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**Technical Report 07- 015**

**Subject: CHALMERS BOND STRENGTH TESTING OF STEEL ROLL NECK  
BUSH IN ACCORDANCE WITH ISO 4386-2:1982**

**Author: Bob Batey  
Quality Manager  
K C Engineering Ltd**

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## DISCUSSION:

The bond strength of a roll neck bush has been tested in accordance with ISO 4386-2:1982 – the Chalmers Test:

- Three specimens were tested
- Specimens were manufactured using BS3332-A whitemetal bonded to EN 10025 S275JR grade steel (1050mm dia. x 720mm long)
- Whitemetal layer thickness tested - 8mm (therefore above characteristic limiting value (6mm, reference ISO4381:2000)
- the cross-sectional area of the surface under test was 200mm<sup>2</sup> – (inner diameter of bush >200mm)
- the test was conducted:
  - with apparatus in accordance with the compressive test – (ISO 4386-2 Fig. 2)
  - with a rate of increase of stress at ~5-10Nmm<sup>-2</sup>s<sup>-1</sup>
  - with temperature at 20°C
- Date of test – 2<sup>nd</sup> March, 2007

The bush was manufactured using a dip tinning process and horizontal centrifugal casting in accordance with K.C. Engineering Ltd. process specifications.

## RESULTS:

1. The maximum applied force i.e. at the point of fracture for the three specimens was measured:

Test Piece	Maximum Applied Force
1	15981N
2	15981N
3	16580N

2. The absolute bond strength for each test piece calculated:

Test Piece	Absolute Bond Strength
1	79.9Nmm <sup>-2</sup>
2	79.9Nmm <sup>-2</sup>
3	82.9Nmm <sup>-2</sup>
Average	80.9Nmm <sup>-2</sup>

3. The fracture in each test piece had occurred in the bond surface/whitemetal with no evidence of defects such as lack of bond or porosity.



Figure 1: Test piece showing fractured area

**CONCLUSION:**

The determined bond strength measurements compare favourably with the expected values, as indicated in ISO 4381:2000 – “Plain Bearings – Lead and Tin Casting Alloys for Multilayer Plain Bearings – SnSb8Cu4 –  $\sim 80\text{Nmm}^{-2}$ ”.