



CASE STUDY:

METAL-ROK® Precast Shapes in the Mouth of a Peirce-Smith Converter at Copper Smelter

METAL-ROK® precast shapes significantly improved mouth performance in a Peirce-Smith Converter, extending service life from 3–6 months to an entire 14-month campaign while delivering savings of nearly USD 2 million.

Peirce-Smith Converters are used to convert matte into blister copper and are typically lined with mag-chrome brick, including in the mouth area.

This zone is exposed to severe thermal shock, abrasion, mechanical abuse, and direct contact with blister copper. As a result, the brick and/or castable in this area can suffer rapid wear and infiltration. Historically, the mouth area required frequent repairs and typically operated for 3 to 6 months before major intervention was needed.

PRODUCT

METAL-ROK® 70M is a fine, mullite-based, metallic fiber-reinforced precast refractory shape. METAL-ROK® 70M has a unique design which allows the addition of metallic reinforcing fibers at levels significantly above those used in traditional refractory castables. The finished shapes have excellent mechanical toughness and superior surface finish. METAL ROK® 70M shapes have excellent hot strength, thermal shock resistance and abrasion resistance.

INSTALLATION

The precast shapes were bolted to the steel mouth structure on the Peirce-Smith Converter. The shapes were pre-dried to 650°C (1200° F), which minimized heat-up time during installation and helped accelerate the return to operation.

RESULTS

The precast shapes completed the entire converter campaign. While the mouth previously operated for only 3 to 6 months, the improved precast shape design extended mouth life to the full 14-month campaign. No maintenance was required on the precast shapes during the campaign. In addition to improving reliability and reducing repair frequency, the installation generated savings of nearly USD 2 million yearly.



Precast shapes after drying.



Installation of precast shapes.



Peirce Smith Converter in operation and precast shapes after the campaign.

Allied Mineral Products, Inc. supplies an entire line of monolithic refractories for the metals industry. For more information or a complete evaluation of your refractory requirements, please contact your local Allied representative.

