Geometry of the Tracker in the Flight Instrument

The following slides present an overview of the geometry of the tracker. Dimensions corresponding to constants in the geometry file are indicated in *red italics*.

Some of the elements have slightly different x and y dimensions. For example, the active area of the wafer is 87.552x87.572 mm. If we intend to use only one number, it's better to use the one in the measurement direction (the width, rather than the length).

TKR Geometry Constants for the Flight Instrument

These are the parameters in the xml file.

"**???**" Means I don't understand what this refers to.

modWidth	369.0 mm (tower pitch – 2 walls – 1 gap)
xNum	4
yNum	4
calTrackerGap	28.42 mm
wallGap	2.5 mm
	C
wallThickness	1.5 mm
wallWidth	372.0 mm
convMat	Tungsten and Tungsten alloy
coreMat	Aluminum Hexcell, 1 and 3 pound weight (regular and superglast layers, respectively)
convThickReg	0.105 mm pure tungsten = 3% r.l.
convThickSup	0.723 mm tungsten alloy = 18% r.l.
TKRDetMat	Si
TKRFaceMat	C
TraySpacing	*variable, see table below*
GuardRing	0.974 mm (used to mean dead region)
ssdGap	**???** 0.025 mm if it's the gap between 2 SSD's on the same ladder (or 0.20 mm if it's the gap between 2 ladders)
siWaferSide	89.5 mm
siWaferActiveSide	87.552 mm (width)
stripPerWafer	384 (the center of the 1st strip is 0.114 mm inside the edge of the active region)
nWaferAcross	4
numTrays	19
numNoLeadTrays	3
numSuperGlast	4
SiThick	0.4 mm
TKRWidth	(same as wall width?)
TKRElectGap	4.65 mm
FaceThick	0.200 mm
PanelThick	**???** (closeout=27.92, closeout +2 glues+2 facesheets=28.47, etc…)
NFeChips	6

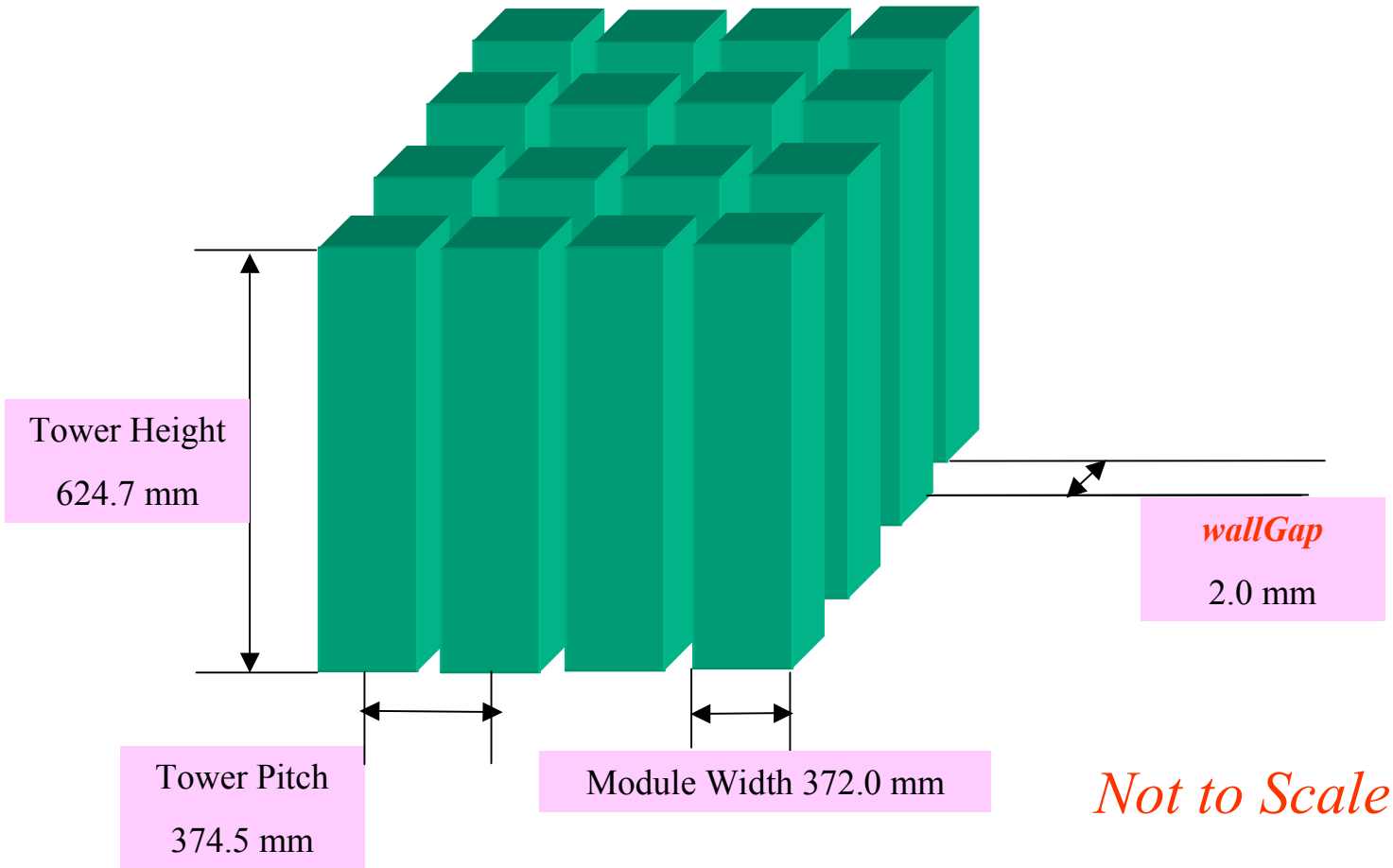
Vertical Dimensions of Stack (in millimeters)
(Zero starts at bottom of bottom face sheet)

Numbers in **bold** represent deviations from routine dimensions.

