


Advanced Manufacture of Reflectors

THE UNIVERSITY OF ARIZONA 	
PROGRAM:	SunShot CSP R&D 2012
TOPIC:	Advanced Collectors
LOCATION:	Tucson, Arizona
AWARD AMOUNT:	Up to \$1.5 million
PROJECT TERM:	2012–2014



Principal investigator Dr. Roger Angel evaluates a self-supporting second-surface glass reflector made by the new molding process. *Photo by The University of Arizona*

CONTACTS

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Partnering Organizations:

- Rioglass Solar, S.A
- Glasstech, Inc.

MOTIVATION

Most state-of-the-art reflectors use second-surface silvered glass mirrors carried by lightweight framework structures that track the sun. Though life spans of more than 20 years are already established for this technology, improved manufacturing processes are needed to make reflectors of higher accuracy and in a greater variety of shapes, and to reduce costs of very high-volume production, in line with SunShot targets.

PROJECT DESCRIPTION

The research team is working to develop a novel method for shaping float glass. The process involves softening and slumping the glass into a full-body mold. To preserve the original high polish of the glass on both front and back surfaces, the high-accuracy mold surface is machined to minimize contact while still yielding the required shape. A new mold with higher accuracy is being obtained for this project. In parallel, the team is boosting short wavelength reflectivity and inhibiting soiling through the use of advanced coatings. This boosting method has already yielded 95% reflectivity in samples made with glass of very low iron content thus reducing weight.

IMPACT

The rapid heating and cooling technique developed by this research team can reduce the time required for the shaping step from more than 5 hours to about 200 seconds. By enabling mass production of solar concentrating mirrors at high speed, this project should lead to improved performance and as much as a 40% reduction in manufacturing costs for reflectors made in very high volume.

For more information, visit the project page at: www.solar.energy.gov/sunshot/csp_sunshotrnd_arizona.html.