TEST NOTE
Confidential

To: Johan Nienaber	**From:** Thilo van der Merwe
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Material: Rock Filla Mining Tamping Foam, S100	
Source:	
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TITLE:

Compatibility testing of stemming foam with emulsions

1. Abstract

Compatibility between Rock Filla mining tamping foam and the surface emulsion S 100 was investigated.

Keywords: Compatibility, S100, Tamping foam

1. BACKGROUND
Polyurethane spray foam Rock Filla was received with the request to test for compatibility with energetic emulsions. It is envisaged that this foam could be used for stemming purposes and thus would require it to be inactive with regards to the emulsion explosive.

2. OBJECTIVE
Investigate if any interaction occurs between the spray foam and the emulsion.

3. EXPERIMENTAL SET-UP AND RESULTS
3.1 Equipment
The equipment used for this study consists of test tubes, heater block and a data logger.

3.2 Description of Test
The spray foam was injected into 4 test tubes which were then filled with S100 emulsion. Though the emulsion was mixed with the foam, the fast curing time for the foam did not allow intricate mixing. The test tubes were place in a heater block that was set at 60^0C and then thermocouples were inserted into the emulsion. The temperature on these thermocouples was monitored for 3 days.

The mixing of emulsion and foam and the testing temperature of 60^{0}C were selected to simulate very harsh conditions. This was done to ensure the best possible scenario for reaction between foam and emulsion, if any would occur.

Fig 1. Foam in test tube

Fig 2. Foam mixed with emulsion in test tubes

Fig 3. Test tubes containing foam and emulsion with thermocouples placed in the heater block

3.3 Results

During the entire 3 days the temperature profile on the data logger stayed constant between 55 – 60 ^{0}C for the thermocouples, thus following the hysteresis cycle of the heating block. The emulsion retained its physical appearance during the entire duration of the experiment.

4. CONCLUSIONS

No increase in temperature profile was experienced during the test, indicating that there was no reaction between the foam and emulsion. The lack of any change in the physical appearance of the emulsion is a further indication that emulsion is stable in the presence of the foam under these reaction conditions.

It seems that the reaction between the diisocyante and the urethane pre-polymer blend present in Rock Filla is much faster than any possible reaction between these chemicals and the ingredients contained in the emulsion. Once the foam is formed, it is inactive with regards to the emulsion.

Rock Filla foam is deemed compatible with AEL's emulsions and the product can therefore be used as stemming material.