Tray Type	**Bottom**	**No-Converter**	**SuperGlast**	**Standard**	**Top**
X-Y Gap (above tray)	2.005	2.130	2.127	2.125	N/A
Silicon	0.400	0.400	0.400	0.400	
Glue	0.150	0.150	0.150	0.150	
Bias Plane	0.100	0.100	0.100	0.100	
Glue	0.100	0.100	0.100	0.100	
Face Sheet	0.200	0.200	**0.290**	0.200	0.200*
Glue	0.075	0.075	0.075	0.075	0.075*
Closeout	**33.995***	27.92	27.92	27.92	**33.995***
Glue	0.075*	0.075	0.075	0.075	0.075
Face Sheet	0.200*	0.200	**0.290**	0.200	0.200
Glue			0.100	0.100	0.100
W Converter			**0.723**	0.105	0.105
(Rad Lengths)			**(18%)**	(3%)	(3%)
Glue		0.100	0.100	0.100	0.100
Bias Plane		0.100	0.100	0.100	0.100
Glue		0.150	0.150	0.150	0.150
Silicon		0.400	0.400	0.400	0.400
Number of Modules	1	2	4	11	1

** The top- and bottom-most face sheets are recessed in their respective closeouts. In this table, they are included as part of the stack, and the closeout dimension is reduced accordingly (34.27 -> 33.995)*

Arrangement of Towers in Tracker



Arrangement of Trays in a Tower

Measures Y

Measures X

Etc…

Measures Y

Measures X

Measures Y

1 Top

11 Standard

4 SuperGlast

2 No-Converter

1 Bottom

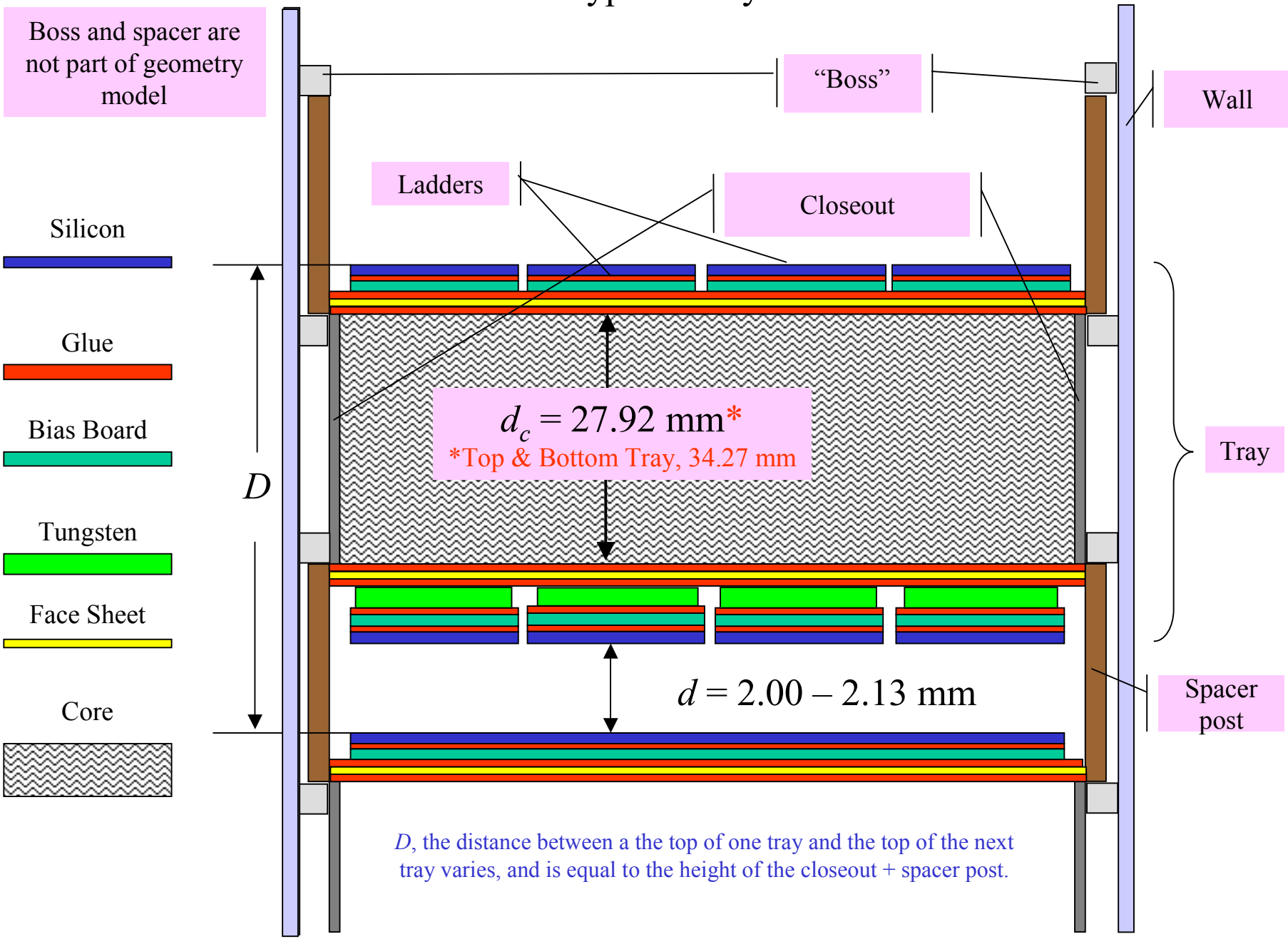
A *Layer* is made up of the top of one tray and the bottom of the next higher tray

