Product Data Sheet ZP50-240-9
Serial # 1263.3-1

Thank you for your purchase of an Xradia zone plate optic. In this document you find the parameters and fabrication tolerances of the zone plate.

Zone Plate Parameters:

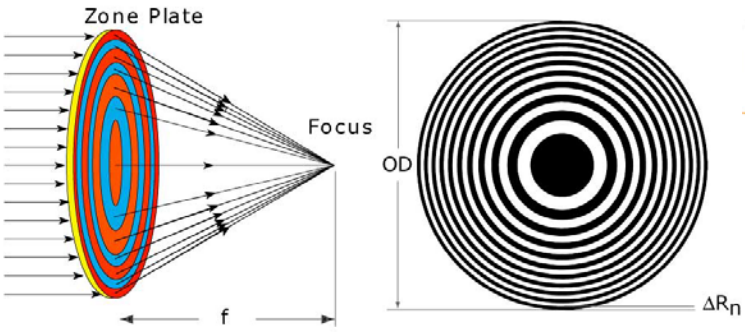
Outer Diameter	µm	240
Inner Diameter (no zones)	µm	N/A
Outermost Zone Width	nm	50
Zone Material		Electroplated Gold
Zone Height	nm	900 +/- 8%
Number Of Zones[2]		1200
Suggested Energy Range[3]	keV	5-24
Theoretical Max. Diffraction Efficiency[1]	%	17 (@ 9 keV)
Support Membrane Material		Si_3N_4
Support Membrane Thickness	µm	0.3
Support Membrane Size	mm	0.5 x 0.5
Support Silicon Frame Size	mm	2 x 2 x 0.18
Central Stop Diameter[4]	µm	80
Central Stop Height / Material	µm	85 / Au

[1] Xradia delivers zone plates with a focusing efficiency exceeding 50% of the theoretically calculated value.
[2] Number of fabricated rings calculated for a full zone plate (no missing inner zones).
[3] Energy range for which the theoretical efficiency is greater 10%.
[4] The placement accuracy of the stop is 10µm (typical 5 µm).

Zone Plate Focal Length

The focal length of the zone plate is given by:

$$f = \frac{OD\,\Delta R_n}{\lambda} = \frac{12.0\,\text{mm}}{\lambda\ [\text{nm}]} = 9.678\,\text{mm}\ gE\,[\text{keV}]$$



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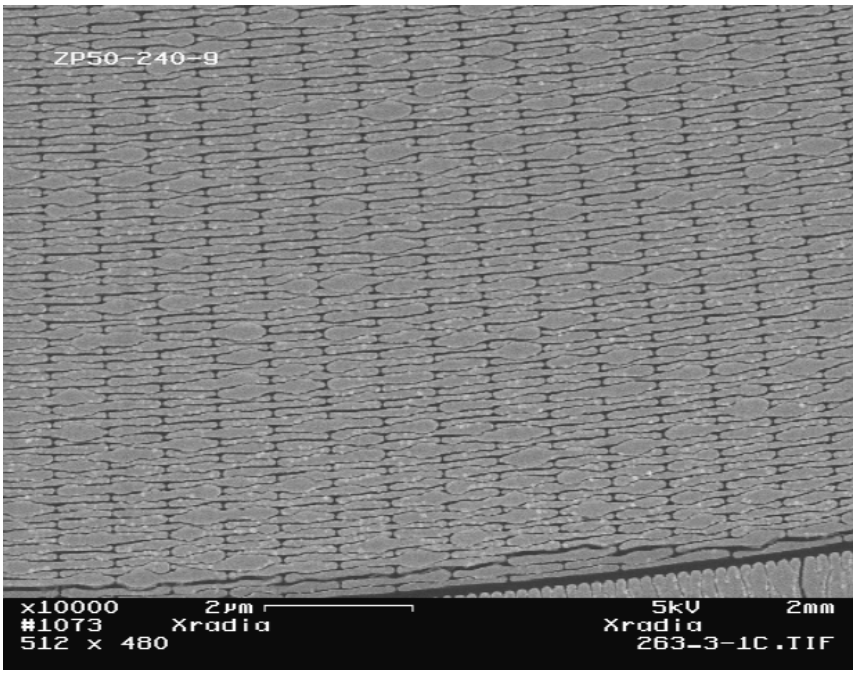
Use In Vacuum

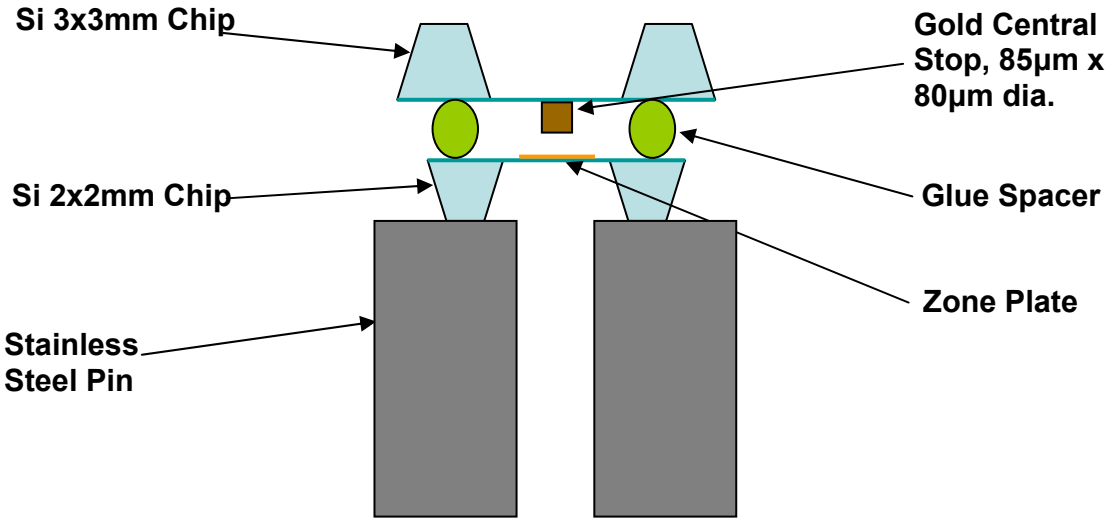
Zone plates can be used in vacuum. Several precautions need to be taken:

- No pressure differential can be applied between both sides of the zone plate wafer.
- Change the ambient pressure slowly. Avoid shocks generated by opening large conductance pneumatic valves.
- Zone plates can be damaged by ultra-sonic particles generated during venting of the vacuum system. Vent slowly and with a clean gas (use filter if possible). Avoid venting through a port which is in direct line-of-sight of the zone plate. Install a shield if necessary.
- Make sure that the zone plate heat load is small and removed through proper thermal connections. If in doubt, consult Xradia for advice.

SEM Micrograph

Outermost zones of the zone plate





Zone Plate Mounting Diagram

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