



Assessment Date:  
June 8<sup>th</sup> & 9<sup>th</sup>, 2006

#### Benefits:

- Implemented 4 of 6 recommendations
- Recommendations have the potential to reduce natural gas consumption by 23% per year.
- Recommendations identified over \$700K in total energy savings.
- Can achieve paybacks between 0 and 0.7 years.

#### Applications:

Superior Graphite assessment team discovered opportunities to decrease energy usage and increase productivity, thereby increasing capacity, improving product quality, and enhancing corporate competitiveness. In order to decrease energy usage and increase productivity, the assessment team focused primarily on increasing the efficiency of the equipments, such as lights, ovens and compressed air systems, used by the manufacturing company. The results at Superior Graphite will guide energy assessments at similar facilities where the savings can be replicated.

## Superior Graphite: Recommendation Increases Worker Safety and Saves Big Through Baking Oven Re-insulation.



### Summary

Superior Graphite is a world leader in developing and manufacturing carbon and graphite products. The Russellville Arkansas Plant supports metal melting, ladle, and furnace applications worldwide. The **Oklahoma State University Industrial Assessment Center** worked with Superior Graphite to help reduce its energy demand and costs. Results include annual savings of over one-quarter of a million dollars.

### Company Background

Superior Graphite produces a broad range of engineered carbon-based products to service a wide range of industrial applications around the world. Superior Graphite specializes in high temperature technologies, advanced sizing, blending, and coating technologies, providing the highest value graphite and carbon product solutions.

The Electrode Research Center at the Russellville, Arkansas, USA Laboratory supports the production of ARK<sup>®</sup> Electrodes and other extruded and/or heat treated carbon and graphite products. Activities include new product and process developments leveraging Superior Graphite's knowledge with pitch bonding/impregnation, batch heat-treating and continuous-graphitization technologies.

Since 1984 Superior Graphite has been the leading producer of small diameter graphite electrodes. Superior Graphite's Russellville, Arkansas facility specializes in the production of 200 mm – 400 mm (8" - 16") diameter high power (HP) and ultra-high power (UHP) ARK electrodes, offered in 3 TPI, 4 TPI, and male / female joining systems. Specializing in the small diameter market enables Superior Graphite to focus its years of experience of graphite manufacturing knowledge toward its customer's applications: primary melting, ladle metallurgy, and specialty furnace applications worldwide.

Superior Graphite utilizes unique, continuous in-line graphitization furnaces allowing it to assure consistent, uniform properties throughout the entire electrode.



## Notable Observations

Superior Graphite (Russellville, AR) has over 3,000 horsepower in electric motors and over 600 horsepower in compressed air equipment. In total, it has over 4,500 kW of electric demand and consumes over 37 million kWh of electricity and about 400,000 MMBtu of natural gas annually.

The IAC assessment was performed in 2006. A team of students and faculty from Oklahoma State University conducted an Industrial assessment which was funded through the DoE Industrial Assessment Center Program. The team leader was Dr. William Kolarik, Director of the IAC. Team members were Scott Frazier, Wisit Kumphai, Tanay Bapat, and Wade Svetgoff. The team made extensive use of infrared measurements and imaging. The assessment was successful in identifying several energy savings recommendations.

## Results

Superior Graphite's management was pleased with the assessment. The assessment produced six recommendations. These recommendations included gas savings through additional insulation, use of waste heat, water meter management, air leak reduction, electrical system maintenance, and exterior lighting control. During the implementation report follow-up, the IAC team learned that Superior Graphite has implemented four of the six recommendations for annual savings of over a quarter of a million dollars.

*“The IAC assessment team did a very professional and thorough job in analyzing the energy-saving opportunities for our plant. Our business is extremely competitive and energy is a large component of our cost. Their efforts and our implementation of their suggestions translated into significant savings for our plant. Of their six recommendations, four were implemented with one providing large savings in energy usage. We were very pleased with the assessment and the results.”*

*- Mr. Scott Anderson , Superior Graphite*

**Table 1. Opportunities at Superior Graphite**

Recommended Action	Annual Energy Savings	Annual Cost Savings	Implementation Cost	Payback (years)
Insulate Bare Equipment	29,966 MMBtu/yr	\$224,746	\$154,440	0.7
Insulate steam/hot water lines	3,900 MMBtu/yr	\$29,250	\$20,286	0.7
Meter Recycled Water (To Reduce Sewer Charges)	N/A	\$8,438	\$765	0.1
Eliminate Leaks in Inert gas and Compressed Air Lines/Valves	234,450 kwh/yr	\$5,322	\$1,267	0.2
<b>Totals</b>	<b>33,866 MMBtu/yr 234,450 kwh/yr</b>	<b>\$267,756</b>	<b>\$176,758</b>	

FOR ADDITIONAL INFORMATION  
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A STRONG AMERICA*

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