

## ask the expert...

### CRUST BREAKERS—A REAL BREAKTHROUGH FOR SMELTERS



*Mike Davenport,  
Global Product  
Manager Potroom  
and Carbon Bake*

Mike Davenport, Pyrotek's Global Product Manager for Potroom and Carbon Bake Technologies, answers customers' questions on the nature and applications of crust breakers in electrolytic reduction cells in aluminium smelters.

**Q: What are crust breakers and how do they operate?**

A: Aluminium metal is produced in smelters by the electrolytic reduction of alumina (the compound aluminium oxide) in a molten bath solution of cryolite. This process takes place in a reduction cell or "pot" and the continuous reaction requires a predetermined amount of alumina to be added at set intervals.

During the reduction process, the molten bath freezes at the upper surface and forms a hard crust, which must be broken open to allow further alumina additions.

The "crust breaker" is a solid cylinder installed on the bottom end of the point feeder shaft, which breaks a hole in the hard crust as the feeder is activated.

**Q: What are the general areas of customer pain in using crust breakers?**

A: Smelter customers routinely experience pain in the application of crust breakers through the cost of replacing the devices due to wear as they are constantly pushed through the hard crust

and into the molten cryolite. The typical failure mode and reason for replacement is the loss of material at the pointed tip due to wear. A worn tip on the device restricts its ability to break a hole in the crust. This reduces the amount of alumina supplied to the cell, which can negatively affect production and cell life.

**Q: What extra services does Pyrotek provide to the customer?**

A: Pyrotek manufactures crust breakers and other ferrous metal components at its foundry facility in Xi'an, China. Low cost and high quality production enables us to bring value to our customers. Making routine shipments to the U.S. and operating various store locations enable us to hold inventory for quick delivery. Pyrotek also offers "just-in-time" delivery when applicable, eliminating costs for shipping and inventory, as well as headaches due to damage and loss of freight.

When considering performance, Pyrotek has supplied crust breakers since 2003 and received excellent feedback regarding their performance. Precisely machined attachment holes and long service life resulting from superior abrasion resistance offer further cost savings, process advantages and convenience for customers.

[www.pyrotek.info/crust breakers](http://www.pyrotek.info/crust%20breakers)

*By Mike Davenport, Global Product Manager,  
Potroom and Carbon Bake, Pyrotek Corporate  
Office, Spokane Valley, Washington, USA*



*Crust breakers are used in "Prebake Anode Reduction Cells" whereas Soderberg pots are not equipped with point feeders for making alumina additions.*