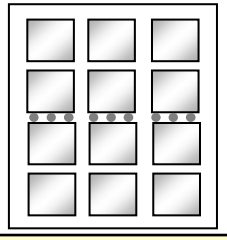
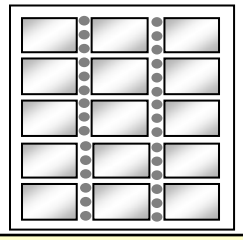
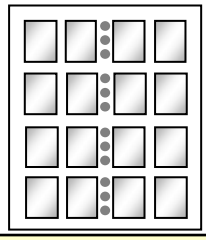
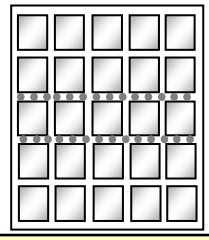
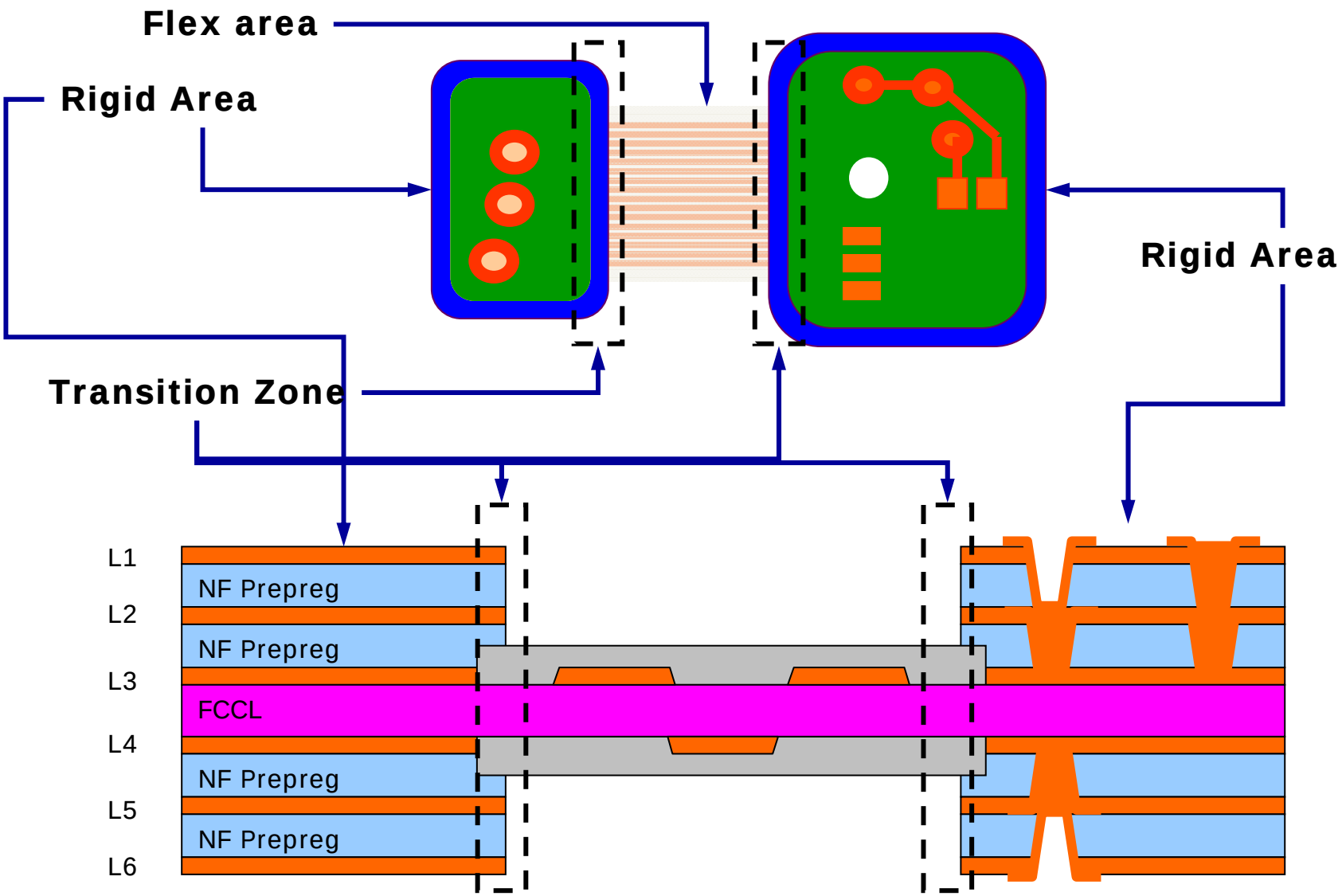
Optimized Panel Utilization

