



I 069

## L Z TECNOLOGIA

segunda-feira, 16 de fevereiro de 2009

### Certificado de Calibração

Ref.- 09/02/G

De : L Z Tecnologia

Para: Impacta

Certificamos para os devidos fins que o padrão de condutividade número ZAPPI 2009-Cu-IM de nossa fabricação, foi calibrado e rastreados na presente data no laboratório da LZ tecnologia, utilizando padrões "Boeing Standards" números B4-87-205-4, de 03/Aug/87. Este padrão não tem suas condutividades alteradas ao longo do tempo e são por sua vez rastreados aos padrões do "National Bureau of Standards" americano.

| Identificação do Padrão | Material | Condutividade |
|-------------------------|----------|---------------|
| ZAPPI 2009 - Cu-IM      | Cobre    | 101,0 %IACS   |

**Impacta Instrumentos**  
**Padrão: I 069**  
**Validade: Indeterminado**

Temperatura média durante a medição 20,6°C

| Padrões<br>Base<br>"Boeing"<br>%IACS | Média<br>total das<br>medições<br>%IACS | 10 últimas medidas obtidas em %IACS |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
|--------------------------------------|---|-------------------------------------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
|                                      |   | Intervalo de tempo entre as medidas |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
|                                      |   | 1°                                  | 15' | 2°    | 15' | 3°    | 15' | 4°    | 15' | 5°    | 15' | 6°    | 15' | 7°    | 15' | 8°    | 15' | 9°    | 24h | 10°   |
| 101,59                               | 101,0                                   | 101,0                               |     | 100,9 |     | 101,0 |     | 101,0 |     | 101,0 |     | 101,0 |     | 101,0 |     | 101,0 |     | 101,0 |     | 101,0 |

Atenciosamente:

  
Leonardo Zappi

### L Z Tecnologia

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**BTS  
CALIBRATION REPORT  
FOR  
CONDUCTIVITY STANDARD**

THE BOEING COMPANY  
P.O. BOX 3999  
Bldg. 15.05 M/S 2P-30  
SEATTLE, WA 98124-2499  
PHONE 1-206-655-8320  
1-206-237-4490

CUSTOMER :  
Tecnatron  
Tecnologia Eletronica Ltd.

ITEM :  
CUSTOMER PO# :  
CONTROL # : 998-709  
MANUFACTURER : BOEING  
MODEL : 75-17C  
SERIAL NUMBER : B4-87-205  
CAL. REQUIRED : Supply and Calibrat

CALIBRATION RESULTS:

The conductivity values given below were obtained in an oil bath by comparison with laboratory standards at 60 kHz. The ZIACS figures shown have an uncertainty of  $\pm 0.35\%$  IACS or  $\pm 1.0\%$  of the value whichever is less at 20 deg. C at time of measurement. The temperature correction factors (TCF) are correct to  $\pm 0.0002$  between 15 deg. C and 25 deg. C. The upper surfaces of the standards must be kept in a condition consistent with good measurement techniques. The surface specifications given in Boeing Process Specification BAC 5946 are recommended as a guide.

| <u>Standard Number</u> | <u>Type of Metal</u> | <u>ZIACS</u> | <u>TCF/deg. C</u> |
|------------------------|----------------------|--------------|-------------------|
| B4-87-205-1            | Phos. Bronze         | 16.17        | 0.0008            |
| B4-87-205-2            | Aluminum             | 44.17        | 0.0029            |
| B4-87-205-3            | Aluminum             | 60.47        | 0.0040            |
| B4-87-205-4            | Copper               | 101.59       | 0.0040            |

For temperatures other than 20 deg. C :

Relative Conductivity = ZIACS  $[1 + TCF(20-T_x)]$

where: ZIACS is the conductivity value from the table,  
TCF is the temperature correction factor from the table, and  
T<sub>x</sub> is the temperature of the standard in degrees C

STANDARDS USED TO ESTABLISH THE BASIS FOR THIS CALIBRATION  
ARE TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS  
TEST NUMBER 521/221183 (9-24-79), 224876 (3-12-81),  
738/233171-84 (7-26-84), AND 738/233625-85 (3-20-85).  
THE CALIBRATION INTERVAL IS TO BE ESTABLISHED BY THE CUSTOMER  
AND IS NOT IMPLIED BY THIS REPORT

Calibration Date 08-03-87

Technician Phillip Baier  
Engineer Pat Snyder