



# CERTIFICADO DE PRUEBAS EN FABRICA

Tubos de Acero de México, S.A.  
 Km 433.7 Carr. México-Veracruz  
 Via Xalapa  
 (91697) Veracruz, Ver., México  
 (52) 229 989 1100 tel

|  |  |  |  |   |  |   |  |  |  |
|--|--|--|--|---|--|---|--|--|--|
| <b>CLIENTE / PURCHASER</b><br>TUBOS CONEXIONES Y TANQUES S.A. DE C.V.    |  | <b>Confirmación de Venta / Sales Confirmation</b><br>048571/06 |  | <b>Número / Number</b><br>02013794                              |  | <b>Fecha / Date</b><br>09/09/2002                               |  | <b>Pág / Page</b><br>2/4                         |  |
| <b>Tubo / Type of Pipe</b><br>ESF CONDUCCION / COLD DRAWN LP SEAMLESS    |  | <b>Orden Cliente / Purchaser Order</b>                         |  | <b>Compañía de Inspección / Inspection Company</b>              |  | <b>Inspector / Inspector</b>                                    |  |  |  |
| <b>Norma / Standard or Specification</b><br>ASTM A53/A106, 99B/99        |  | <b>Grado de Acero / Steel Grade</b><br>B                       |  | <b>Extremos / Ends</b><br>LISO CORTE RECTO / PLAIN END          |  |   |  |  |  |
| <b>Dimensiones / Dimensions</b><br>1 1/2 X 0.188 INCH<br>21.30 X 4.78 MM |  | <b>Cédula / Schedule</b>                                       |  | <b>Peso Nominal / Nominal Weight</b><br>1.31 LB/FT<br>1.95 KG/M |  | <b>Longitud / Length</b><br>16.40 / 24.60 FT<br>5.00 / 7.50 MTS |  | <b>Superficie / Surface</b><br>ACEITADO / OILED  |  |
|  |  |  |  |   |  |   |  | <b>Cantidades / Quantities</b><br>251 Pzas / Pcs |  |

## ANÁLISIS QUÍMICO / CHEMICAL ANALYSIS

| Colada / Heat | Probeta / Sample | P | Min |    |    |    |    |    |    |    |     |   | Max   |    |    |    |    |    |   |    |    |     |     |    |    |    |    |   |   |    |   |  |  |  |
|---------------|------------------|---|-----|----|----|----|----|----|----|----|-----|---|-------|----|----|----|----|----|---|----|----|-----|-----|----|----|----|----|---|---|----|---|--|--|--|
|               |                  |   | C   | Si | Mn | Ni | Cr | S  | P  | Mo | Cu  | V | Al    | Sn | Nb | Ti | As | Ca | B | N  | CE | PCM | CEC | Pb | Sb | Bi | AI | B | O | Mg | H |  |  |  |
|               |                  |   | 100 |    |    |    |    |    |    |    |     |   | 10000 |    |    |    |    |    |   |    |    |     |     |    |    |    |    |   |   |    |   |  |  |  |
|               |                  |   | X   |    |    |    |    |    |    |    |     |   | X     |    |    |    |    |    |   |    |    |     |     |    |    |    |    |   |   |    |   |  |  |  |
| 58312         | 10070            | P | 15  | 19 | 61 | 6  | 5  | 9  | 11 | 21 | 130 | 0 | 23    | 10 | 0  | 0  | 6  | 18 | 0 | 43 |    |     |     |    |    |    |    |   |   |    |   |  |  |  |
| 58312         | 10071            | P | 15  | 18 | 57 | 4  | 6  | 15 | 6  | 22 | 133 | 0 | 22    | 11 | 0  | 0  | 6  | 19 | 0 | 43 |    |     |     |    |    |    |    |   |   |    |   |  |  |  |

**Notas / Notes**

H= Análisis de colada / Heat Analysis

P= Análisis de producto / Product Analysis

N/A= No Aplica / Does Not Apply

Este documento certifica que los productos descritos aquí fueron manufacturados, probados y/o inspeccionados de acuerdo con la especificación de referencia y satisface las correspondientes requerimientos. Este certificado se emite mediante un sistema computarizado y es válido con firma electrónica. En el certificado original el logotipo Tenaris (verno) está impreso en la hoja. En caso de que el poseedor del certificado entregue una fotocopia del mismo, deberá garantizar la conformidad con el original, y se hace responsable por cualquier uso ilegal o indebido. Cualquier alteración y/o falsificación será sujeta a la ley. This is to certify that the products described here in were manufactured, sampled, tested, and/or inspected in accordance with the specification referenced and meets the requirements in all respects. This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trade-mark green coloured Tenaris' is stamped. In case the owner of the original certificate would release a copy of it, he must attest its conformity to the original one, taking upon himself the responsibility for any unlawful or not allowed use. Any alteration and/or falsification will be subjected to the law.

