

Project:
Darlot Gold Mine

Location:
Western Australia

Project completed:
Ongoing

Market sector:
Underground Construction

Products used & amounts:
MasterRoc MF505C ongoing usage

Sales contact:
Ryan Salter
Business Development Hard
Rock Mining
0418222717
ryan.salter@basf.com
www.master-builders-solutions.basf.com.au/

Darlot Gold Mine

Optimising cemented paste fill using BASF MasterRoc MF 505C



Darlot Gold Mine

The background

Darlot Gold Mine, operated by Gold Fields Australia, is situated 120 kilometers north of Leonora and 58 kilometers east of Leinster in the Yandal Greenstone Belt (Western Australia).

Darlot underground complex utilises paste fill to provide static support for all voids in Lode 1. The required paste strength and cement content varies depending on the planned exposure. Curing time is also dependent on the mix used. Historical curing times for undercut and side exposures are approximately 20 days. Current practice has paste development for mixes with cement content $\geq 2.5\%$ undertaken at four days after finishing paste fill.

The challenge

Darlot required a faster mining cycle to mine the new ore body efficiently. BASF were engaged to assist with the improvement of the paste fill mix utilising chemical admixtures. The aim was to develop a paste where exposure from stoping could commence sooner or cement content could be reduced.

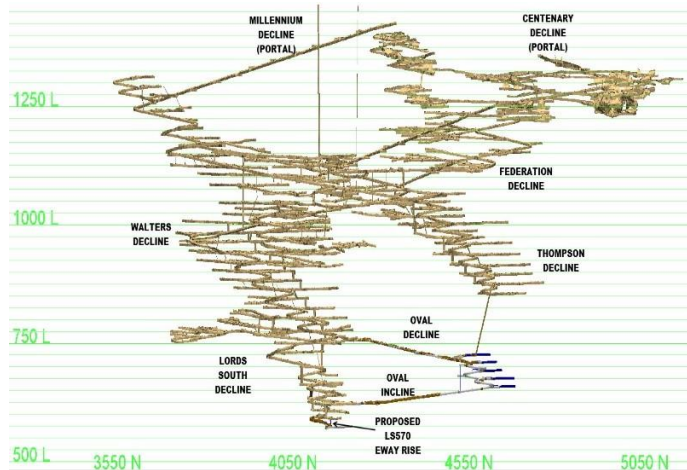
Based on laboratory and site-based trial results, it was decided that MasterRoc MF505C would be added to all stage one (plug) pours in Lode 1 going forward.

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The processing plant at Darlot



Longsection Of the Mine showing the new orebody called the Oval

Our solution

Laboratory and large scale (site-based) trials were undertaken using MasterRoc MF 505C with aim of increasing the quality of paste fill, so that paste development, side exposure and undercut curing times could be reduced and Lode 1 extraction rates could be increased.

The greatest strength gain was observed within the 14 – 28 day undercut curing window, with 400ml per wet tonne chemical addition.

Based on trial results to date, the addition of MasterRoc MF 505C to paste fill mix will allow a two-day reduction in undercut curing time compared to LOM plan.

The customer's benefit

- From test results, the addition of MasterRoc MF 505C to paste mix allows for a 2% reduction in water; the optimal dose rate is 400ml per wet tonne
- Time savings for undercut exposures can be achieved.
- With a 400ml per wet tonne dose rate, dependent on mix used, it should be possible to expose paste one to seven days earlier than the same mix with no chemical addition
- Increased flowability of the mix is demonstrated through slump results with the addition of MasterRoc MF 505C
- A reduction in the number of lumps within the paste occurred with the inclusion of the MasterRoc MF 505C
- Pressures throughout the paste fill line reduced with the inclusion of the MasterRoc MF 505C

Projects facts at a glance

- 1 –7 Days early entry when mining against the paste with MasterRoc MF 505C
- Ability to transport paste longer distances with the addition of the MasterRoc MF 505C
- Cement reduction of 1% can be obtained if pate exposure is not time constrained
- Streangth increase of 16% with the inclusion of the MasterRoc MF 505C

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