19 Trays yield 18 layers.

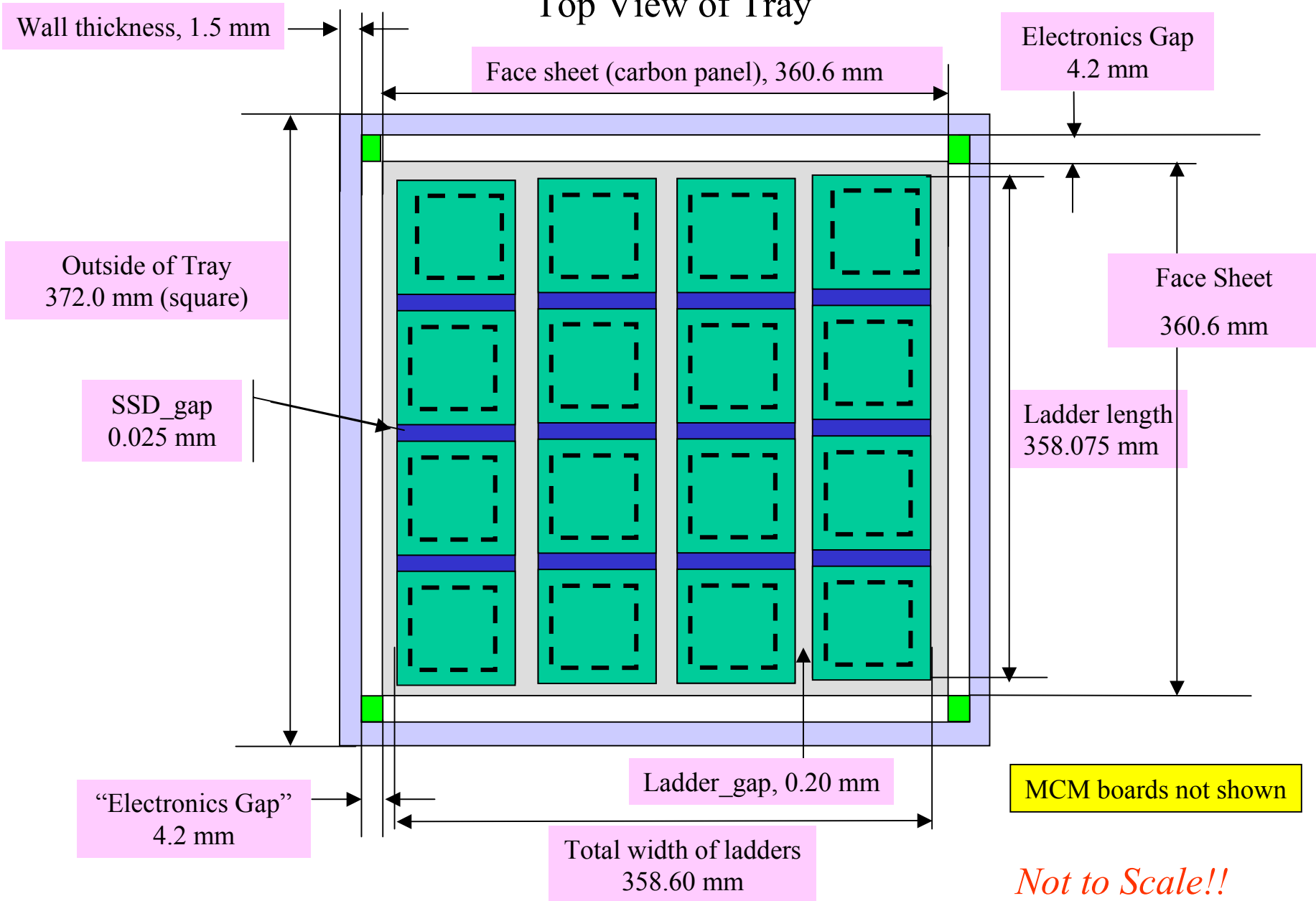
Not to Scale!