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| <b>Tubo de Tubo / Type of Pipe</b><br>ESF CONDUCCION / COLD DRAWN LP SEAMLESS |  | <b>Orden Cliente / Purchaser Order</b><br>B                    |  | <b>Compañía de Inspección / Inspection Company</b><br>LISO CORTE RECTO / PLAIN END |  | <b>Extremos / Ends</b><br>ACETADO / OILED                       |  | <b>Inspector / Inspector</b>                     |  |
| <b>Norma / Standard or Specification</b><br>ASTM A53/A106, 99B/99             |  | <b>Cédula / Schedule</b>                                       |  | <b>Peso Nominal / Nominal Weight</b><br>1.31 LB/FT<br>1.95 KG/M                    |  | <b>Longitud / Length</b><br>16.40 / 24.60 FT<br>5.00 / 7.50 MTS |  | <b>Superficie / Surface</b><br>ACETADO / OILED   |  |
| <b>Dimensiones / Dimensions</b><br>1/2 X 0.188 INCH<br>21.30 X 4.78 MM        |  |  |  |  |  |   |  | <b>Cantidades / Quantities</b><br>251 Pzas / Pcs |  |

## ENSAYOS DE DUREZAS / HARDNESS TEST

| Colada / Heat        | 58312   | Lecturas Obtenidas / Obtained Readings |      |      | Colada / Heat    | 58312                | Lecturas Obtenidas / Obtained Readings |       |      | Colada / Heat    | 58312   | Lecturas Obtenidas / Obtained Readings |      |       | Colada / Heat    | 58312   | Lecturas Obtenidas / Obtained Readings |                      |      |       |     |     |     |
|----------------------|---------|--|------|------|------------------|----------------------|--|-------|------|------------------|---------|--|------|-------|------------------|---------|--|----------------------|------|-------|-----|-----|-----|
| Probeta / Sample     | 10070   | 1                                      | 2    | 3    | Probeta / Sample | 10071                | 1                                      | 2     | 3    | Probeta / Sample | 10071   | 1                                      | 2    | 3     | Probeta / Sample | 10071   | 1                                      | 2                    | 3    |       |     |     |     |
| Quadrante / Quadrant | DE / OD | 74.0                                   | 75.0 | 74.0 | 74.3             | DE / OD              | 74.0                                   | 74.0  | 74.0 | 74.0             | DE / OD | 74.0                                   | 74.0 | 74.0  | 74.0             | DE / OD | 74.0                                   | 74.0                 | 74.0 |       |     |     |     |
|                      | C / MW  | 75.0                                   | 74.0 | 74.0 | 74.3             | C / MW               | 74.0                                   | 74.0  | 74.0 | 74.0             | C / MW  | 74.0                                   | 74.0 | 74.0  | 74.0             | C / MW  | 74.0                                   | 74.0                 | 74.0 |       |     |     |     |
|                      | DI / ID | 74.0                                   | 74.0 | 75.0 | 74.3             | DI / ID              | 74.0                                   | 74.0  | 74.0 | 74.0             | DI / ID | 74.0                                   | 74.0 | 74.0  | 74.0             | DI / ID | 74.0                                   | 74.0                 | 74.0 |       |     |     |     |
| REQUERIDO / REQUIRED |         | Min                                    | Max  | P/A  | Var              | REQUERIDO / REQUIRED |  | Min   | Max  | P/A              | Var     | REQUERIDO / REQUIRED                   |      | Min   | Max              | P/A     | Var                                    | REQUERIDO / REQUIRED |      | Min   | Max | P/A | Var |
| HRC                  |         | 22.00                                  |      |      |                  | HRC                  |  | 22.00 |      |                  |         | HRC                                    |      | 22.00 |                  |         |  | HRC                  |      | 22.00 |     |     |     |

