

PROJECT OBJECTIVES

Goals:

- Develop and prove new methods for rapidly shaping glass mirrors and coating them for high reflectivity and soil resistance.
- Shaping method to allow for point-focus as well as line-focus.
- Performance objectives:
 - Reflector surface accuracy of 2mR RMS.
 - Reflectivity of 95%.
 - 40% cost reduction for sustained high volume production.

Innovation:

- Novel molding method advances state of art in surface accuracy.
- Advanced fast thermal cycle.

Milestones:

- * Full-size (1.63 m) glass test samples to be made to spec. in new fast shaping furnace by end of first year

APPROACH

Overall approach for 2-year program:

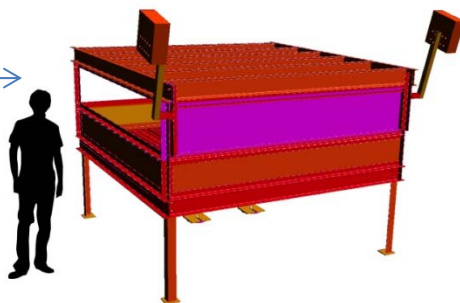
- Slump 20 full sized panels, coated with anti-soil and dielectric coatings and measure reflectance prior to deploying in the field.
- Measure panel reflectance degradation of field samples over time.

Technical approach during the 2nd Quarter:

- Validate furnace thermal model and glass shaping cycle with 1/5th scale test furnace.
- Improve mold design for accurate replication in fast cycle, non-equilibrium conditions.
- Improved mold thermal control with heaters and forced convection from below.
- Add external adjustable supports to the mold to correct for low order thermal distortion and steel creep.

KEY RESULTS AND OUTCOMES

- Design for improved mold validated through FEA, thermal analysis and experiment.
- Full furnace design completed. →
- 1/5th scale model furnace with prototype heater panel up and running.
- Longevity testing of first furnace panel successfully completed
- 1/5th scale glass replicas slumped with 210 second heating interval - surface slope accuracy spec. exceeded
- Order placed for rolled mold plate.



NEXT MILESTONES

Mold

- Manufacturing plan reviewed and accepted.
- Mold plate machined and accepted.
- Mold assembly including flexures and supports complete.

Furnace

- Assemble furnace lid, walls and base and begin full scale testing.
 - Furnace detail design complete and accepted.
 - Furnace panels manufactured and assembled.
 - Controller and software assembled and tested.

Coatings

- Subscale coating and testing initiated.

Metrology

- Begin metrology system testing.