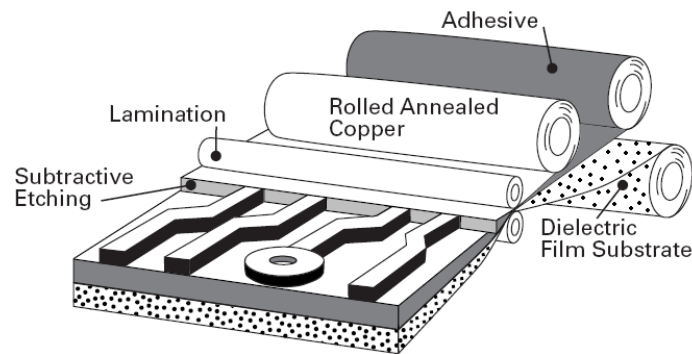
DownStream
T e c h n o l o g i e s

CAM350 14.5 / BluePrint 6.5 업데이트 내역

- CAM350 14.5 & BluePrint 6.5 신기능
 - Focus on Support of Rigid-Flex and Embedded Parts Design Data
 - Secondary Focus on Support of PCB Cores
 - Primarily sourced from IPC-2581 and ODB++ Imports
 - Cadence Allegro, Mentor Xpedition and Zuken CR8000
 - CAM350 14.5 offers features to create/modify content and Export
 - BluePrint 6.5 offers custom Rigid-Flex documentation features
 - Stackup Visualizer offers updates to support Rigid-Flex and Cores
 - Enhanced 3D Viewing of Rigid-Flex designs
 - Oh...and don't forget updated Backdrill Template and via in pad DFM

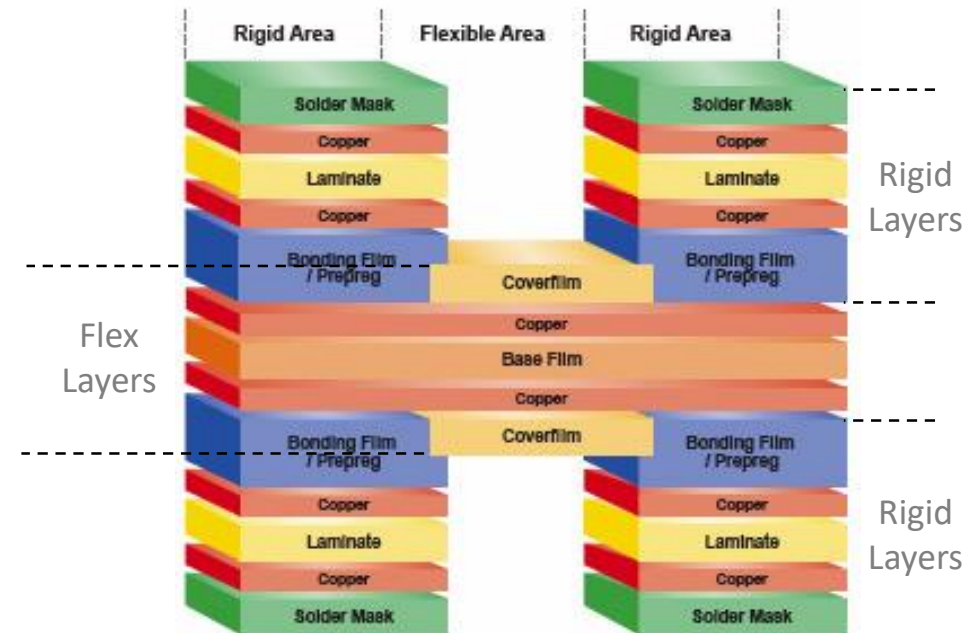
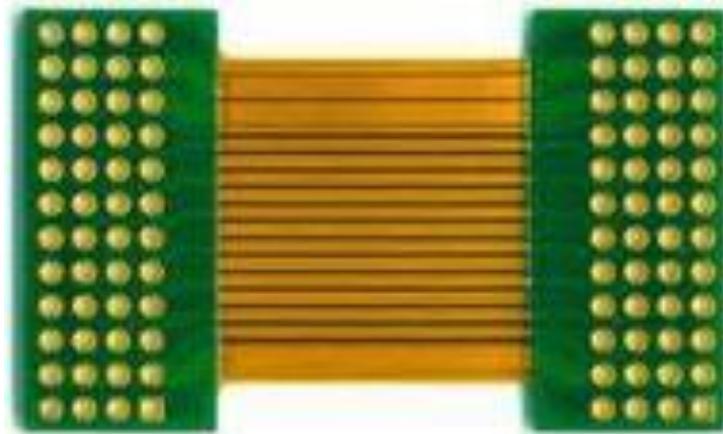
- **What is a Flexible PCB?**

- One to many layer PCB design with thin flexible (polyimide) substrates rather than thicker rigid (fiberglass) substrates