Side View of a Typical Tray in a Tower

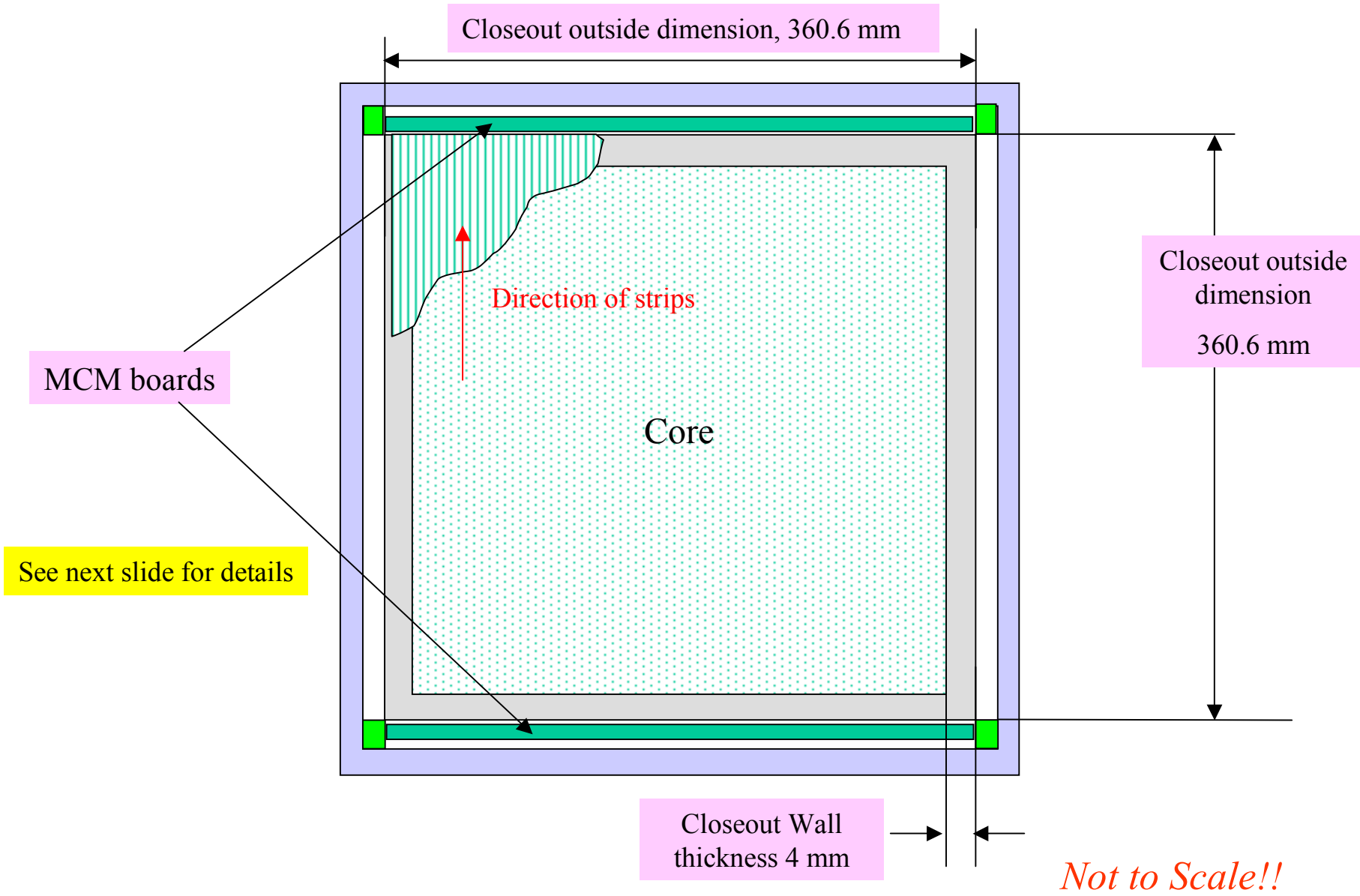
Not to Scale!!