Design Rule

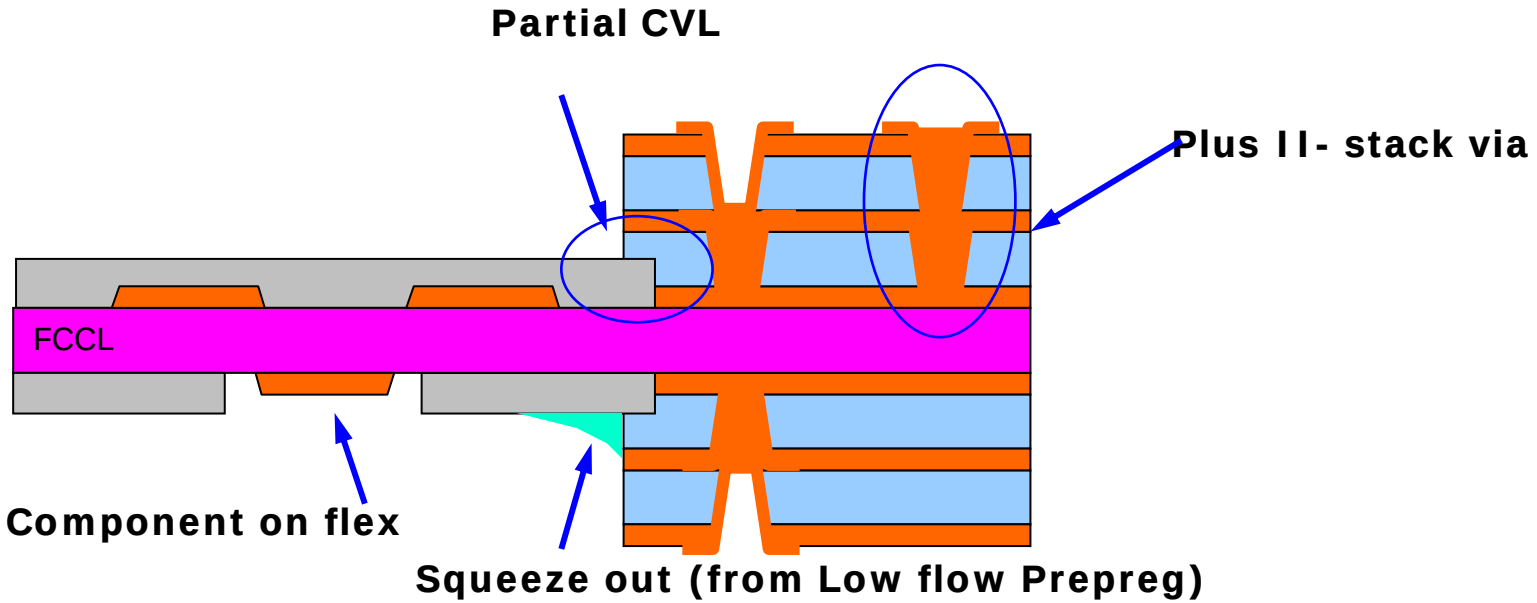
Panel type / Panel size	Optimized. Array Size			
				
16“X19.685”	4.4212“x4.6” (77%)	3.517“x4.6” (77%)	4.4212“x3.425” (77%)	3.517“x2.72” (76%)
17“X19.685”	4.4212“x4.8” (76%)	3.517“x4.8” (76%)	4.4212“x3.675” (77%)	3.517“x2.92” (76%)
18“X19.685”	4.4212“x5.1” (76%)	3.517“x5.1” (76%)	4.4212“x3.925” (78%)	3.517“x3.12” (77%)

Design Rule


Flex area
Rigid Area
Rigid Area
Transition Zone
L1
NF Prepreg
L2
NF Prepreg
L3
FCCL
L4
NF Prepreg
L5
NF Prepreg
L6

Design Rule

Terms & Definition:



FCCL: Flex Copper Clad Laminate

CVL: Cover layer

Stiffener: FR4 / PI / Stainless base Reinforcement

Low flow Prepreg: Resin scale flow lower than normal type

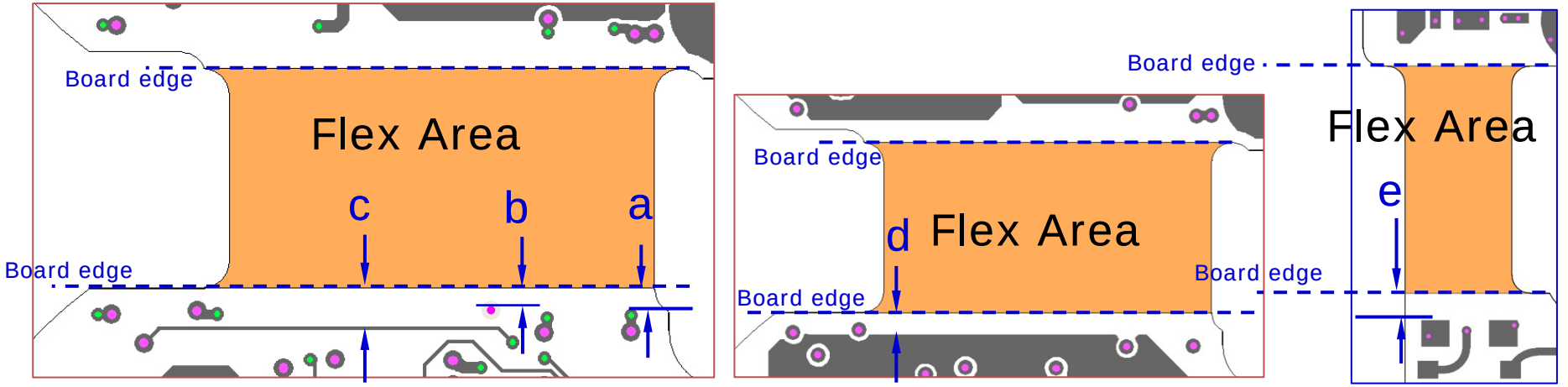
BS: Bonding Sheet

SF: Silver Foil (EMI shielding)

