



**SNC • LAVALIN**

2 May 2011

**Objet: Mozal TC application**

Dear Reg,

Following your request for a quick summary of the tests performed, please find below background, test methodology and results on Metaltec TC energy retention on demo pipe, with thermometer probes inside the pipe.

**Background :**

Mozal Mozambique is a huge aluminium smelter on the Indian ocean and the river Mozambique shore. High humidity, high UV, storms and cyclones are normal working conditions and equipment needs to sustain those conditions on a constant basis.

After 4 years the whole FTC piping network, chimneys, and pots suffered from major CUI issues.

SNC Lavalin was asked to build up test to check if this new liquid thermal insulation coating provided the same thermal insulation properties as cladding. Therefore we built the following tests methodology to calculate the heat losses on the length of that pipe (25 meters) with both cladding and Metaltec TC as a comparison. We took into account the temperatures of the fluids inside the pipe (130-145°C) and the celerity of the fluid (5 m/s).

**Test methodology :**

- We took a FTC pipe and installed 2 temperature probes inside. Keeping the cladding (15cm) on it first.
- Hundreds of temperature measurements were made in 3-4 weeks on the pipe. Delta t° with existing 4 years old cladding between entry and exit were measured at 1,6 °C delta.
- Then we took off old cladding and coated same pipe with Metaltec TC, at 2,7 mm thickness.
- Same measurements with both probes were done again. Temperature delta between both probes were 0,5°C !

Results :

- The delta  $t^{\circ}$  we measured with cladding was 1,6  $^{\circ}\text{C}$  losses on average over 25 meters of pipe.
- The delta  $t^{\circ}$  with TC was much more impressive with only 0,5 $^{\circ}\text{C}$  losses !
- This means TC was much better (60+% better) to keep energy inside the pipe with no more humidity able to penetrate the coating and corrode the steel.

Also, the cost of renewing the cladding on 10.0000 m<sup>2</sup> was 1.600.000 USD. Cost of TC application (product + labour) was below 1.000.000 USD as per quote given by Metaltec.

The decision will be taken by BHP technical director Mr Peter Hunt. We really believe in this technology for the future.

Please find below related pictures to the tests:



Should you have any questions, do not hesitate to contact me.

Best regards,

**Michael Snyman**  
*Mechanical Engineer*  
SNC-Lavalin South Africa (Pty) Ltd  
Block C, Cullinan Place  
2 Cullinan Close, Morningside,  
Sandton, 2146, Gauteng  
( +27 (0) 11 535 4901  
6 +27 (0) 86 527 3128  
È+27 (0) 82 397 0330  
[michael.snymann@snclavalin.com](mailto:michael.snymann@snclavalin.com)