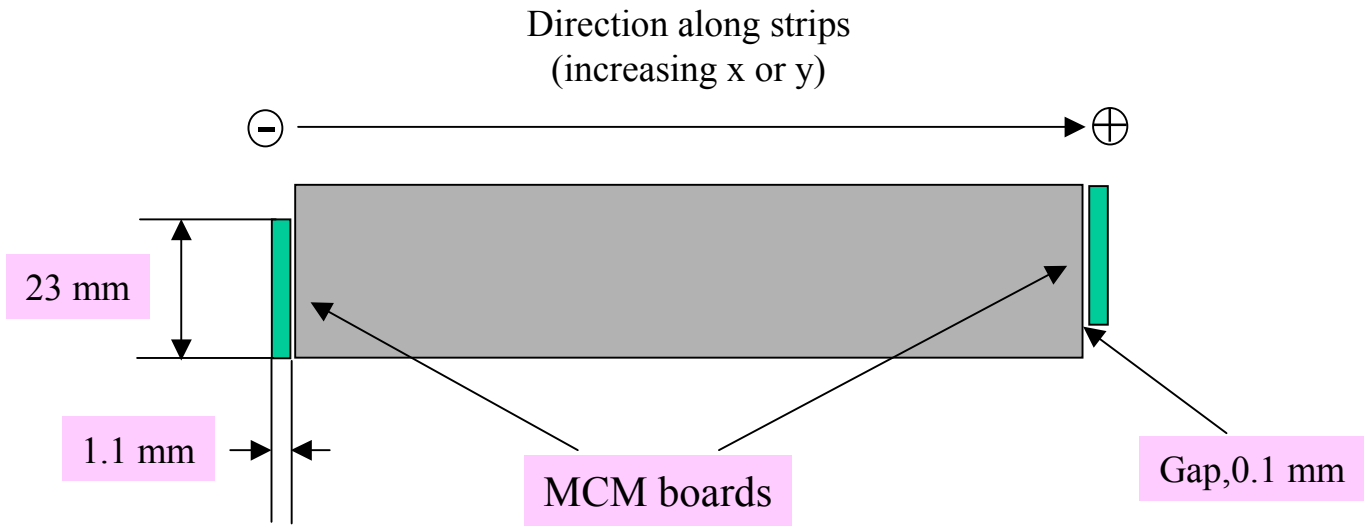
Top View of Tray



Top View of Tray, Face Sheets removed



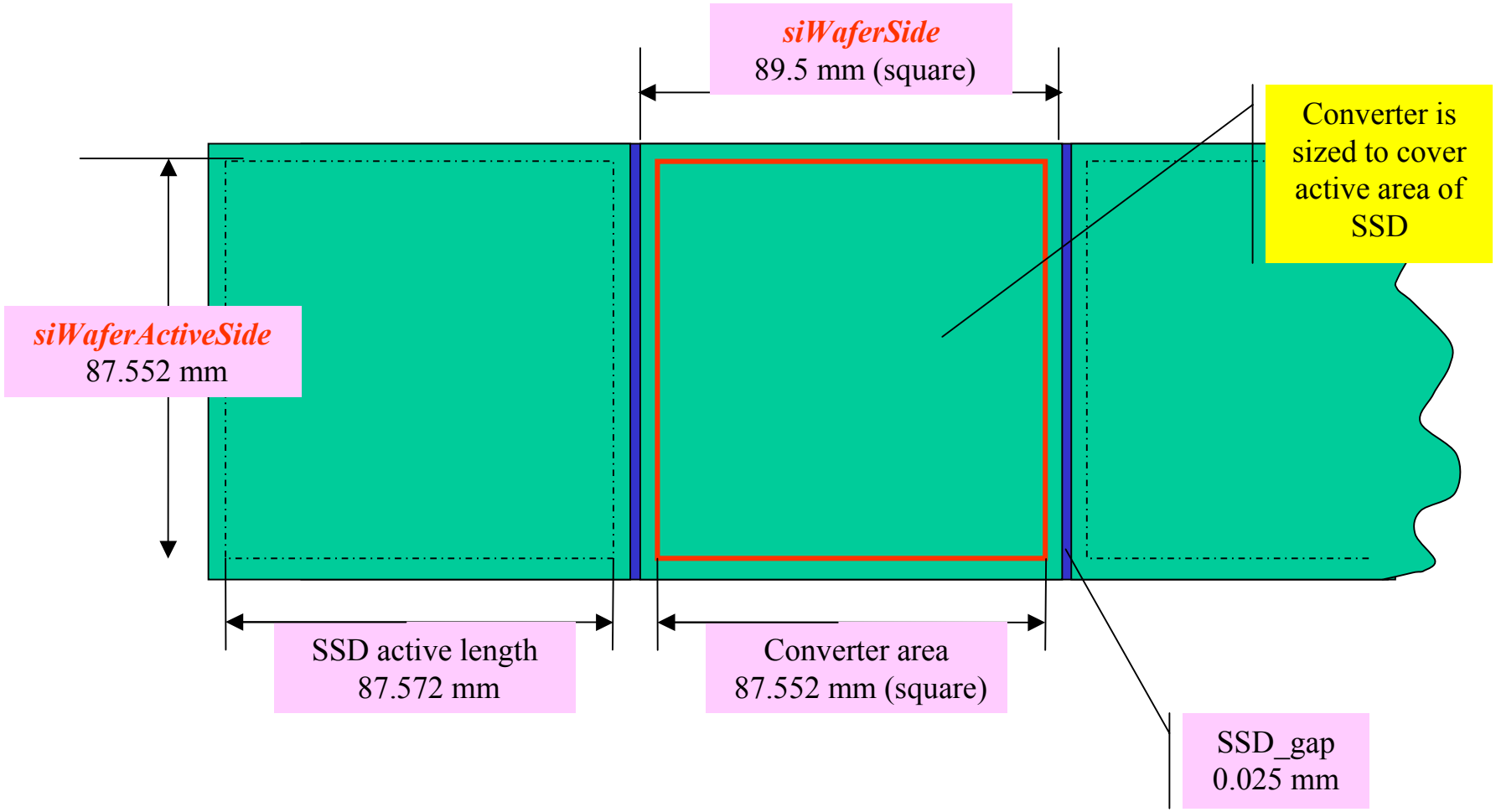
Closeout and MCM boards, Side View



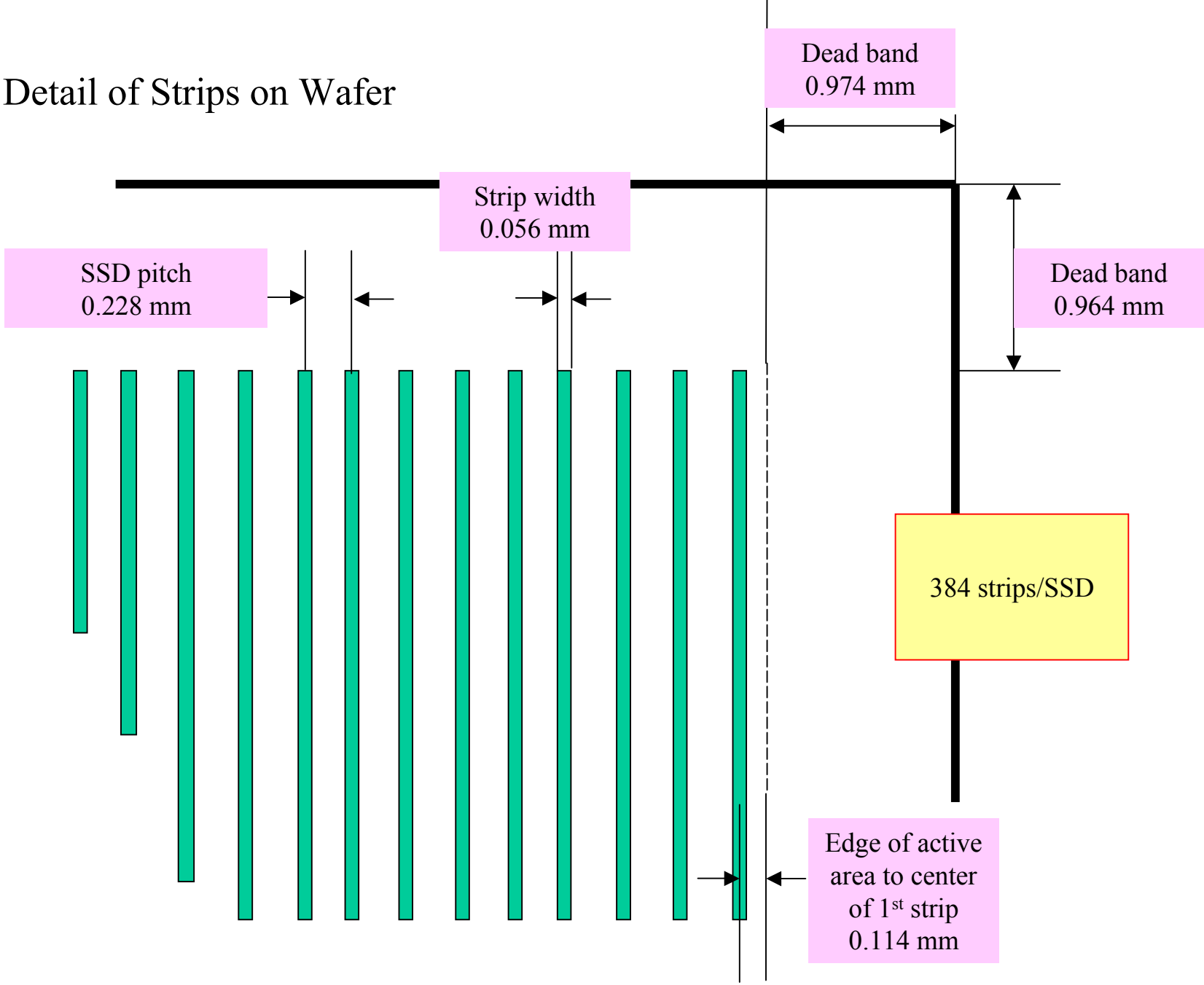
The MCM board a the positive x/y end of the tray feeds the top layer of Si Strips,
and the one at the negative end feeds the bottom layer.
(Top and bottom trays have only one MCM board .)