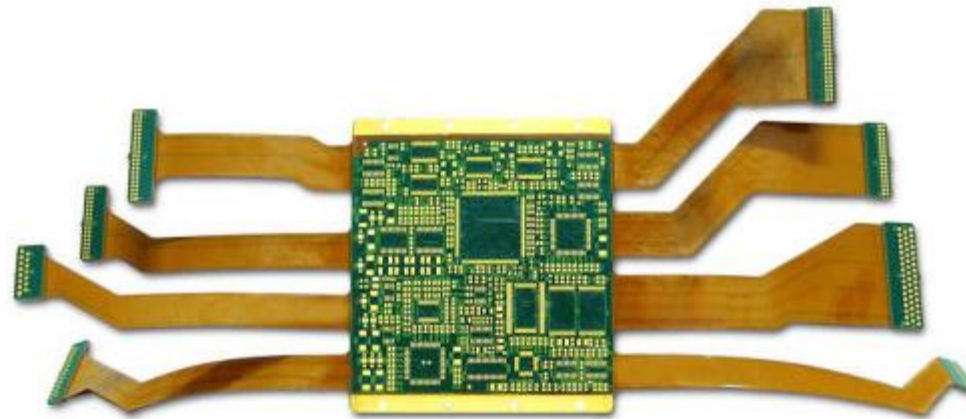
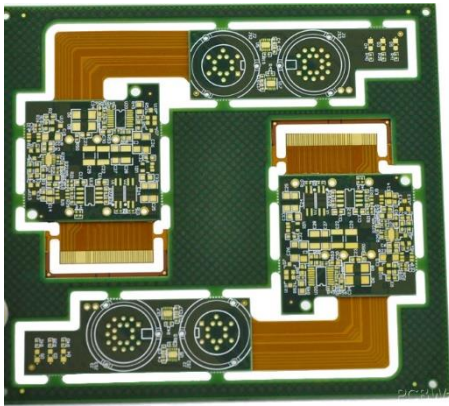
- What is Rigid-Flex PCB?

- A combination of both flexible and rigid PCB substrates
- Generally, one or more flexible cores sandwiched between rigid PCB material
- Rigid material may be used as a stiffener (void of any copper)

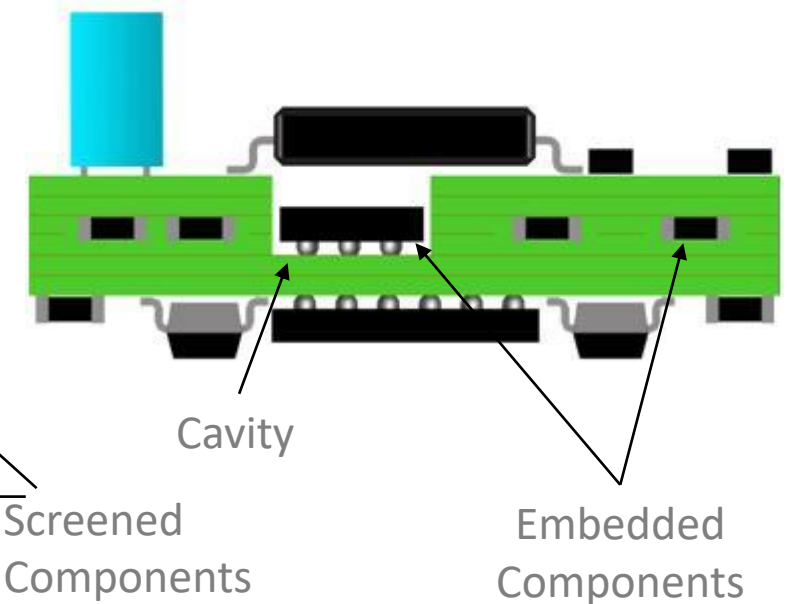
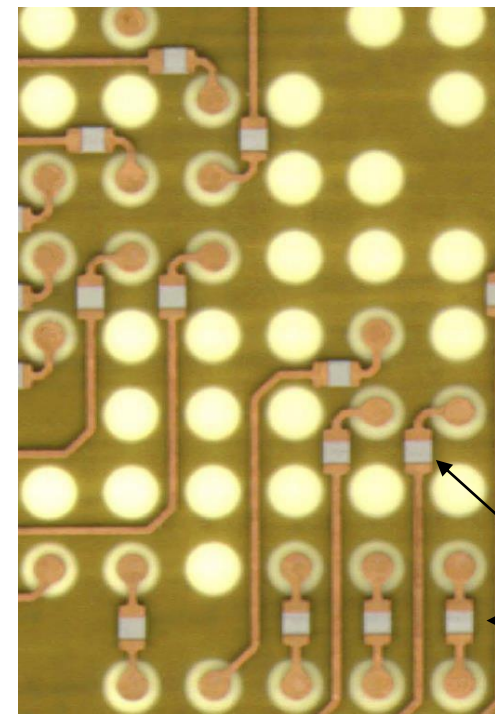
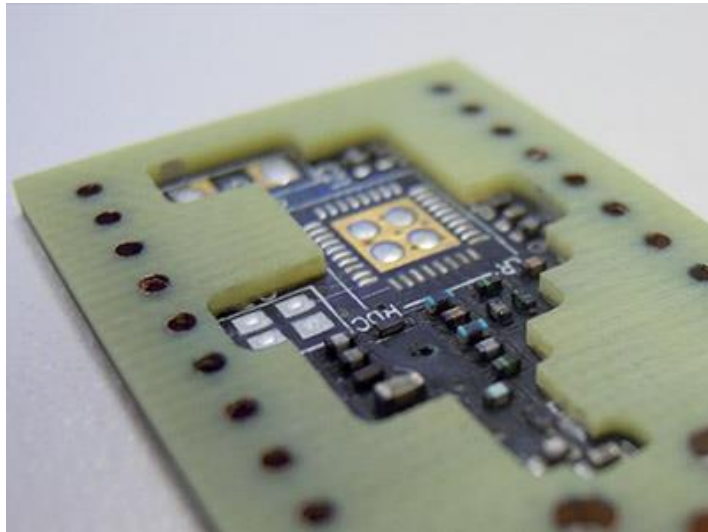


