

Argonne Tile Production Facility: What we will produce

1st Argonne Tile Facility Workshop
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Tile Production Facility Project Scope

Objectives:

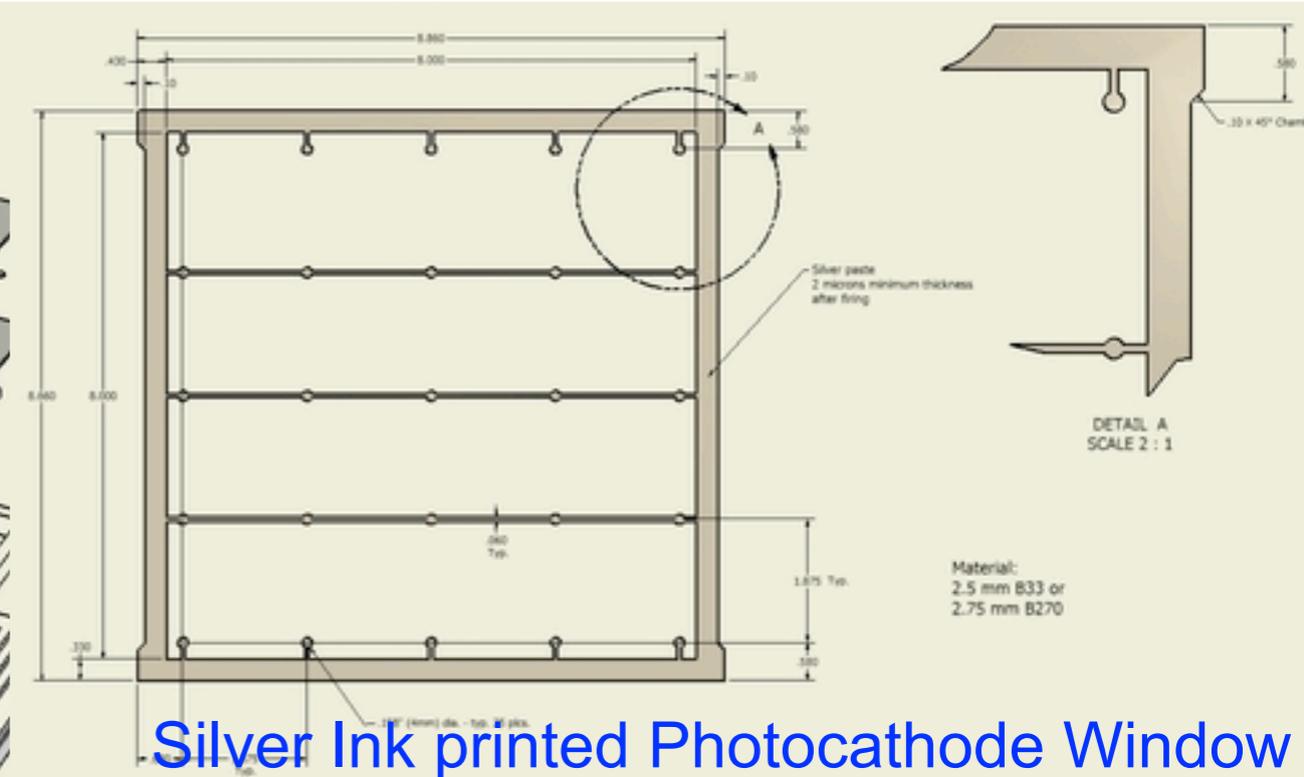
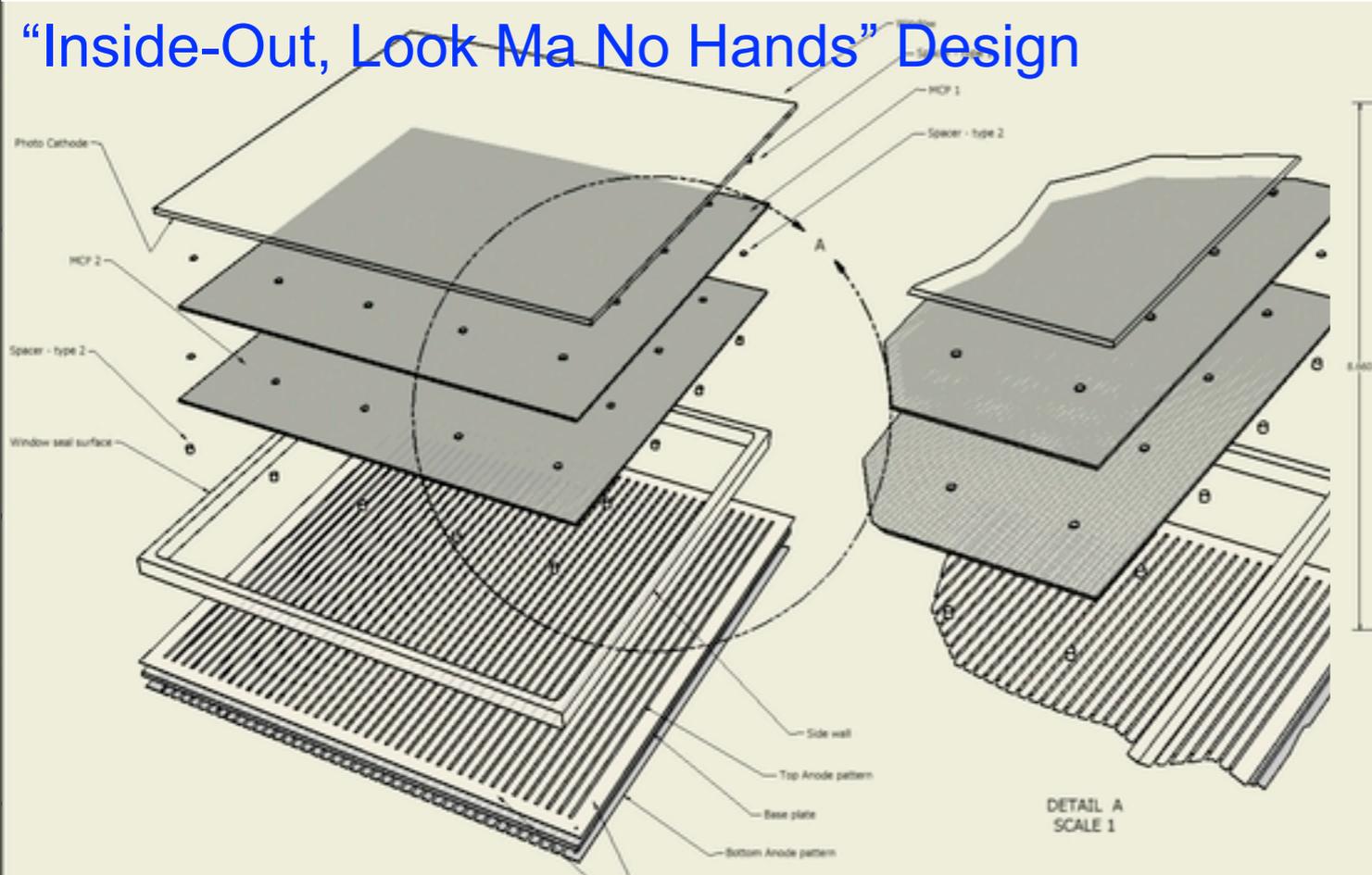
- ▶ Produce Large Area MCP Photodetectors of the all-glass frugal design in quantity (SuperModule-based design)
- ▶ Understand, develop, and refine process control, yield, and system parameters
- ▶ Reliably produce 6 tiles per week; instruments one SuperModule
- ▶ Avoid clean room environment through use of insert gas and vacuum transfer modules.
 - Cleanliness of parts is of **fundamental** importance!!!
 - Once cleaned, parts will not be exposed to normal atmosphere until completed tile exits UHV fabrication chamber