Not to Scale!!

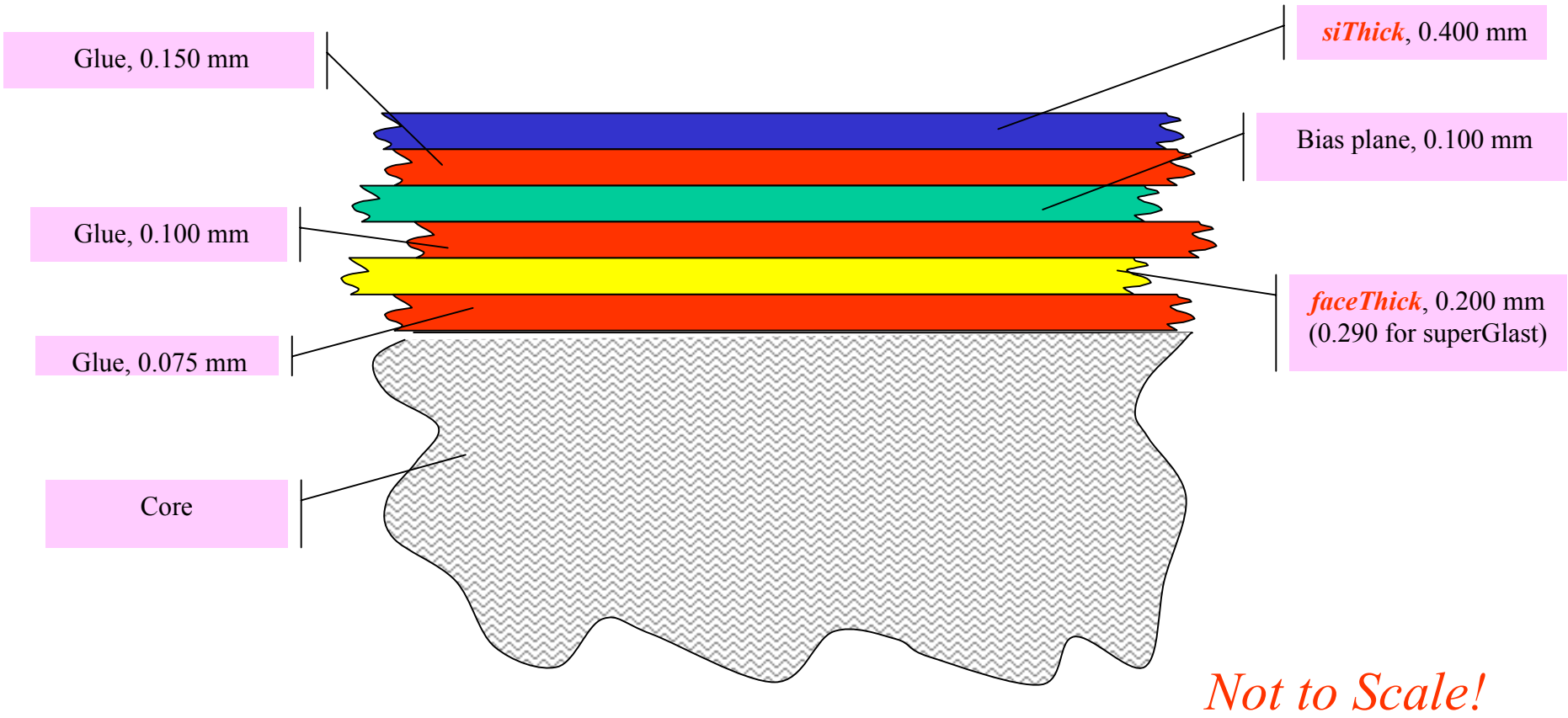
Detail of Ladder and SSDs



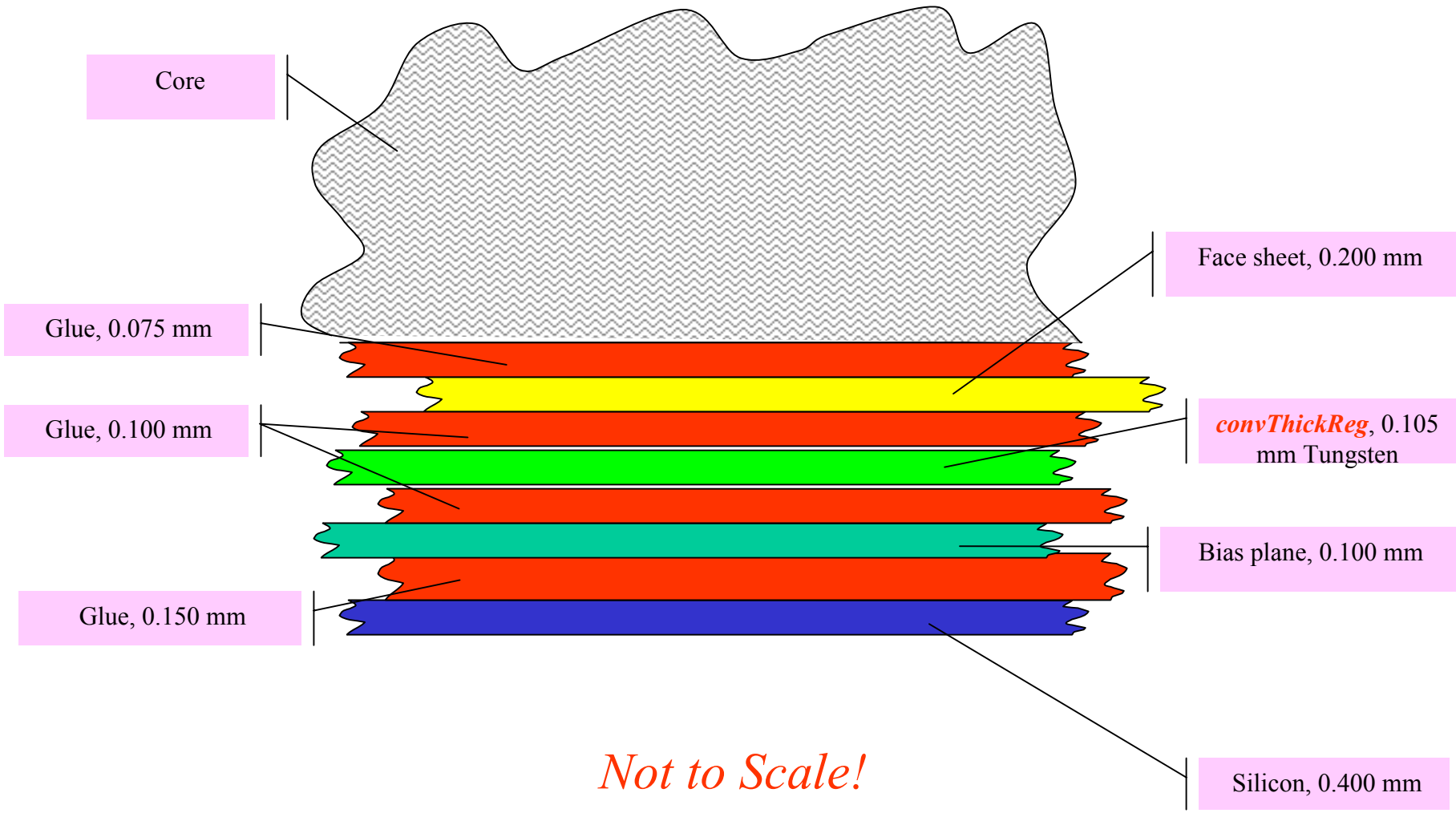