- Rigid-Flex Types

- Flex to Install - This type of flexible circuit is bent once and designed to stay in its bent configuration for its life span.
- Dynamic Flex - This type of flexible circuit is capable of withstanding continuous flexing. An example may be the flex cable that connects the print head of an ink-jet printer to the mother board.



- What is an embedded component?
 - Any component not mounted on outer layers
 - Screened Components
 - Components in Cavities

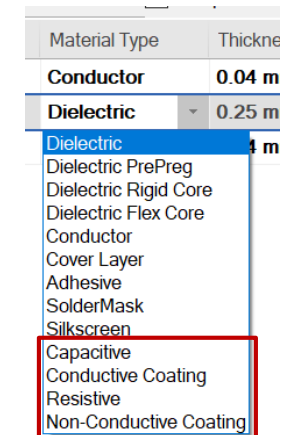
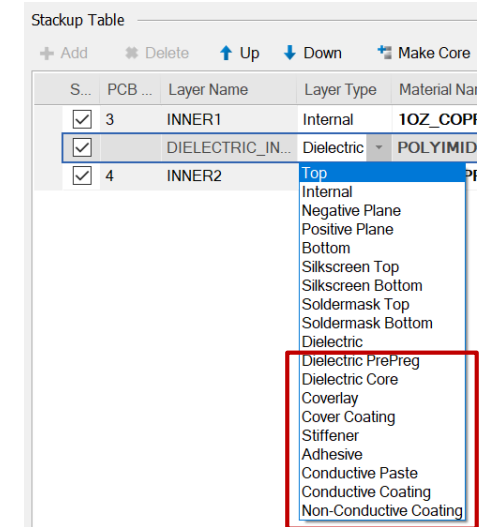
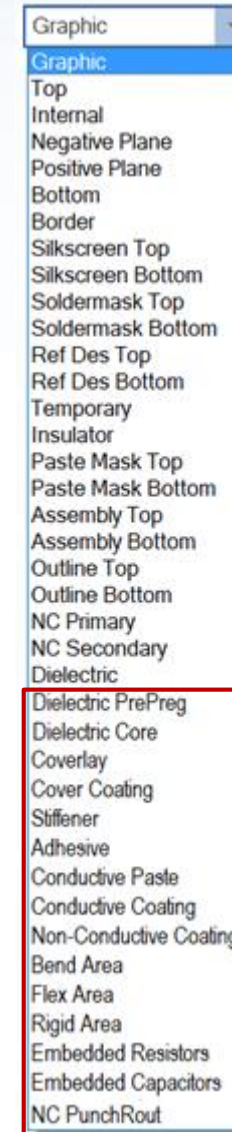


- **What is Rigid-Flex/Embedded Data?**
 - Additional Rigid-Flex and Other Layer Types
 - Rigid-Flex Specific Areas
 - Layer Profiles
 - Unique Shape Definition for Each Layer
 - Cavities
 - Inferred from layer profiles
 - Multiple Layer Stackups
 - NC Punch Data
 - Parts Mounted on Inner Layers

- New Database Layer Types

- Dielectric PrePreg
- Dielectric Core
- Cover Coating
- Conductive Paste
- Conductive Coating
- Non-Conductive Coating
- Embedded Resistors
- Embedded Capacitors

- NC PunchRout
- Coverlay
- Flex Area
- Bend Area
- Rigid Area
- Stiffener
- Adhesive



8.1.2 ODB++ Layer Import

ODB++ Layer Type	DIELECTRIC_TYPE	ADD_TYPE	New Layer Type
DIELECTRIC	PREPREG		Dielectric PrePreg
DIELECTRIC	CORE		Dielectric Core
SOLDER_MASK		COVERLAY	Coverlay
SOLDER_MASK		COVERCOAT	Cover Coating
CONDUCTIVE_PASTE		SILVER_MASK	Conductive Paste
CONDUCTIVE_PASTE		CARBON_MASK	Conductive Paste
SOLDER_MASK		STIFFENER	Stiffener
SOLDER_MASK		PSA	Adhesive
MASK		IMMERSION_MASK	Conductive Coating
MASK		OSP_MASK	Non-Conductive Coating
MASK		EMBEDDED_R	Embedded Resistors
MASK		EMBEDDED_C	Embedded Capacitors
MASK		BEND_AREA	Bend Area
MASK		FLEX_AREA	Flex Area
MASK		RIGID_AREA	Rigid Area
ROUT		PUNCH	NC PunchRout

Export from Valor only

Rev B IPC-2581 Layer Import

IPC-2581 LayerFunction Type	New Layer Type
DIELCOVERLAY	Coverlay
DIELADHV	Adhesive
DIELCORE	Dielectric Core
CONDUCTIVE_ADHESIVE	Conductive Paste
COATINGCOND	Conductive Coating
COATINGNONCOND	Nonconductive Coating
CAPACITIVE	Embedded Capacitors
RESISTIVE	Embedded Resistors

Note: Core definition has been present in both ODB++ specification and IPC-2581 specification for some time.