Design Rule

Trace and component pad at transition zone:

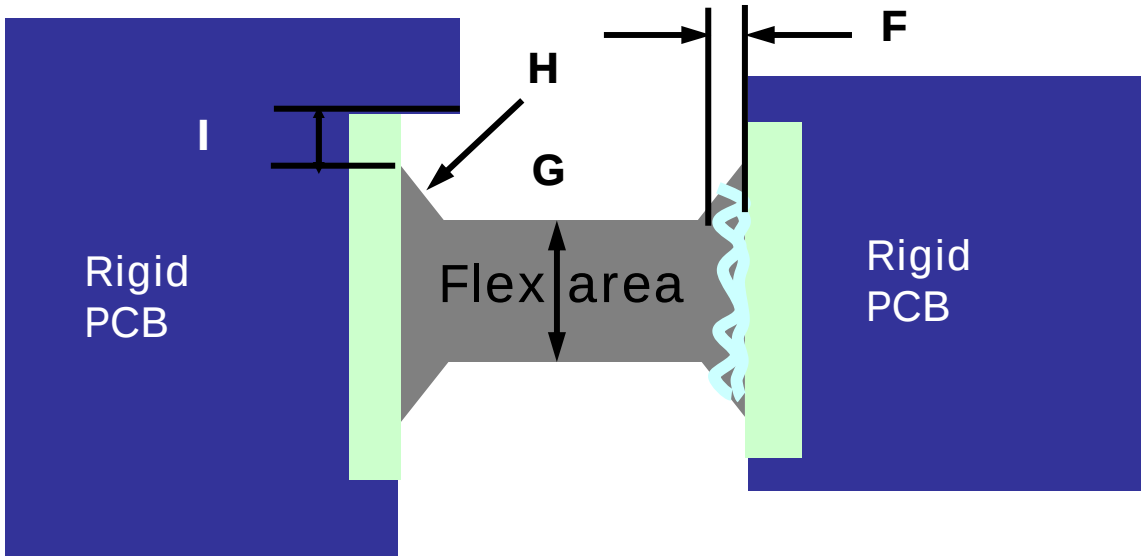
				Standard	Advanced
1	e	SMT pad (edge of pad) to board edge spacing	Rigid/Flex	400um	300um
2	d	Shield can (edge of ground) to board edge spacing	Rigid/Flex	300um	200um
3	d	Ground plane to board edge spacing	Rigid/Flex	300um	200um
4	d	Power plane to board edge spacing	Rigid/Flex	300um	200um
5	c	Trace (edge of trace) to board edge spacing	Rigid/Flex	400um	250um
6	a	Micro-via (edge of pad) to board edge spacing	Rigid/Flex	400um	300um
7	b	Plated through hole (edge of pad) to board edge spacing	Rigid/Flex	400um	300um
8	b	Non plated through hole to board edge spacing (no pad)	Rigid/Flex	300um	200um
9	b	Buried via (edge of pad) to board edge spacing	Rigid/Flex	400um	300um



Design Rule

Mechanical design at transition zone:

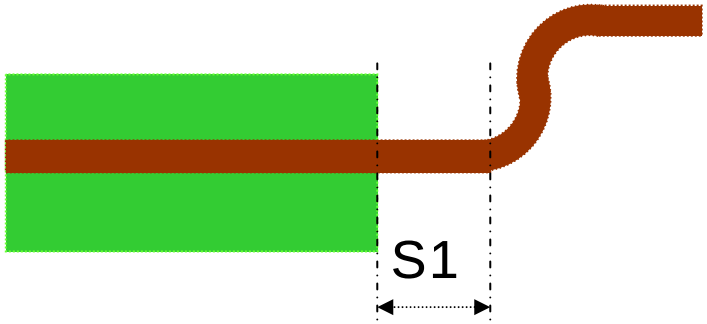
				Standard	Advanced
10	F	Adhesive squeeze out	Rigid/Flex	0.80mm	0.50mm
11	G	Minimum flex width	Flex	2.00mm	1.00mm
12	H	Flex outline radius	Flex	1000um	500um
13	I	Milling path	Rigid/Flex	1.00mm	0.80mm