Detail of Strips on Wafer



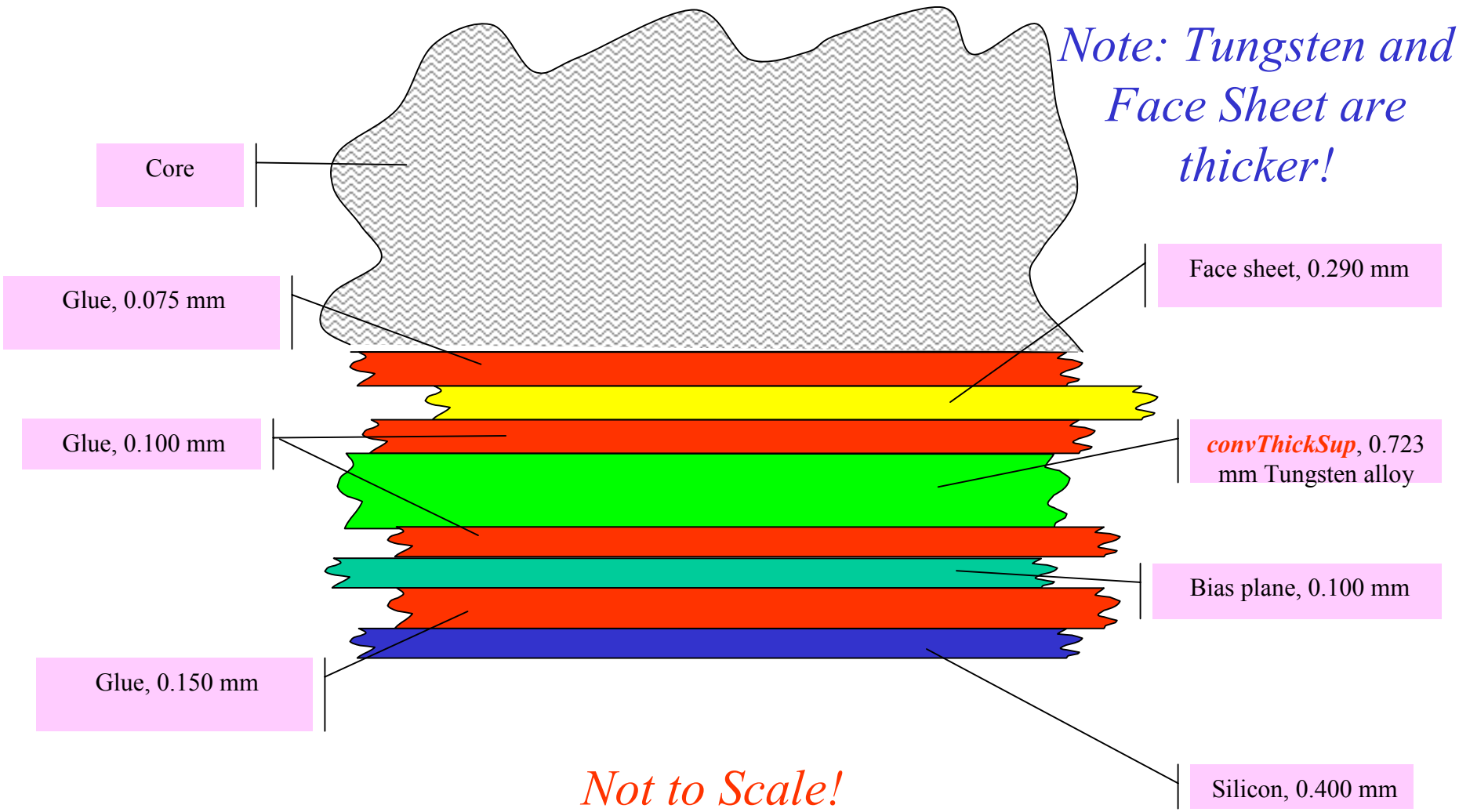
Details of Top Face of Trays
(all trays the same, except top tray)



