Interpreting Model Numbers

Click once on the list below or the logo to link to that section.

Product group:

- Standard Scintillation configurations
- **Legacy names:** Bicron®, Harshaw, Crismatec
- Liquid Scintillation Cells
- Scintillation Arrays
- SiPM integrated detectors

SCINTILLATION DETECTORS

Interpreting Scintillation Detector Model Numbers

BICRON legacy product name

- Deltaline: Scintillator encapsulated in an aluminum housing and optical window
- Monoline: Scintillator and PMT are directly and permanently coupled
- Multiline: Scintillator is coupled to one or more PMT's in a demountable assembly
- Squareline: Square or rectangular cross-sections of variable lengths

In the following example, model number 2M2Q/2PSSL designates a detector with premium spectral performance incorporating a 2" diameter by 2" long scintillator, quartz light pipe, 2" diameter photomultiplier tube, stainless steel housing and integrally mounted voltage divider.

MODEL NUMBER	2	M	2		Q	/2	P	SS	L
POSITION	1	2	3	4	5	6	7	8	9

1. Scintillator diameter (or cross section) in inches

2. Detector configuration

Laboratory units with epoxy seal

R, RW, RSW: Deltaline, with end well, with side well
M, MW, MSW: Monoline, with end well, with side well
H, HW, HSW: Multiline/Squareline, with end well, with side well
XM: X-ray detector with Monoline construction
XR: X-ray detector with Deltaline construction
HG: All-welded squareline with glass-to-metal seal

All-welded, ruggedized units

F, G, SG: Geoline
MWD: SG with integral PMT
MWD-XR:-XR signifies counts under vibration specification

NP: Thermal Neutron probe

Liquid Cells

VB-1:Glass vertical, 1PMT port
HB-1,2:Glass, horizontal, 1 or 2 PMT ports
TPB-1.2:Glass, two position, 1 or 2 PMT ports
MVB-1:Metal, vertical, 1 PMT port
MAB-1F:Metal, any position, mounting flange, 1 PMT port
MAB-2F:Metal, any position, mounting flange, 2 PMT ports
MTP-1:Metal, 2 position, 1 PMT port
FNS:Fusion neutron spectrometer

3. Scintillator length in inches

4. Scintillator material if different from NaI(Tl)

5. Type of light pipe (if used)
P: Pure NaI
Q: Quartz

6. Size of photosensitive device in inches (number used given in parentheses)

7. P indicates premium spectral performance

8. Housing material (other than aluminum)
SS: Stainless Steel
C: Copper

Radiation entrance window material for X-ray detectors
A: Aluminum
B: Beryllium

9. Integral electronic components (if incorporated)
L: Low background voltage divider
LP: Low background voltage divider with preamp

Note: – X at the end of a model number indicates a non-standard, special or custom configuration.

If the detector contains an LED or Source (Am-241), it will be added at the end of the model number.

*Standard, "off-the-shelf" detectors come with aluminum housings and epoxy seals. Standard detectors are designed for operation in a "laboratory" environment.

Monolines, Multiline and Squarelines are supplied with bialkali photocathode PMTs (for blue emitting scintillators), positive (+) high voltage operation, and phenolic tube bases.

CRISMATEC

CRISMATEC legacy product name:

Scintibloc: Scintillator and the PMT are directly and permanently coupled
Scintiflex: Scintillator is coupled to one or more PMT's in a demountable assembly

In the following example, model number 51SE51 designates a Scintibloc detector incorporating a 2" diameter by 2" long scintillator, photomultiplier tube and integrated voltage divider.

51	S	E	51
1	2	3	4

1	Scintillator diameter (or cross section) in millimeters
2	Detector configuration S: Scintibloc Y: Scintiflex
3	other characteristics of the Scintibloc and Scintiflex B: Beryllium window M: MiB window P: Axial (end) well crystal Pt: Transversal (side) well crystal E: Electronics: voltage divider incorporated A: Electronics: preamplifier incorporated F: Selected for low background Q: PMT with silica glass window L: Flexible light guide W: Phoswich assembly R: Ruggedized assembly T: High temperature unit S: Crystal equipped with radioactive stabilization source
4	Scintillator length in millimeters

Model N51X51/C designates a standard detector consisting of a NaI(Tl) crystal surrounded by a reflective material and canned in aluminum with an optical window.

N	51	x	51	/C
1	2		3	4

1	Standard detectors N: NaI(TL) C: CsI(Tl)
2	Scintillator diameter in millimeters
3	Scintillator length in millimeters
4	Other characteristics C: Collared detector P: Well detector B: Beryllium entrance window RT: High temperature ruggedized detector

Harshaw

In the following example, model number 8S8/2A-LBX designates a detector incorporating a 2" diameter by 2" long scintillator, 2" diameter photomultiplier tube, LED and non-standard.