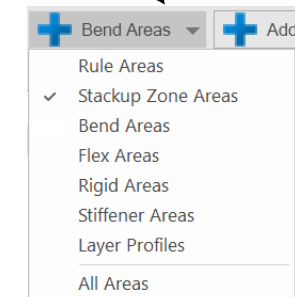
DownStream is the first CAD/CAM Vendor to import and export properly formatted core specification.

- **New Area Types Added to Areas Pane**
 - Flex Area – Area of design that contains only flexible materials
 - Imported as a filled shape on its respective Flex Area Layer
 - Duplicated as an area shape similar to a rule area
 - Bend Area – Area of design that is bent (commonly in a Flex Area)
 - Imported as a filled shape on its respective Bend Area Layer
 - Duplicated as an area shape similar to a rule area
 - Rigid Area – Area of design that contains (mostly) Rigid materials
 - Imported as a filled shape on its respective Rigid Area Layer
 - Duplicated as an area shape similar to a rule area
 - Stackup Zone Area – Area of design where a specific stackup is present
 - Imported as an area shape similar to a rule area
 - Stiffener Area – Area of design that contains stiffener (non-conductive) materials
 - Imported as an area shape similar to a rule area
 - Layer Profile – Profile (or shape) of a copper, dielectric or other layer
 - Imported as an area shape similar to a board outline
 - Shown on relevant stackup layers similar to a board outline

Areas

Stackup Zone Areas ▾ + Add - Delete ⚙ Move

Sh...	Area Name	Stackup
<input type="checkbox"/>	Entire Region	Default
<input checked="" type="checkbox"/>	Zone 1	Primary
<input type="checkbox"/>	Zone 2	Flex
<input checked="" type="checkbox"/>	Zone 3	RigidFlex



- New Area Types Sourced from Supported Imports

Area Type	ODB++ Pre 8.0	Xpediton & DST ODB++ 8.1.2	Other IPC-2581 B	Zuken IPC-2581 B	Cadence & DST IPC-2581 B+ ²
Bend Area	N/A	X	Derived ¹	Derived ¹	Derived ¹
Flex Area	N/A	X	Derived ¹	Derived ¹	Derived ¹
Rigid Area	N/A	X	Derived ¹	Derived ¹	Derived ¹
Stiffener Area	N/A	X	N/A	N/A	DST export only
Stackup Zone Area	N/A	X	N/A	N/A	X
Layer Profiles	N/A	X	N/A	N/A	X
Embedded/Cavities	N/A	Derived ³	N/A	X	X

To Derive Areas:
 If Layer name:
 “bend_area”; or
 “flex_area”; or
 “rigid_area”; AND
 layerFunction type:
 “DOCUMENT”

All layer content
 imported to
 respective layers

Notes:

1. Area Types not defined in current 2581 exports. Areas are derived during import from layer name and layerFunction type.
2. IPC-2581 B+ = rev b titled, but includes newer rev c rigid-flex definitions
3. Cavities derived from layer profiles.
4. PADS ASCII does not support rigid-flex or embedded/cavity constructs

