



# SkyFuel Parabolic Trough Optical Efficiency Testing

Cooperative Research and Development  
Final Report

**CRADA Number: CRD-08-00266**

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*CRADA Report*  
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## Cooperative Research and Development Final Report

In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: CRD-08-00266

CRADA Title: SkyFuel Parabolic Trough Optical Efficiency Testing

Parties to the Agreement: SkyFuel, Inc. – SkyWorks R&D + NREL

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	NREL Shared Resources
Equipment Value	\$ 10,000
Technical Support	\$ 40,000
TOTALS	\$ 50,000

Abstract of CRADA work:

SkyFuel and NREL collaborated on the method of mounting SkyFuel's parabolic trough(s) on NREL's existing two-axis tracker system at SIMTA. NREL will made available to SkyFuel existing mounting components from previous trough tests.. SkyFuel delivered their parabolic trough ready for mounting on NREL's tracker, using new and used mounting components. SkyFuel provided appropriate fluid connections on their trough's receiver tube to mate to NREL's coolant supply and return hoses. SkyFuel provided a crane service, approved by NREL ESH&Q, that placed and fastened the trough to NREL's tracker, which the work plan was approved by NREL ESH&Q. NREL performed testing of SkyFuel's trough in collaboration with SkyFuel. The testing occurred over a period of a number of months that captured the effect of varying weather conditions on performance. At the end of the test program, SkyFuel coordinated with NREL to remove their trough and return NREL's mounting components.

Summary of Research Results:

Tested parabolic trough products provided by SkyFuel, a manufacturer of parabolic trough systems in the concentrating solar thermal power industry. The testing evaluated the performance of the system at the Optical Efficiency Test Loop at Solar Industrial Mesa Top Area. The trough(s) were mounted on a

two-axis tracker and the receiver tube was supplied with coolant at near ambient temperature. The heat gain of the coolant was compared to the direct normal incident solar radiation that determined efficiency of the trough system at low temperature. The measured optical efficiency was between 77 and 78%, a very high level and among the highest efficiency levels recorded in the parabolic trough solar industry.

Subject Inventions listing: None.

Report Date: 4/30/10      Responsible Technical Contact at Alliance/NREL: Gawlik, Keith

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