

# X-RAY Windows



## Applications

### X-ray Detectors

- Si(Li) Detectors
- Si-PIN Detectors
- Silicon Drift Detectors (SDD)

The transmission of light element energies through the AP3.3 and AP3.7 windows is given in the table below:

Atomic Number	Element	Transmission ( $K\alpha$ ) (% of maximum)	
		AP3.3	AP3.7
14	Si	74%	70%
13	Al	75%	72%
11	Na	69%	62%
9	F	54%	38%
8	O	47%	47%
7	N	31%	13%
6	C	47%	33%
5	B	29%	11%
4	Be	9%	1%

## AP3 Windows

### Ultra-thin Polymer X-ray Windows

AP3 ultra-thin polymer windows are the highest performing x-ray windows available for low energy x-ray analysis. AP3 windows are ideal for applications that require high x-ray transmission of light element energies, high mechanical strength, light rejection, vacuum tightness, and reliability.

#### Features

Ultra-thin polymer window  
Silicon support structure  
UV, IR, and visible light rejection  
DuraCoat™  
Uniform thickness  
High purity

#### Benefits

High transmission of low energies  
High mechanical strength, durable  
Low detector noise  
Chemical resistant, hermetic seal  
Uniform transmission  
Low spectral contamination

### Window Composition

AP3 windows are composed of ultra-thin layers of MOXTEK polymer, DuraCoat™, and aluminum. AP3 windows are supported by a silicon support structure which is attached to a metal mount.

### X-Ray Transmission

AP3.3 windows are used in applications that require the highest transmission of low energy x-rays. AP3.7 windows are used in applications where maximum light element sensitivity is not required. Both of these windows are used in applications where conventional beryllium windows are ineffective.

### Light Rejection and Vacuum Tightness

AP3 windows provide excellent rejection of UV, IR, and visible light. AP3 windows also provide a hermetic barrier to gases. Every window is tested and is guaranteed to have a leak rate of less than  $5 \times 10^{-10}$  mbar L/sec of helium.

### Mechanical Strength

AP3 windows are supported by a rigid silicon grid with 77% open area. This patented window design enables the window to withstand over 1.3 atmospheres of differential pressure. AP3 windows have survived over 100,000 cycles at a differential pressure of 1.2 atm without degradation in window performance.

### Corrosion Resistant

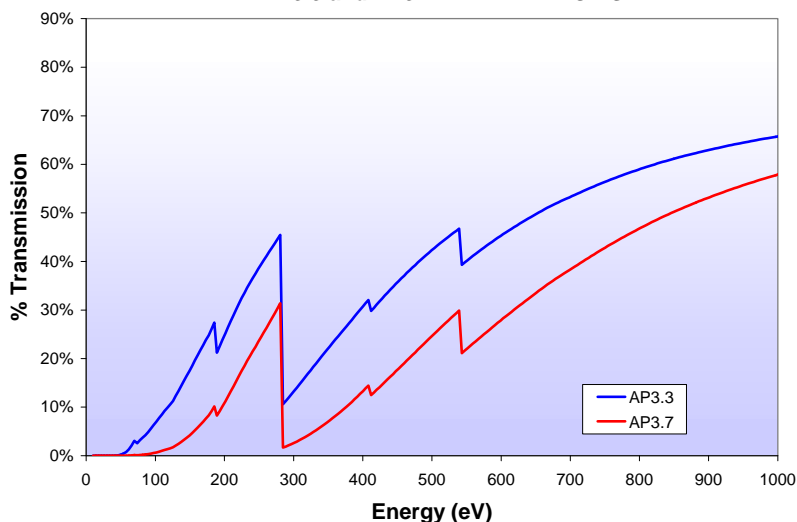
The proprietary MOXTEK DuraCoat™ treatment enables the AP3 window to withstand hostile environments. DuraCoat provides exceptional corrosion resistance in 100% humidity.



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**X-Ray Transmission, Film + Grid**  
AP3.3 and AP3.7 X-RAY WINDOWS



## Standard Window Sizes

Common window sizes available are shown in the following table. Windows can be custom fabricated.

Part Number	Active Area (mm <sup>2</sup> )	ID (mm)	OD (mm)	Support Thickness (mm)
<b>Window and mount are circular and concentric</b>				
SWN00367	10	3.6	7.9	0.38
SWN00373	16	4.6	6.6	0.38
SWN00309	18	4.8	9.4	0.38
SWN00357	25	5.6	7.9	0.38
SWN00366	32	6.4	9.1	0.38
SWN00342	32	6.4	9.9	0.38
SWN00307	32	6.4	10.7	0.38
SWN00356	49	7.9	12.2	0.38
SWN00315	82	10.2	14.0	0.76
SWN00322	99	11.2	17.8	0.76
<b>Circular window is off-centered in a circular mount</b>				
SWN00343	20	5.1	8.4	0.38

Part Number	Active Area (mm <sup>2</sup> )	Window Diameter (mm)	Mount l x w (mm)	Support Thickness (mm)
<b>Circular window is centered in a rectangular mount</b>				
SWN00429	6.2	2.8	4.2 x 5.6	0.38
SWN00368	10.2	3.6	5.3 x 7.4	0.38

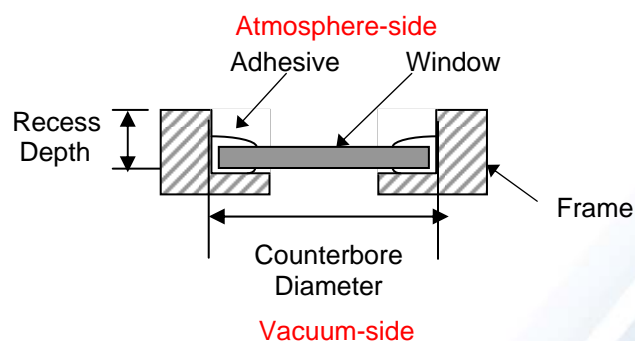
## Window Specifications

Parameter	Specification
Open Area	77%
He Leak Rate	<5x10 <sup>-10</sup> mbarL/sec
Maximum Temperature (1 atm Differential)	40°C
Maximum Temperature (Zero Pressure Differential)	70°C
Front Burst Pressure Limit	2 atm
Back-Pressure Tolerance	1 atm
Minimum energy transmission	Be(K <sub>α</sub> )

## Mounting

AP3 windows are bonded to a metal frame. Frames may be supplied or machined by MOXTEK. The preferred frame material is stainless steel 316 or other hard alloy. Aluminum can be used as an alternative. A drawing should be supplied that illustrates the orientation of the window support structure with respect to the metal frame.

AP3 windows are mounted using vacuum compatible adhesive. The window should be recessed slightly from the face of the frame. A minimum recess depth of 1.5 mm is required. The counterbore diameter needs to be 1mm greater than the OD of the window. The through-hole diameter should match the ID of the window.



## Warranty

Contact MOXTEK for warranty related questions or go to our website: [www.moxtek.com/warranty.html](http://www.moxtek.com/warranty.html).

## Ordering Information

Please contact MOXTEK for price and delivery information.

AP3 windows are also available through EDXRF and EDS system manufacturers.



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