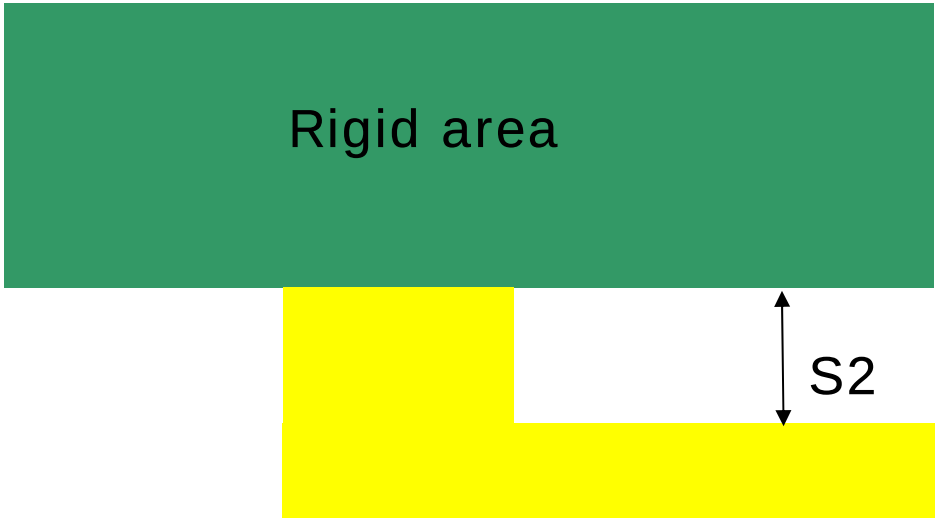


Design Rule

Mechanical design at transition zone:

Item	Design Issue	Standard Guideline	Advanced Guideline
S1	Minimum "S1" bending to board edge distance	1.00mm	0.80mm
S2	minimum flexible area (edge of FPC) to board edge spacing	2.00mm	1.50mm

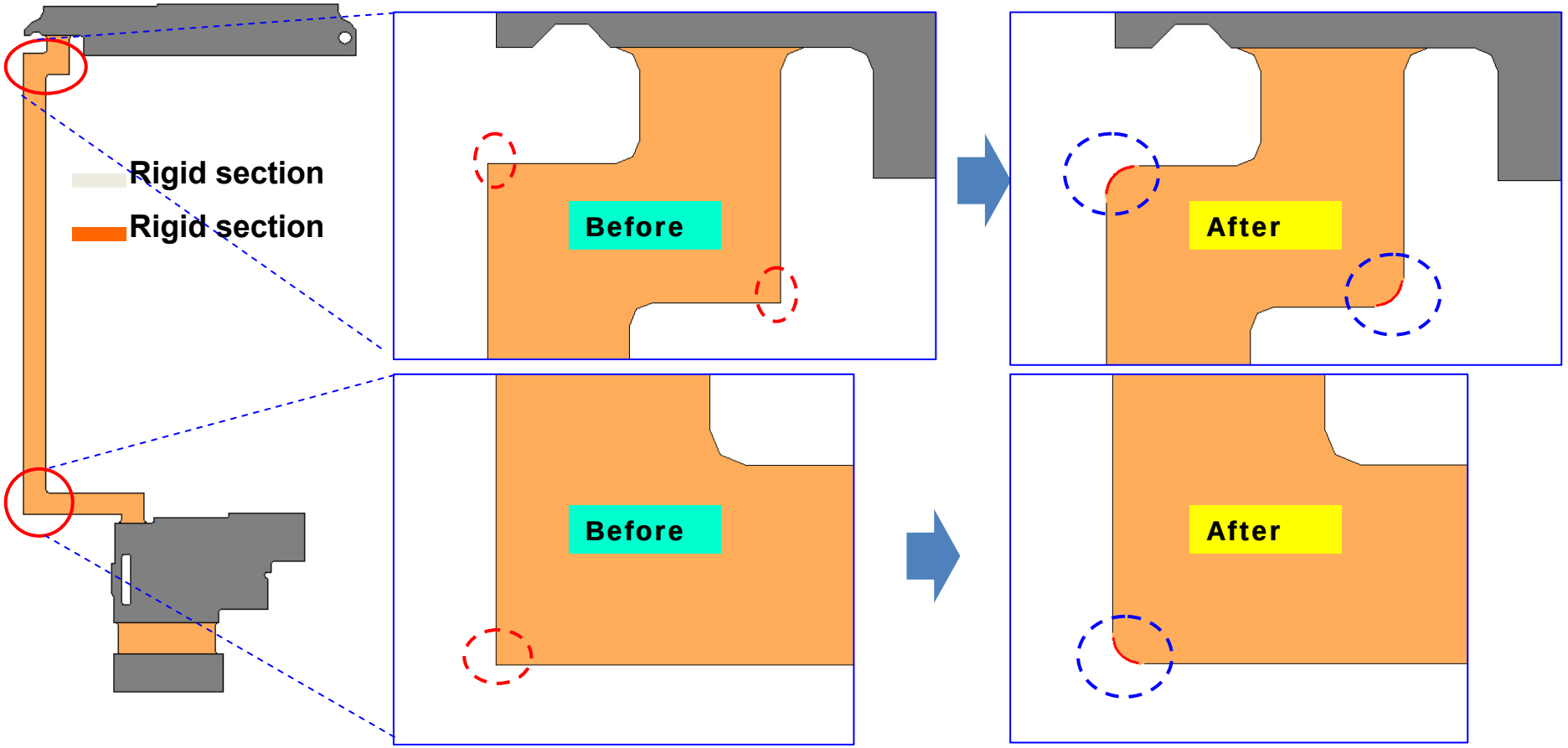




Design Rule

Mechanical design for flex radius:

Punch with hard die requirement, suggest to place radius 0.50mm. **(Change from right angle to radius. Only UV laser cutting can make it right angle.)**



