

X-RAY Windows

Guidelines for Designing a Frame for DuraBeryllium X-Ray Windows (Technical Note)

Introduction

MOXTEK DuraBeryllium windows are the highest performing beryllium windows available.

DuraBeryllium windows have high x-ray transmission, are vacuum tight and corrosion resistant. MOXTEK Beryllium windows are used in a variety of applications including *microanalysis*, *EDXRF*, *WDXRF* and *XRD*.

This Technical Note provides general guidelines for designing frames for MOXTEK Beryllium windows.

Mounting

MOXTEK offers a mounting service for DuraBeryllium windows.

Two types of bonding are used for mounting Beryllium windows:

1. Polymeric adhesive
2. Metal bond

Please contact MOXTEK to discuss requirements for active area, differential pressure, and x-ray transmission.



Figure 1. Custom Designed and mounted
DuraBeryllium X-ray Windows

Table 1. Standard Foil Sizes

Thickness (μm)	Diameter (mm)
8.0	4.9
8.0	5.7
8.0	7.9
8.0	9.2
8.0	12.0
12.5	12.0
12.5	16.0
25.0	16.0

Please contact MOXTEK for custom sizes.



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Adhesive Mounting

Typical adhesive attachment of MOXTEK Beryllium Windows is shown in Figure 2.

For metal bonding, please contact MOXTEK.

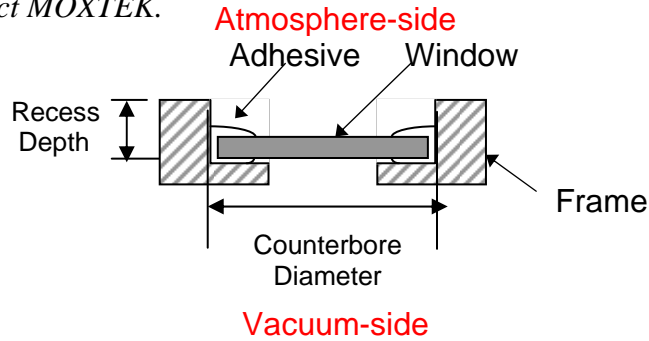
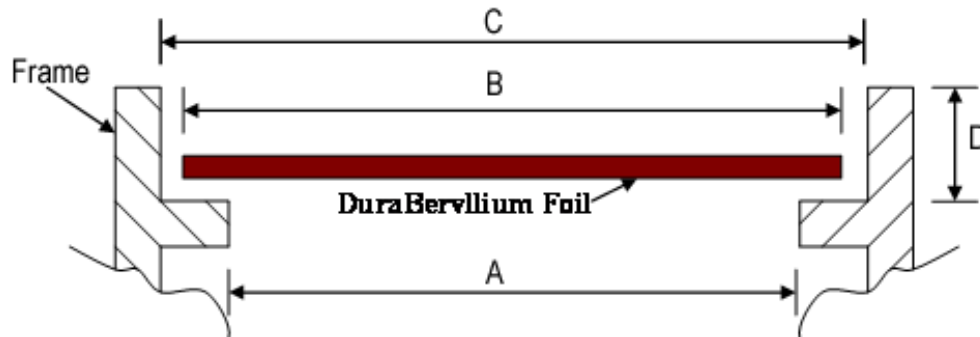


Figure 2. Typical Adhesive Attachment of Beryllium Window

Frame Design

Guidelines for design of the window frame are shown in Figure 3. Calculated values for aperture, standard DuraBeryllium foil and total counterbore diameter of the frame are shown in Table 2.

For Non-Standard frame designs please use the formula shown below.



Where:

A (aperture) = Customer Specified Value

B (foil diameter) = A + 2.0mm

C (counterbore diameter) = B + 1.0mm

D (counterbore depth) ≥ 1.0mm

Figure 3. Geometry Requirements for Window Counterbore



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Table 2. Calculated Values for Designing Frames for Standard Foil Sizes

Foil Outer Diameter (mm) - B	Aperture Diameter (mm) - A	Counterbore Diameter (mm) - C	Counterbore Depth (mm) - D	Foil Thickness (μm)
4.9	2.9	5.9	≥ 1.0	8.0
5.7	3.7	6.7	≥ 1.0	8.0
7.9	5.9	8.9	≥ 1.0	8.0
9.2	7.2	10.2	≥ 1.0	8.0
12.0	10.0	13.0	≥ 1.0	8.0
12.0	10.0	13.0	≥ 1.0	12.5
16.0	14.0	17.0	≥ 1.0	12.5
16.0	14.0	17.0	≥ 1.0	25.0

Multiple Windows on One Frame

When mounting multiple windows onto one frame the minimum thickness of 0.5mm is required between windows (Figure 4).

The assembly provided by the customer has to be rigid to avoid damage to the window during handling.

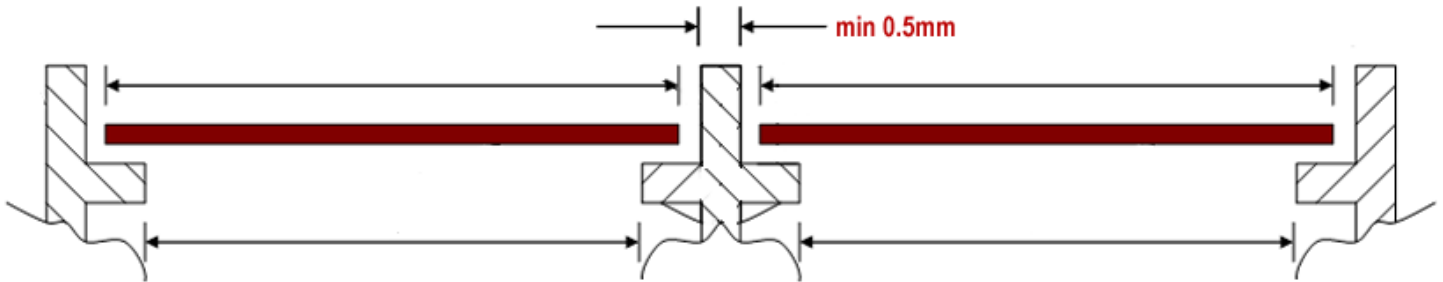


Figure 4. Geometry requirements for Multiple Windows on One Frame