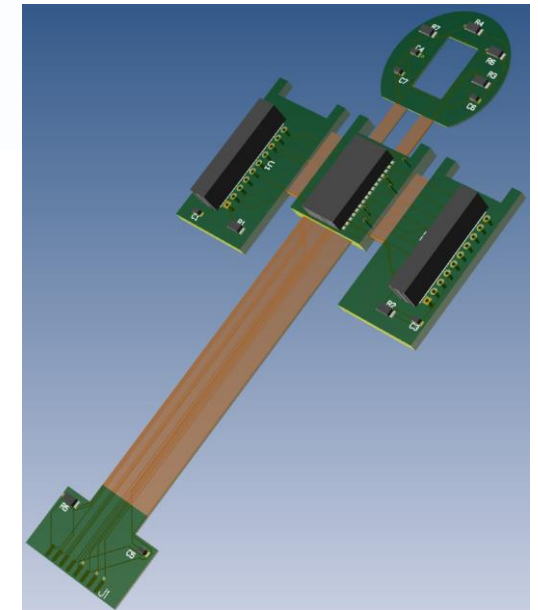
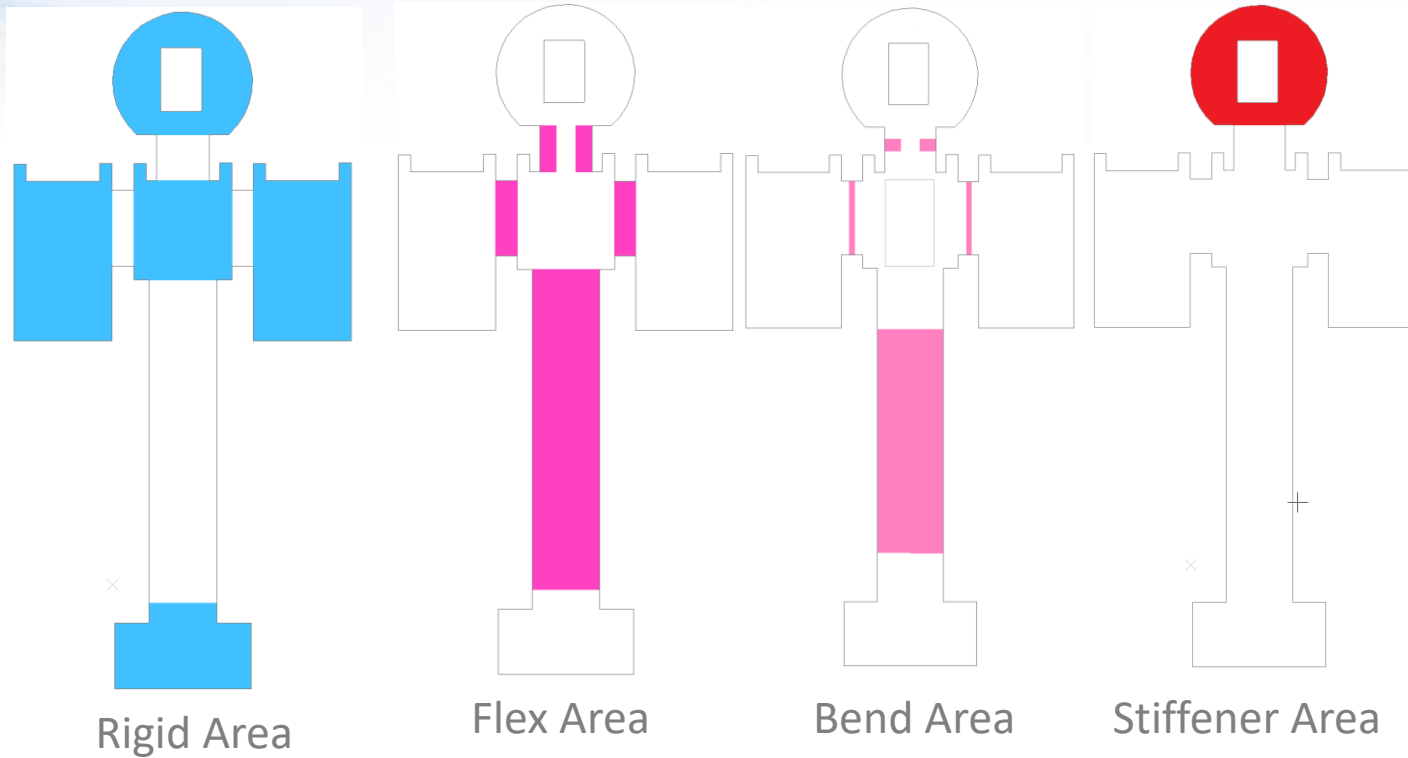
- New Areas Exported from CAM350

Area Type	ODB++ 8.1.2	IPC-2581 B+ Rigid-Flex
Bend Area	X	Derived ¹
Flex Area	X	Derived ¹
Rigid Area	X	Derived ¹
Stiffener Area	X	Derived ^{1,2}
Stackup Zone Area	X	X
Layer Profiles	X	X
Embedded/Cavities	X	X