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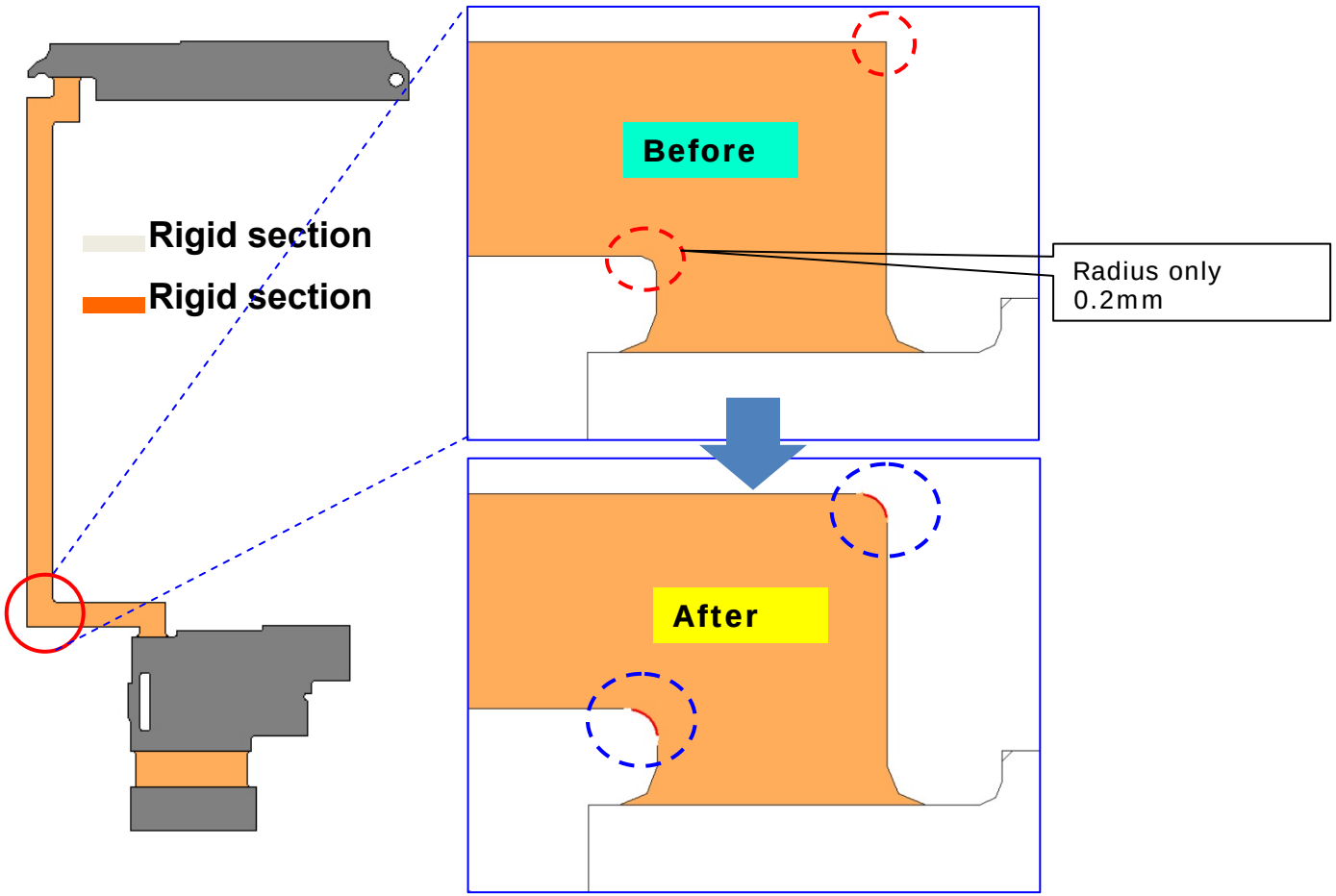
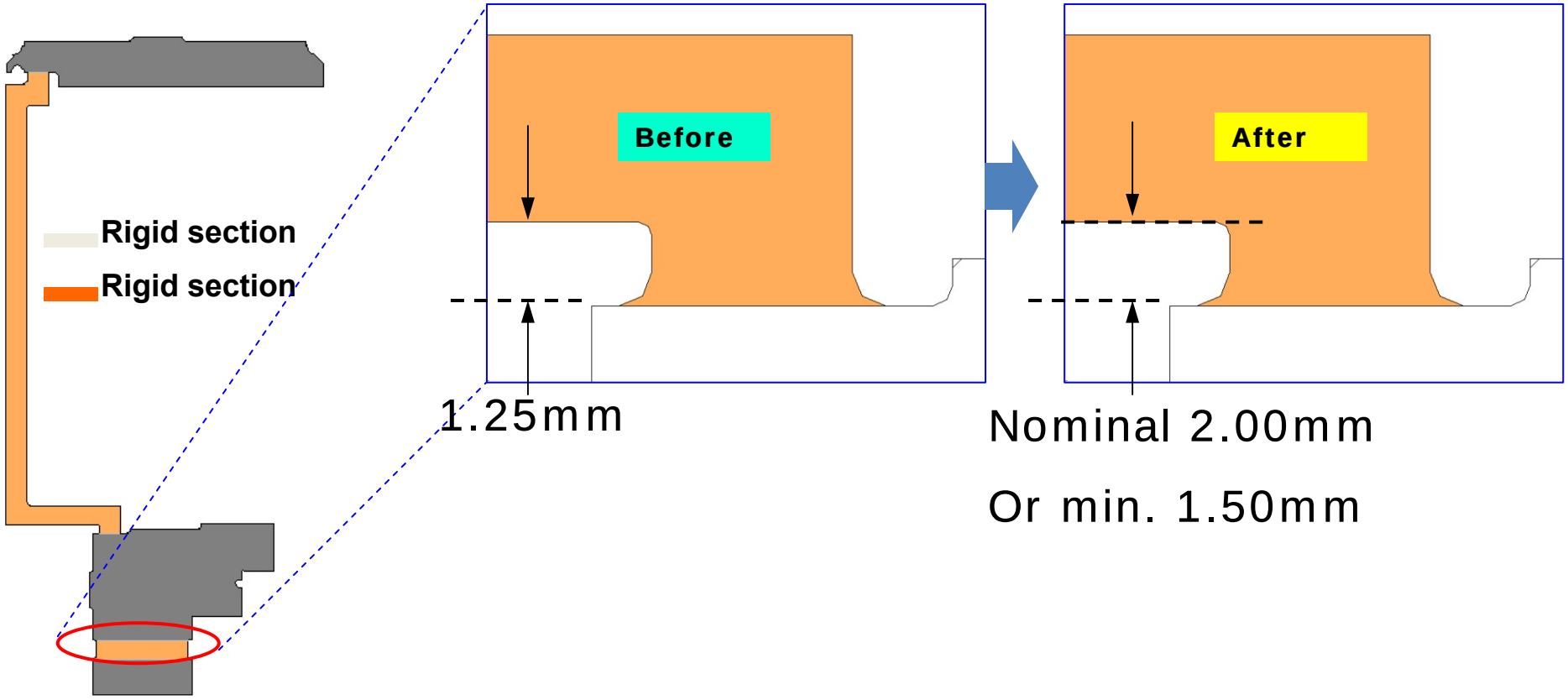


