



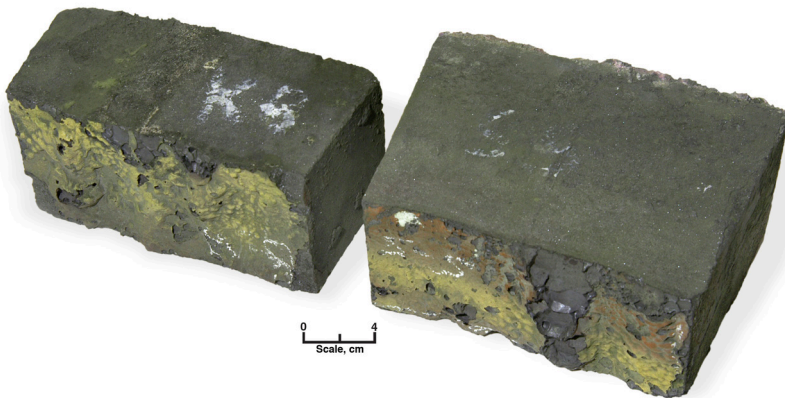
the **ENERGY** lab

R&D FACTS
Materials Science

Improved Refractory Materials for Slagging Gasification Systems

Advances in technology are often directly linked to materials development. For gasification, the reliability and affordability of slagging gasifier operation depend directly on the service life and performance of the refractory materials used to contain the high-temperature gasification reaction. The National Energy Technology Laboratory (NETL) is working with industry to develop high-performance, affordable materials for this application.

In the most severe areas of a slagging gasifier, where tons of molten slag each day flow by at temperatures in excess of 1350 °C, refractory service life can be as short as 90 days, requiring complete shutdown of the gasifier island every 3 months for material replacement. Unless there is a second gasifier available, these shutdowns result in no syngas production, and therefore no product for up to 14 days. The costs of these shutdowns, including lost opportunity costs, reach into the millions. To help address this issue, scientists at NETL developed and patented a new refractory designed specifically for longer service life in this application. Field tests of this new refractory at several commercial gasifier sites in the United States showed significantly improved performance relative to other commercially-available materials. Based on field test results, Harbison-Walker Refractory Company licensed this technology and now markets this material to the gasifier industry as Aurex®95P.



Refractories removed from adjacent positions in the gasifier. The NETL refractory has approximately 50 percent more material remaining after the test.

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