8	S	8	/2	A	L	X
1	2	3	4	5	6	7

1. Divide number by 4 to get the scintillator diameter (or cross section) in inches
2. Detector configuration
   - D: Crystal, housing and optical window
   - A: D style with flange
   - AW: A style with end well
   - AF: A style with side well
   - S: Crystal with PMT*
   - SH: X-ray detector with S construction
   - SF: D style with end well
   - SAF: D style with side well
3. Divide number by 4 to get the scintillator length in inches
4. PMT size in inches
5. PMT mounting
   - A = only PMT
   - B = PMT + Voltage divider
   - G = PMT + VD + Preamplifier
6. Scintillator material if different from NaI(Tl)
   - C = CsI
   - B = BGO
   - D = Diode Unit
   - P = Plastic Scintillator
   - L = Built in LED

   V = Equipped for use in vacuum
   - Q = Quartz window
   - K = Lucite light guide
   - T = Built in thermistor
   - Am = Built in ^{241}Am pulser
   - Neg = Operated with negative high voltage

   (May list more than one)
7. X at the end of a model number indicates a non-standard, special or custom configuration

* S style detectors are supplied with bialkali photocathode PMTs (for blue emitting scintillators), positive (+) high voltage operation, and phenolic tube bases.

M	500	M	4	B	S	16	/3	B	Q	X
1	2	3	4	5	6	7	8	9	10	11

1. Millimeters
2. Scintillator diameter in millimeters

3+5 Matched window line (MB)

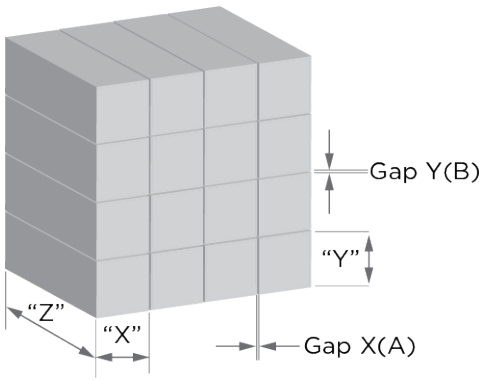
4. Number of PMT's
6. Housing Material if not aluminum
   - S = Stainless Steel
   - C = Copper
7. Divide number by 4 to get the scintillator length in inches
8. PMT size in inches
9. PMT mounting
   - A = only PMT
   - B = PMT + Voltage divider
   - G = PMT + VD + Preamplifier
10. Scintillator material if different from NaI(Tl)
    - C = CsI
    - B = BGO
    - D = Diode Unit
    - P = Plastic Scintillator
    - L = Built in LED

    V = Equipped for use in vacuum
    - Q = Quartz window
    - K = Lucite light guide
    - T = Built in thermistor
    - Am = Built in ^{241}Am pulser
    - Neg = Operated with negative high voltage

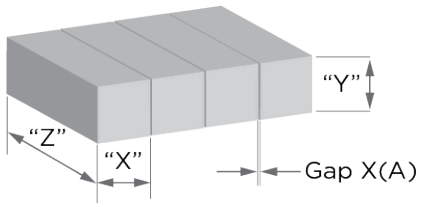
    (May list more than one)
11. X at the end of a model number indicates a non-standard, special or custom configuration

SCINTILLATION ARRAYS

		1D Array	2D Array
	Example of a Model Number	**82.58X4.2A30/16/5.2CsI(Tl)**	**82.58X4.2A30/16x4/5.2x4CsI(Tl)**
1	Active area length	82.58	82.58
2	Active area height	4.175	4.175
3	X-ray crystal depth (Z)	30	30
4	Number of pixels If the array is 2D, this is in the format [ChannelsX]x[ChannelsY].	16	16x4
5	Pitch [X + Gap X(A)] If the array is 2D AND the pitch is different in X and Y, this is in the format [X+GapX(A)]x[Y+GapY(B)].	5.2	5.2x4
6	Scintillator	CsI(Tl)	CsI(Tl)
Note: All dimensions in mm			



Dimensions to consider in the design of a 2D array



Dimensions to consider in the design of a linear array

Interpreting Historical Array Model Numbers

NaI(Tl), BGO, LaBr and LYSO Arrays

4	X	4	P	.236	B380	/.118
1	2	3	4	5	6	7

1	Scintillator length in inches
2	Space
3	Scintillator width in inches
4	Pixellated crystal
5	Scintillator thickness in inches
6	Scintillator type other than NaI(Tl)
7	Pixel size in inches

CsI and CdWO4 Arrays

2.7	X	.082	A	.081	/32	/.083	CsI
1	2	3	4	5	6	7	8

1	Array length in inches
2	Space
3	Array width in inches
4	Crystal Array
5	Pixel thickness in inches
6	Number of Pixels
7	Pitch in inches
8	Scintillator material

Detectors Integrated with SiPM

Example Model	1	2	3	4	5	6	7	8
Si50.8x101.6NL101.6D85	Si	50.8	101.6	NL	101.6	D		85
Si50.8NI50.8BW85	Si	50.8		NI	50.8	B	W	85
Si50.8NI50.8B75	Si	50.8		NI	50.8	B		75

1. **SiPM based**
2. **Diameter or Length (mm)**
3. **Width (mm)**
   absence indicates cylindrical geometry
4. **Scintillator**
5. **Height (mm)**
6. **Electronics**
7. **Special feature**
8. **Specified Max PHR**

If any placeholder is blank, then that particular set does not apply to the model in question.

4 CODE	Scintillator
NI	NaI(Tl)
NL	NaIL
CB	CLLB
BE	Enhanced LaBr
BL	$LaBr_3$

6 CODE	Electronics	7 CODE	Special	8 CODE	Resolution of Cs-137
B	Analog, CS, P	W	Well	85	≤8.5%
D	Analog, I-V, P	X	Other	75	≤7.5%

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