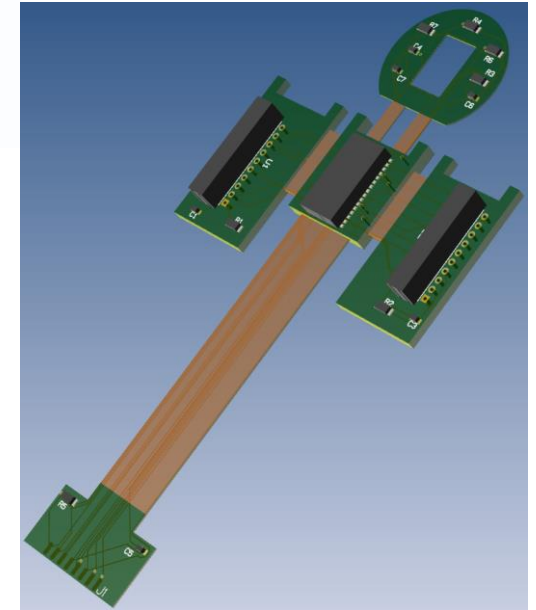
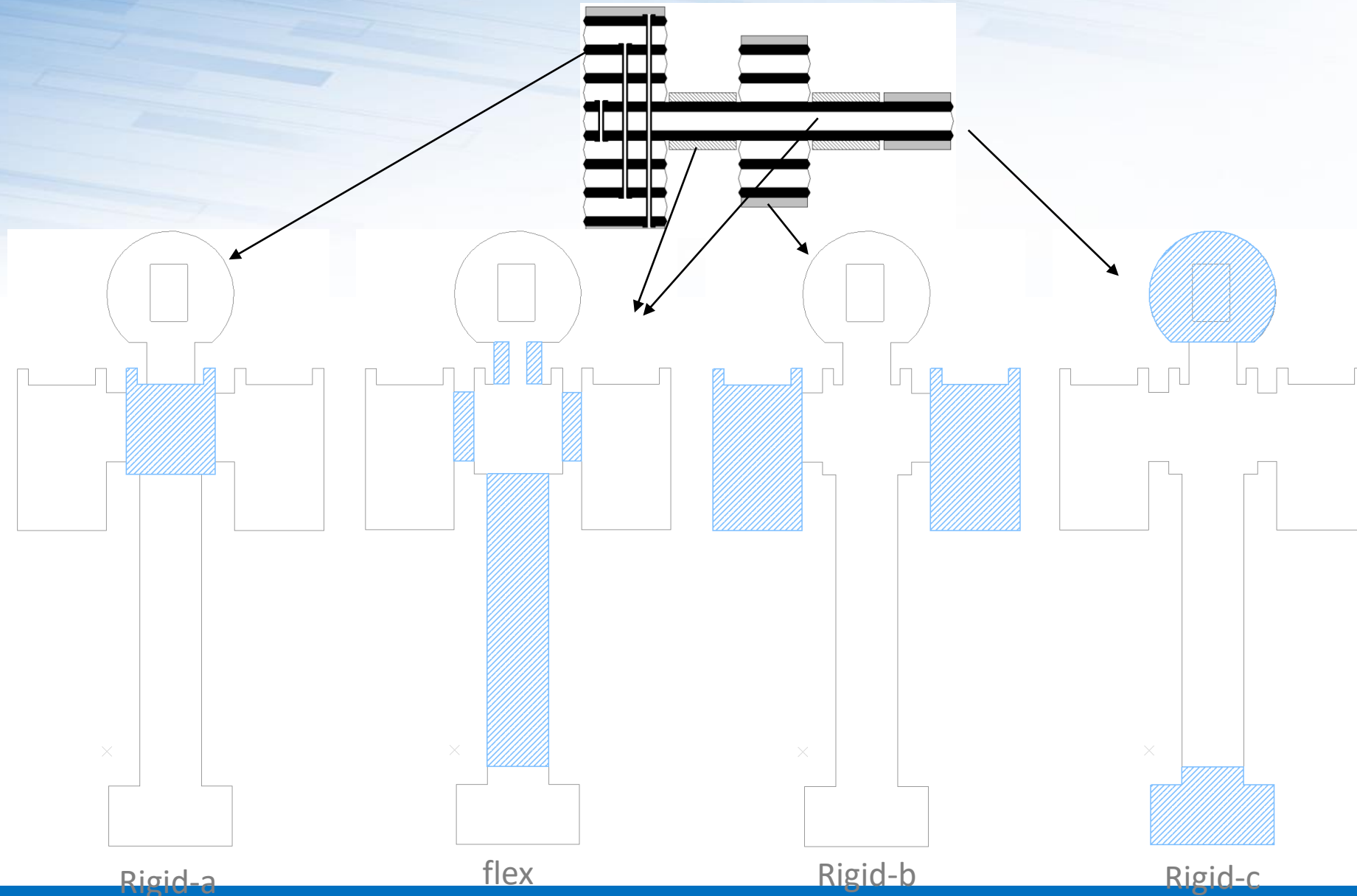
Notes:

1. Exported to an IPC-2581 B+ = rev b titled file, but includes newer rev c rigid-flex area definitions
2. New layerFunction="STIFFENER" (not area) exported from CAM350 IPC-2581 but not likely supported by other tools until rev c released
3. PADS ASCII does not support rigid-flex or embedded/cavity constructs