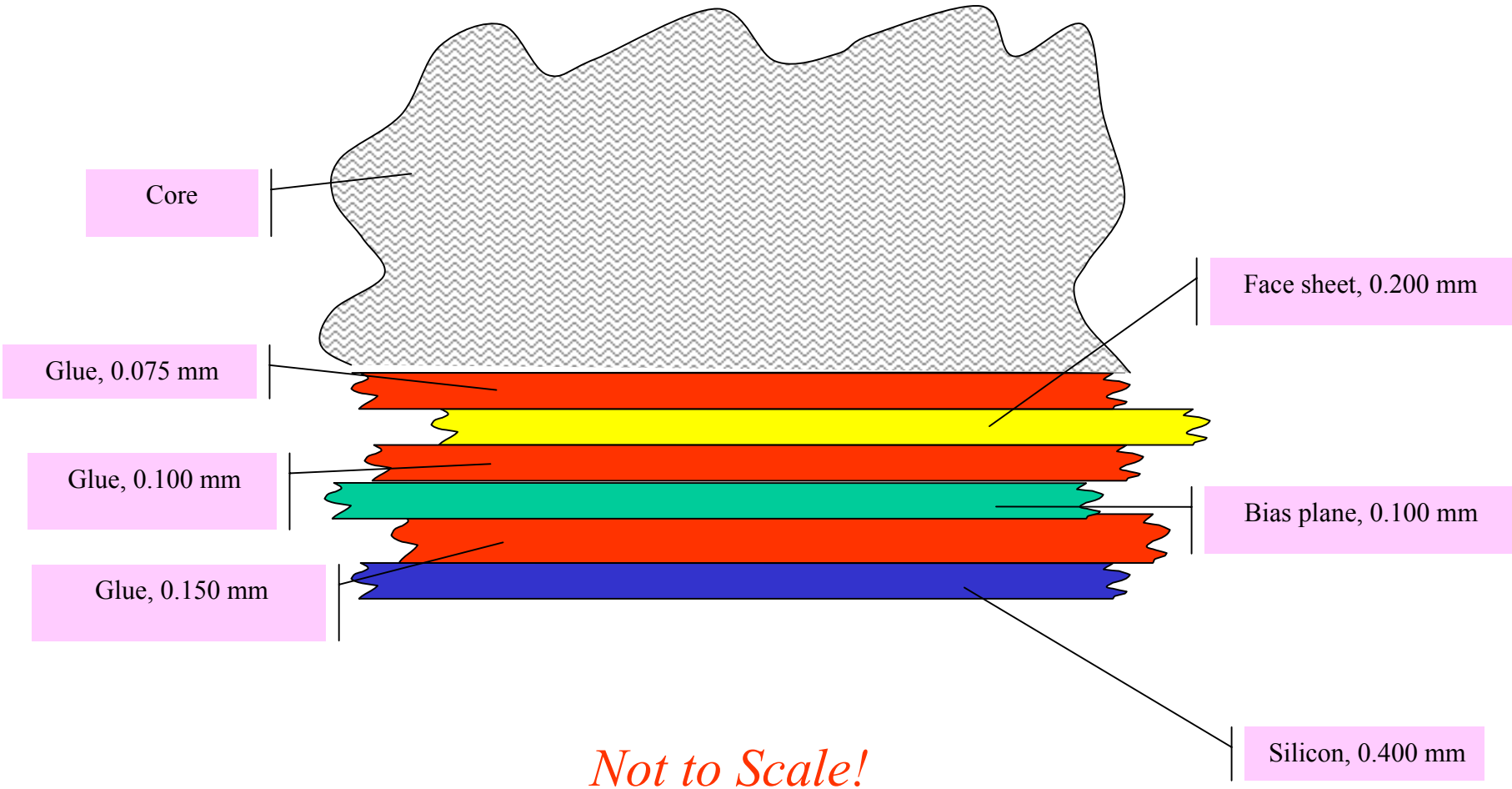
Details of Bottom Face of Standard Tray, including Bottom Face of Top Tray



Details of Bottom Face of SuperGlast Tray



Details of Bottom Face of No-Converter Tray



Not to Scale!