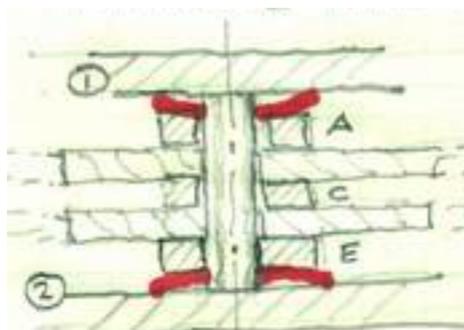
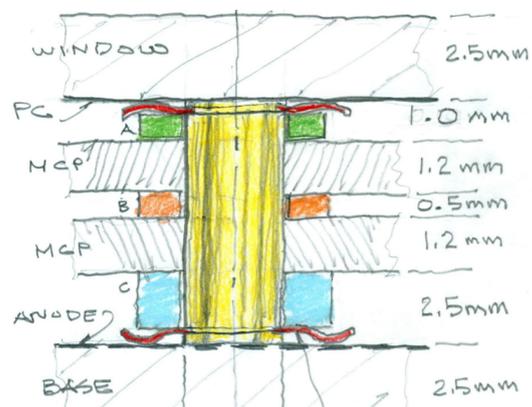
Tile Production Facility Project Scope (2)

Components: (drawings credit: Rich Northrop)

“Inside-Out, Look Ma No Hands” Design

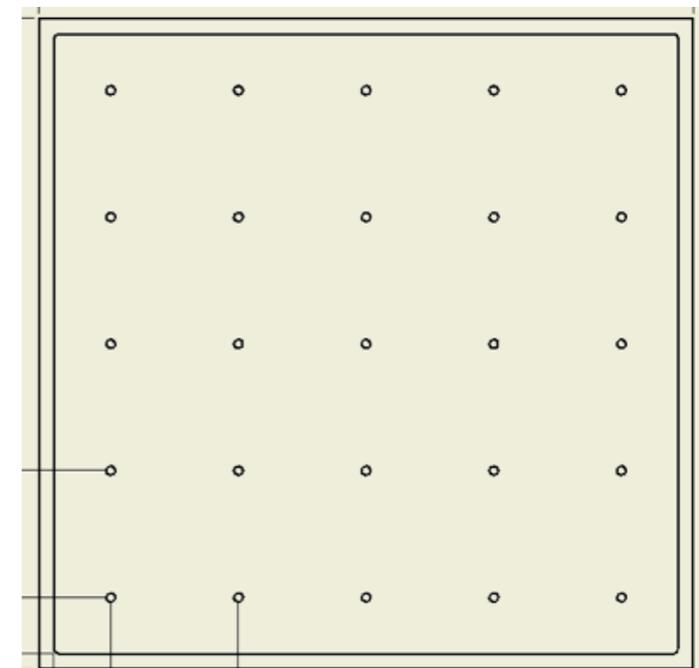


Silver Ink printed Photocathode Window



Pin, Collar, and Spring Clip Spacer

Green, Orange, Cyan have low resistance coating for HV transmission.
 Yellow pin must have high resistance
 All parts exposed to ALD resistive and emissive coatings



Glass Capillary MCP -- holes drilled during production at Incom



Summary of Component Arrivals

- ▶ Top and bottom windows silver ink printed (Cat-i Glass)
- ▶ Sidewall with metallized coating for indium top seal
- ▶ Tile bases (Anode bottom plate + Sidewall) glass frit bonded by Joe Gregar at Argonne Glass Shop.
- ▶ Glass capillary MCP substrates nichrome evaporatively electroded at Fermilab Thin Film Facility
- ▶ Spacer collars with low resistance pre-coating at Argonne ALD Labs
- ▶ MCP Pairs & Spacers pre-assembled, cleaned, ALD resistive and emissive coatings at Argonne ALD Labs
- ▶ All parts cleaned in wet chemistry area of Tile Production Facility and transferred to insert gas or UHV transport
- ▶ Bialkali Photocathode deposited in UHV Assembly Chamber
- ▶ Cold/Warm Indium Pressure seal of Photocathode window to sidewall
 - Top plate mating surface is silver ink if feasible
 - Sidewall mating surface is silver ink printed if feasible
 - Chromium surface as fallback