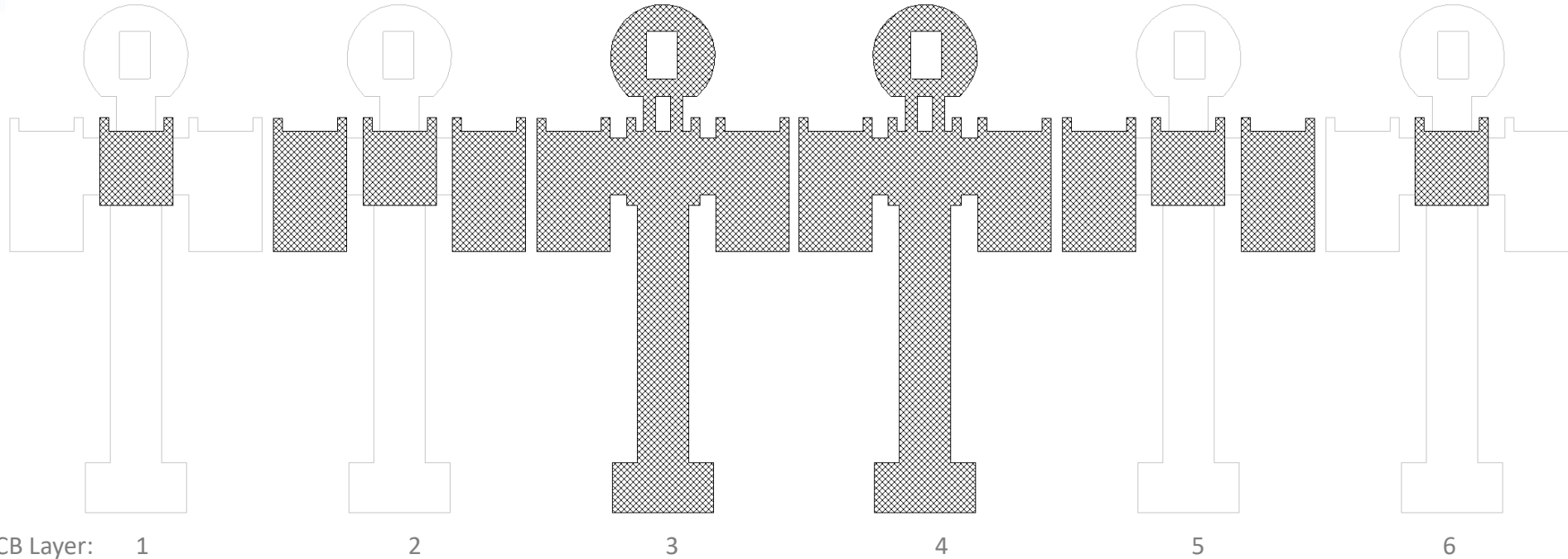
Rigid, Flex, Bend and Stiffener Areas



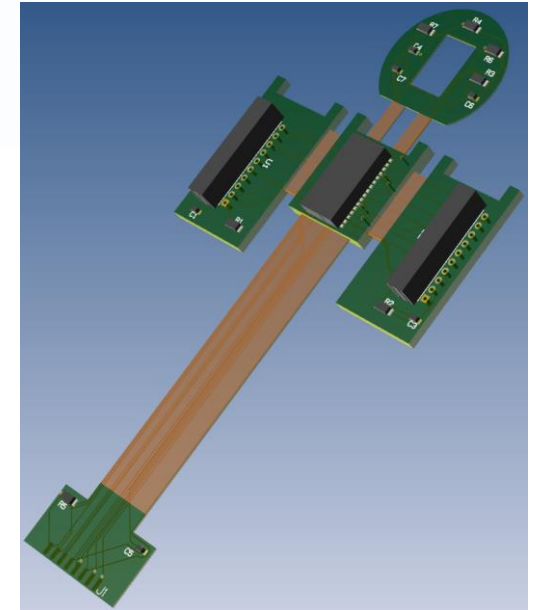
Stackup Zones



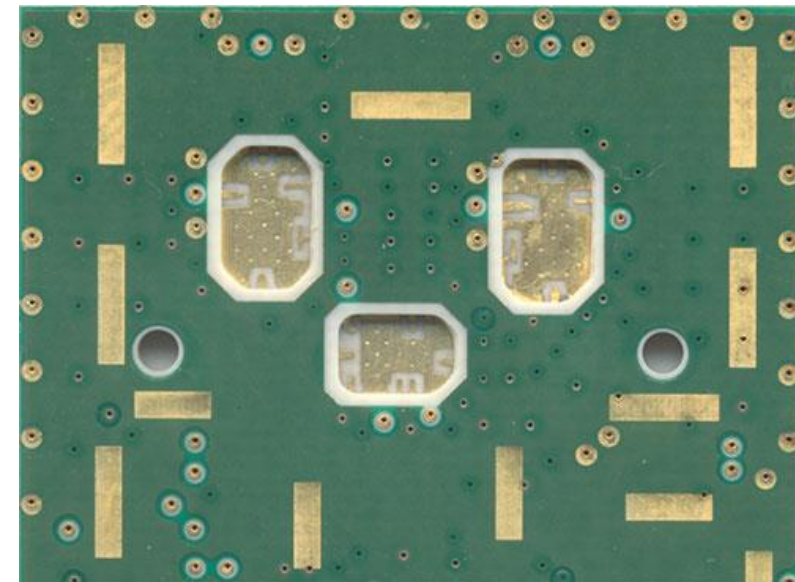
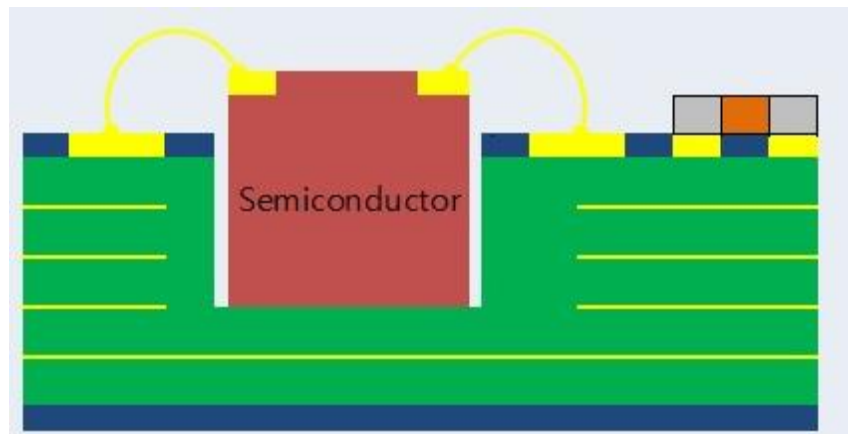
- Layer Profiles
 - Unique shape per layer



