

# Liner change solves heat issue; improves production and wear life

**Excessive heat generation in the return oil for its cone crusher led a copper mine to contact FLSmidth. A new liner profile solved the challenge and improved the site's overall performance.**

## Results at a glance

- 30% increase in production
- Liner life doubled
- 32% increase in availability
- 18% reduction in heat generation

### Background

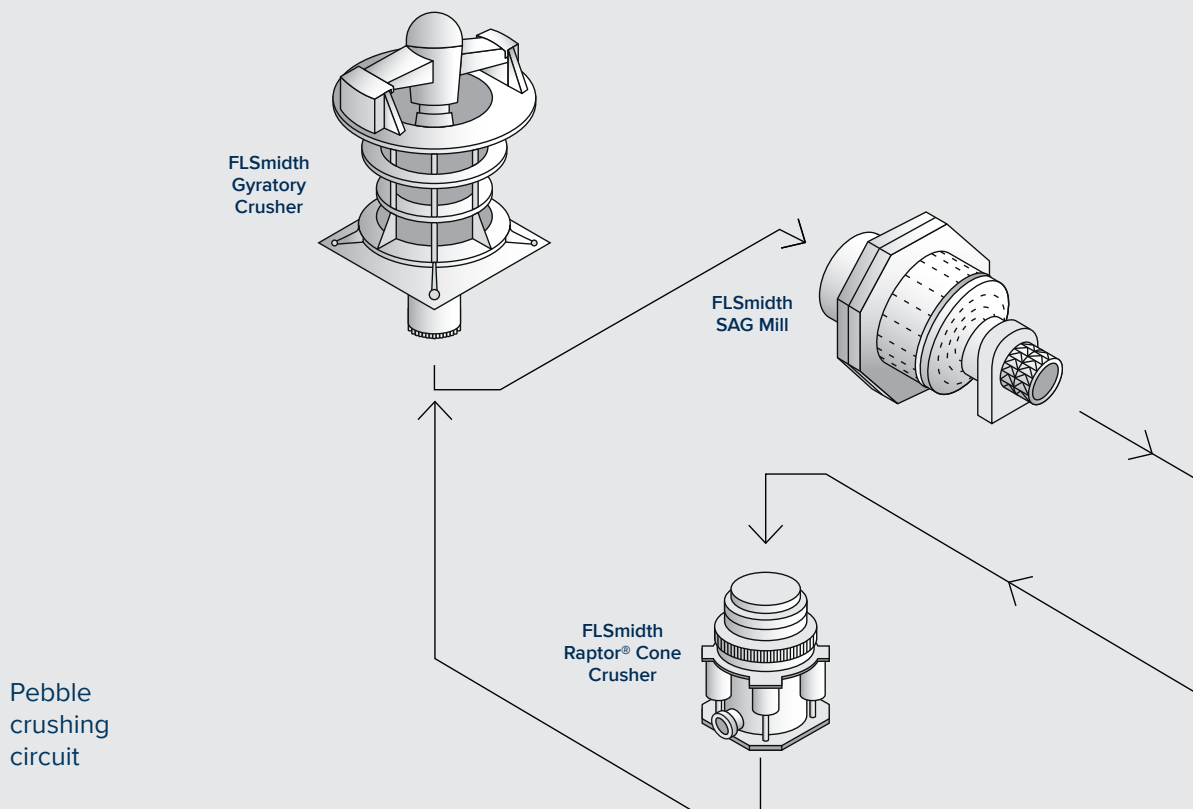
A large open-pit copper mine, producing both oxide and sulphide copper ore, was dealing with issues from excessive heat generation and reduced bearing and liner life in its Raptor® 1100 Cone Crusher. The crusher was operating in the SAG mill circuit, crushing oversized pebbles. Because the mine was working to increase total plant throughput, the cone crusher was required to do more work. The mine was hoping to solve these multiple challenges – reducing the heat generation and bearing wear, while improving production and liner wear life.

### Defining the project

An onsite plant review revealed that both the feed size distribution and the chamber profile were causing crushing to occur higher in the chamber than recommended. The result was an adverse high load distribution on the bearings, which led to the unfavourable heat generation.

**WE DISCOVER POTENTIAL**





## Customer's challenges

- Excessive heat generation
- Reduced component life
- Reduced liner wear life
- Need for increased production

## Solution

It was determined that moving the crushing action farther down into the cone crusher's chamber would reduce the high loading. While the feed gradation could not be modified, the goal could be accomplished with a new liner profile – one that included a coarser feed opening, a more aggressive grip, and a parallel zone located deeper in the chamber. This longer, coarser liner profile would not only facilitate crushing lower in the chamber, but it would also help to address wear life and throughput concerns.

## Results

During the testing of the new liners, they were monitored during the break-in period, where the crusher's closed-side setting (CSS) was reduced from a starting value of 40 mm (1.6-in) to the desired 19 mm (0.75-in). After break-in, at 19 mm CSS, the crusher was producing considerably greater tonnage than with the previous chamber profile — by at least 200 tph (220 stph). The return oil temperature was reduced by 18% (dropping from 60°C/140°F to 49°C/120°F), in spite of the greater tonnage and power draw.

The liner life, measured in tons produced, more than doubled — from 261,000 tonnes (288,000 short tons) to 565,000 tonnes (623,000 short tons). The new liner set operated for 1,054 hours, compared to 709 hours of operation with the previous liner design.

LEARN MORE AT  
[WWW.FLSMIDTH.COM](http://WWW.FLSMIDTH.COM)

### Minerals Technology Centre

FLSmidth, Inc.  
 7158 S FLSmidth Dr.  
 Midvale, UT 84047-5559  
 USA

Tel: +1 801 871 7000  
 Fax: +1 801 871 7001  
 E-mail: [info.MiningLiners@flsmidth.com](mailto:info.MiningLiners@flsmidth.com)

**WE DISCOVER POTENTIAL**