Design Rule

Mechanical design for flex outline:

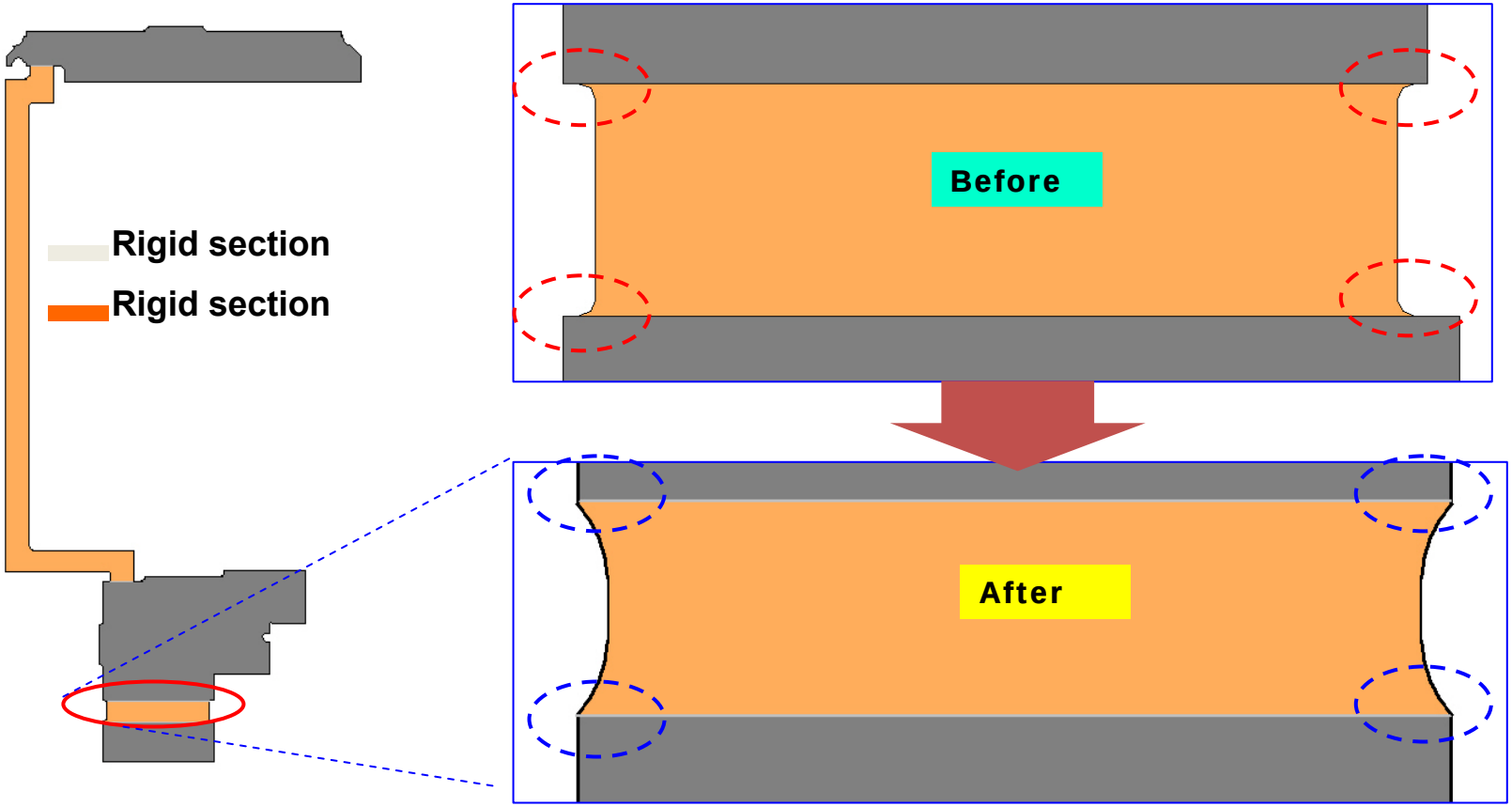
suggest to make this waste slot as min. 1.50mm wide.