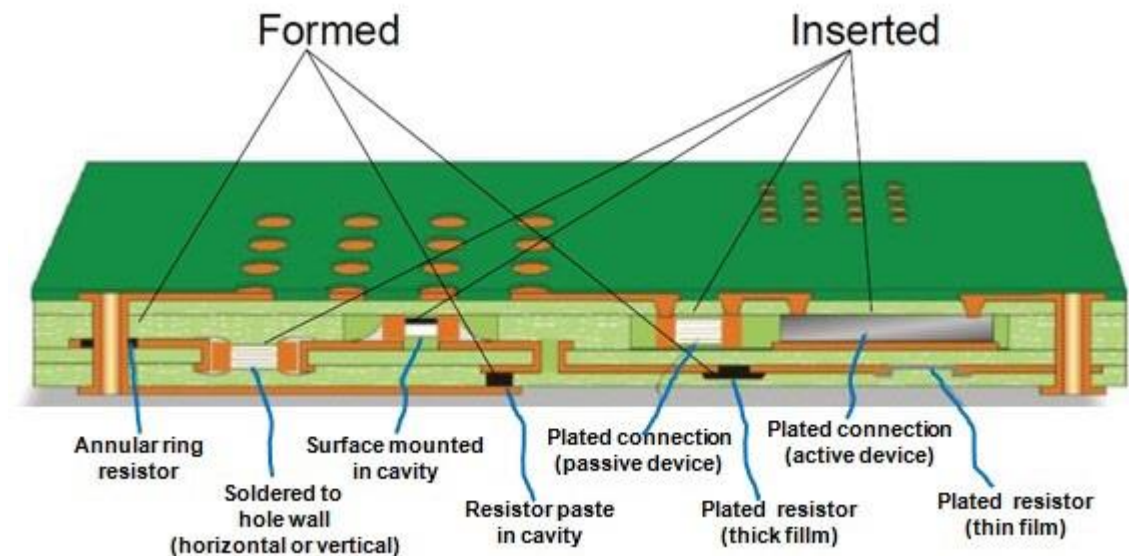
Note: Board Outline shown for clarity



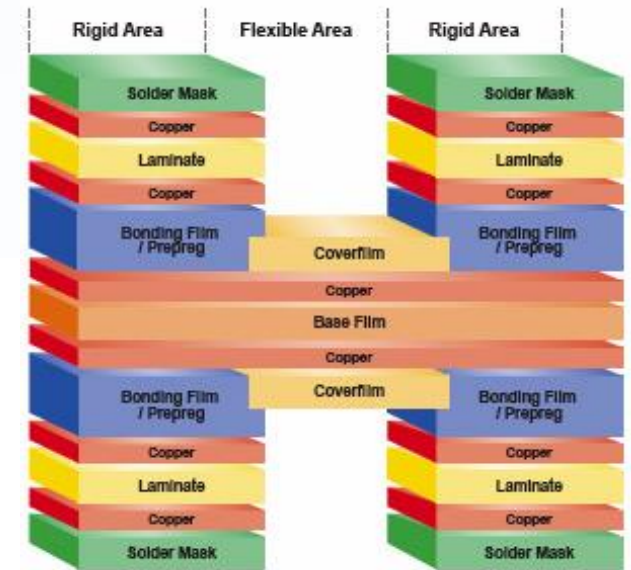
- Cavities
 - Derived from layer profiles
 - Voids on consecutive layers
 - Partial layer depth versus board cutouts
 - Note: There is no “Cavity” database object



- **Parts on any layer**
 - Parts on a layer other than Top or Bottom
 - Parts can be mounted on either side of a layer
 - Side = Side it is inserted from – Top or Bottom
 - Parts can be:
 - Inserted – mechanically or hand inserted
 - Formed – Screened using conductive inks/silver
 - Embedded – Parts mounted in a cavity



- Layer Display Pane and Layers Pane
- Colors
- Areas Pane
- Stack Up Visualizer
 - Rigid-Flex Stackup Support
 - Core Definition
 - Materials Table now sharable
 - Improved Table Synchronization
- 3D Viewing
 - True Rigid-Flex visualization
- Design Analyzer
 - New default Vendor list installed
 - Vendors now shareable
- DFM Analysis updates
 - Rigid-Flex Stackup Support
 - Silkscreen, Soldermask and Pastemask
 - Vias in pads
 - Expanded Drill Checks



- Vias in Pad
- Through Vias in Pad

Drill spacing						
All	Via	Laser	Buried	Blind	Unplated	Backdrill
Backdrill	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0
Unplated	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	
Blind	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0		
Buried	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0			
Laser	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 5.0				
Via	<input checked="" type="checkbox"/> 5.0					

- SUV – Covered in CAM350 Demo
- New Rigid-Flex Templates
- New 3D Rigid-Flex Template
- Updated Dimensions for all Stackups
- Updated BackDrill Template

