

CASE STUDY

Bullnose® Discharge Cone

The Challenge: Address high Wear Zones in Grinding Mill Discharge Cones

In SAG and AG milling there are three main high wear zones in a standard discharge cone:

1. The nose and main vane
2. The pulp vane (bi-directional wear)
3. The centre deflection ring or nose cone



^Nose and main vane



^Vertical vane



^Centre deflection ring

The Solution: Develop a Design to Mitigate High Wear Zones

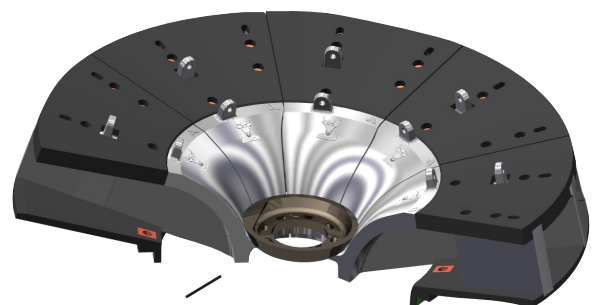
Bradken undertook substantial design analysis of the requirements of the pulp cavities (the dimensional cross sectional areas) of inservice discharge cones. This included both the nose discharge area and wear material thickness of both the vane and nose. This analysis resulted in the design of the Bullnose® discharge cone.

Attributes of the Bradken Bullnose® discharge cone design include:

- Adaptability - can be custom designed for your mill
- Composite wear materials:
 - Cast White Iron nose cone and vanes for maximum wear life
 - Rubber top and bottom plates in low wear zones for overall weight reduction
- Bolting and casting clamping ring
- Maximum throat discharge cross sectional area
- 'Key' system for quick and easy installation during relines requiring no surrounding mating parts to be removed

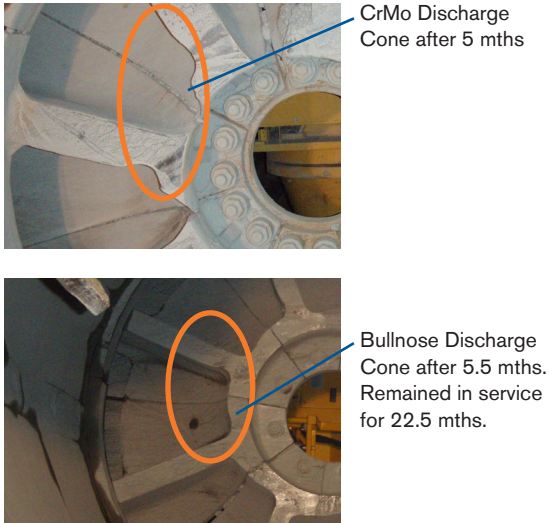
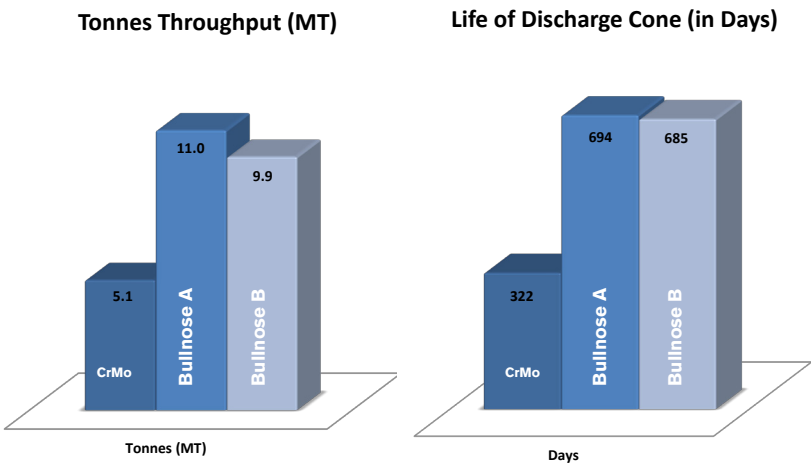


A newly installed Bullnose® Discharge cone



Bullnose® model

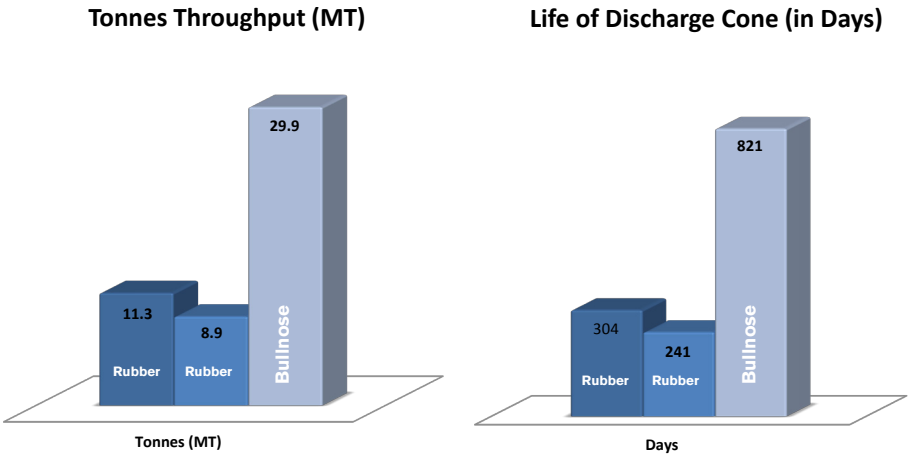
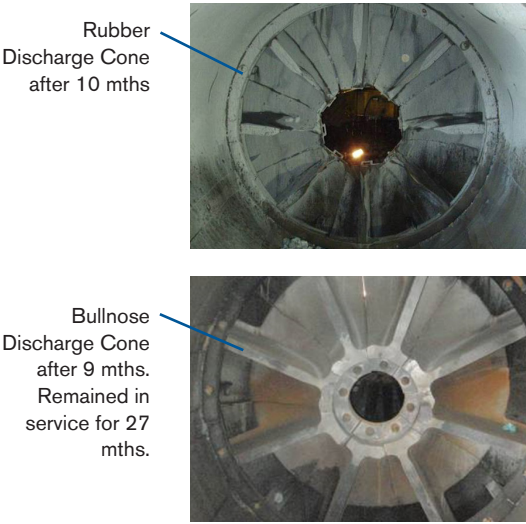
Case Study 1 - Conversion of a CrMo Steel Discharge Cone to a Bullnose® 32ft x 16ft SAG (hard rock)



Outcomes:

- Life extension of 113% over the previous discharge cone
- Mill liner mass reduction of 41%
- Elimination of one reline cycle per year due to longer life of Bullnose
- Increase of 95% on tonnes milled over the previous discharge cone, nearly double the tonnage throughput using Bullnose®

Case Study 2 - Conversion of a Rubber Discharge Cone to a Bullnose® 38ft x 23ft SAG (hard rock)



Outcomes:

- Life extension of 170% over rubber discharge cones
- Elimination of 2 reline cycles per year due to longer life of Bullnose
- Increase of 165% on tonnes milled over the previous discharge cone