Design Rule

Mechanical design for flex outline:

suggest to make these corners as full radius.



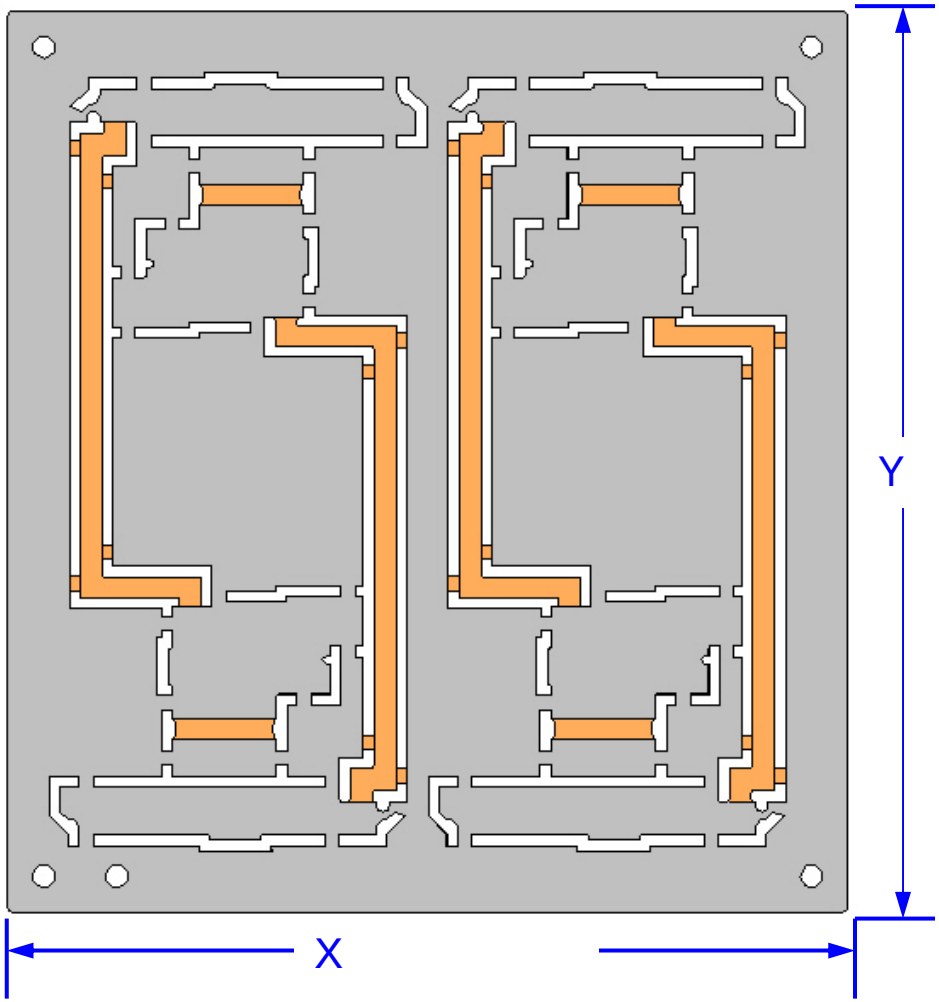
Key points:

The quality of appearance inspection for these corners will be better. **(Burr-both rigid and flex material will be less than previous design.**

Design Rule

Mechanical design for panelization:

suggest to place two pcs in zero degree direction and the other two pcs **in 180 degree rotation**.



Key Points:

All outline should be symmetrical.

(Incl. waste material slot)

