

Work At ARC Focuses on Improved Refractory for Slagging Gasifiers

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Proof-of-concept characterization of the [Albany Research Center](#)'s improved refractory for slagging gasifiers is continuing, with expanded exposure and property analyses.

Results from recent rotary kiln exposure tests predict improved performance by the ARC-developed brick, as compared with commercial brick currently used by the gasifier industry.

In the rotary kiln test, a barrel, lined with the test refractory materials, is rotated around its horizontal axis, exposing the brick to a dynamic pool of molten coal slag. The kiln is heated to a temperature of 1670° C.

Four types of high-chromium oxide refractories—three commercial materials and the ARC-developed material—were ex-



Extensive cracking seen in commercial materials.

Although the exposure conditions in the rotary kiln do not exactly mimic those found in a working gasifier, the test does simulate the same type of failure mechanisms found in spent materials removed from gasifier service.

Thus, performance in this test may be considered indicative of performance in a commercial gasifier system.

The results of these tests, along with tests of the material's mechanical and thermal stability, are being used to ensure satisfactory performance of the ARC refractory prior to placing test panels of the material in working gasifiers.

For more information on this activity, please contact [Cindy Dogan](#), [Albany Research Center](#).

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posed to this environment for a total of five hours.

Post-test evaluation of the refractory materials indicated little or no cracking in the ARC material, as compared to extensive fracture in each of the commercial materials, as shown below.

Slag penetration was also minimized in the ARC material, to less than 20% of that observed in the commercial refractories.



Little or no cracking observed in ARC-developed material.