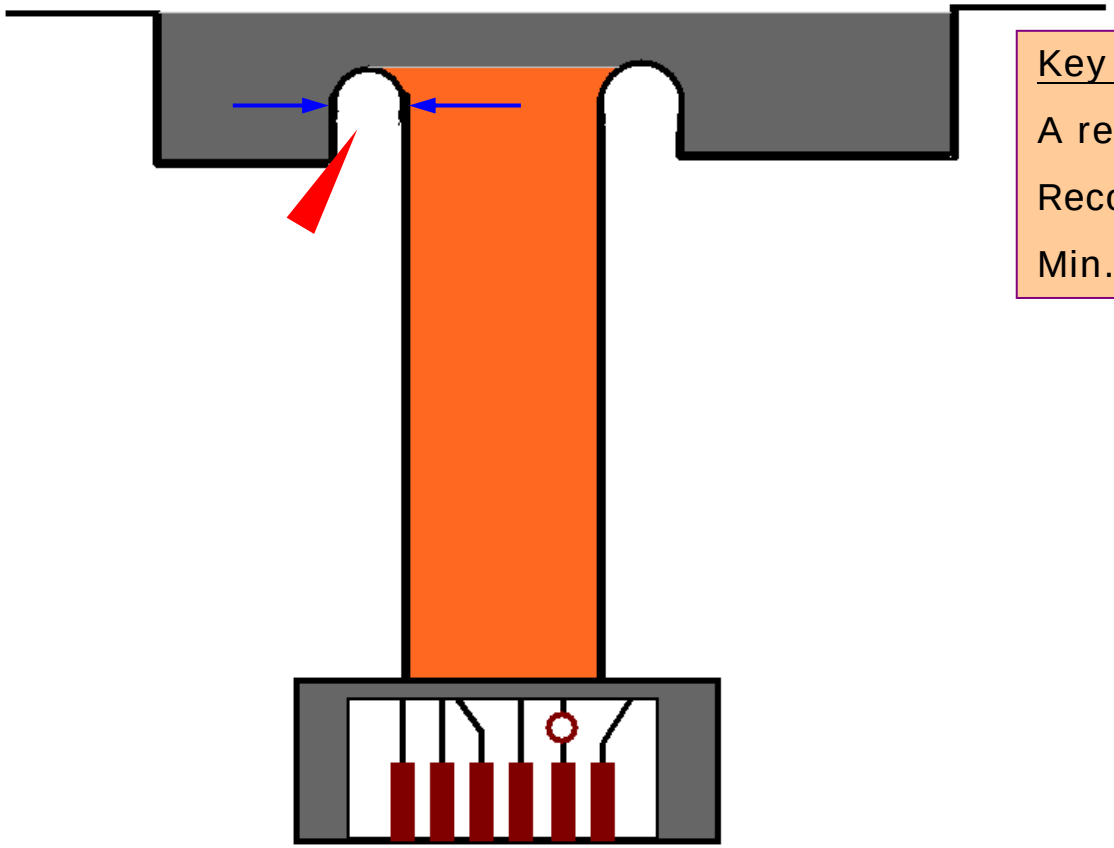
Rigid section

Rigid section

Design Rule

Mechanical design for transition zone:

Provide tear resistance, suggest to place recessed slot at the transition zone.



Rigid section

Rigid section

Key Points:

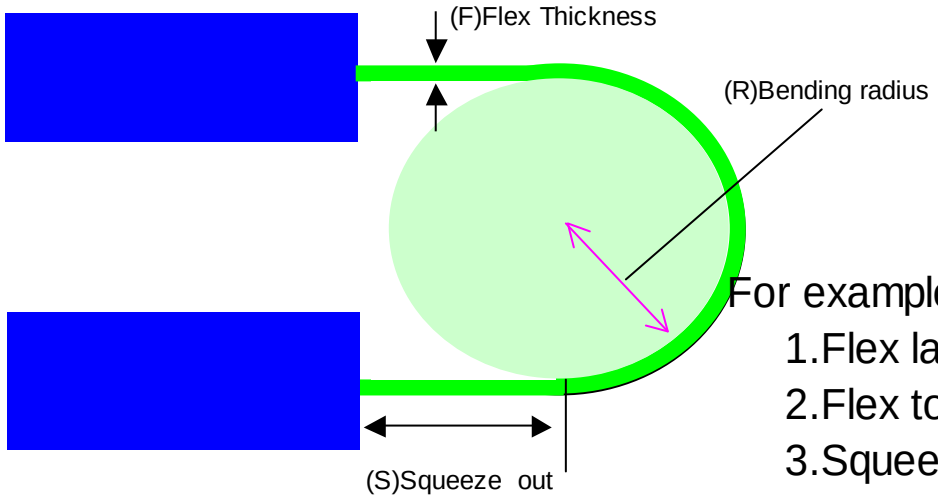
A recess slot would decrease the stress.

Recommended slot width:

Min. 1.50mm; Nominal:2.00mm

Design Rule

Mechanical design for bending criteria: Radius & Flex length



(T)-Flex Thickness
(S)-Squeeze out
(R)-Bend radius

No	Flex Layer	Bend radius
1	1-2Flexs	R= 6x max. (T)
2	>2Flexs	R=12x max. (T)
3	plated Flex	R=20x max. (T)

The information referance to the MIL-P-50884C document

For example:

1.Flex layers=2 layers

2.Flex total thickness = 0.10mm

3.Squeeze out=max. 1.0mm

R=6 x max(T)=6 x 0.10mm = 0.6mm

FL=(2 x S)+(π R)

=(2 x 1)+(3.14 x 0.6)

=3.884

Minimum flex length required for a 180 degree bend is 3.884mm min.

Flex Length=(2 x S)+ (π R)

Flex Layer	Flex thickness	Squeeze out	Flex Length(unit:mm)
1-2Flexs	0.1	1	3.884
>2Flexs	0.1	1	6.968
plated Flex	0.1	1	12.28