| Colada / Heat        | 58312   | Lecturas Obtenidas / Obtained Readings |      |      | Colada / Heat    | 58312                | Lecturas Obtenidas / Obtained Readings |       |      | Colada / Heat    | 58312   | Lecturas Obtenidas / Obtained Readings |      |       | Colada / Heat    | 58312   | Lecturas Obtenidas / Obtained Readings |                      |      |       |     |     |     |
|----------------------|---------|--|------|------|------------------|----------------------|--|-------|------|------------------|---------|--|------|-------|------------------|---------|--|----------------------|------|-------|-----|-----|-----|
| Probeta / Sample     | 10070   | 1                                      | 2    | 3    | Probeta / Sample | 10071                | 1                                      | 2     | 3    | Probeta / Sample | 10071   | 1                                      | 2    | 3     | Probeta / Sample | 10071   | 1                                      | 2                    | 3    |       |     |     |     |
| Quadrante / Quadrant | DE / OD | 74.0                                   | 75.0 | 74.0 | 74.3             | DE / OD              | 74.0                                   | 74.0  | 74.0 | 74.0             | DE / OD | 74.0                                   | 74.0 | 74.0  | 74.0             | DE / OD | 74.0                                   | 74.0                 | 74.0 |       |     |     |     |
|                      | C / MW  | 75.0                                   | 74.0 | 74.0 | 74.3             | C / MW               | 74.0                                   | 74.0  | 74.0 | 74.0             | C / MW  | 74.0                                   | 74.0 | 74.0  | 74.0             | C / MW  | 74.0                                   | 74.0                 | 74.0 |       |     |     |     |
|                      | DI / ID | 74.0                                   | 74.0 | 75.0 | 74.3             | DI / ID              | 74.0                                   | 74.0  | 74.0 | 74.0             | DI / ID | 74.0                                   | 74.0 | 74.0  | 74.0             | DI / ID | 74.0                                   | 74.0                 | 74.0 |       |     |     |     |
| REQUERIDO / REQUIRED |         | Min                                    | Max  | P/A  | Var              | REQUERIDO / REQUIRED |  | Min   | Max  | P/A              | Var     | REQUERIDO / REQUIRED                   |      | Min   | Max              | P/A     | Var                                    | REQUERIDO / REQUIRED |      | Min   | Max | P/A | Var |
| HRC                  |         | 22.00                                  |      |      |                  | HRC                  |  | 22.00 |      |                  |         | HRC                                    |      | 22.00 |                  |         |  | HRC                  |      | 22.00 |     |     |     |

**NOTES:** P/A = Promedio / Average      DE/OD = Diámetro Exterio / Outside Diameter      C/MW = Centro / Mid Wall      Min = Mínimo / Minimum      DI/ID = Diámetro Interior / Internal Diameter      Max= Máximo / Maximum      N/A= No Aplica / Does Not Apply

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| <b>Tipo de Tubo / Type of Pipe</b><br>ESF CONDUCCION / COLD DRAWN LP SEAMLESS |  | <b>Orden Cliente / Purchaser Order</b><br>B                    |  | <b>Compañía de Inspección / Inspection Company</b>              |  | <b>Inspector / Inspector</b>                                    |  |   |  |  |
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| <b>Dimensiones / Dimensions</b><br>1/2 X 0.188 INCH<br>21.30 X 4.78 MM        |  | <b>Cédula / Schedule</b>                                       |  | <b>Peso Nominal / Nominal Weight</b><br>1.31 LB/FT<br>1.95 KG/M |  | <b>Longitud / Length</b><br>16.40 / 24.60 FT<br>5.00 / 7.50 MTS |  | <b>Superficie / Surface</b><br>ACEITADO / OILED |  | <b>Cantidades / Quantities</b><br>251 Pzas / Pcs |

**Fabricado por / Manufactured by** TAMSAM

**Fabricación de acero / Steel making process** Horno de Arco Eléctrico-Horno de Afinación-Máquina de Colada Continua. Acero calmado con aluminio. / Electric Arc Furnace-Ladle Furnace-Continuous Casting Machine. Fully Killed Steel.

**Fabricación de tubo / Pipe manufacturing process** Estirado en frío sin costura / Seamless Cold Drawn

**Material libre de contaminación de Mercurio / Material free from Mercury contamination**

**No reparado por soldadura / No repair by welding**

**Tratamiento térmico / Heat treatment**

**Control no destructivo / Non destructive test**

**Método de inspección / Inspection method**

**Mandril / Drift Diámetro / Diameter** N/A

**Prueba hidráulica / Hydrostatic test pressure** N/A

**Notas / Notes**

ASTM A53, A106 GR-B

MATERIAL DE ACUERDO A NACE MR0175-97

CANCELA Y SUSTITUYE AL CERTIFICADO DEL 08/09/2002 DEL MISMO NUMERO

ING. SARA GARCIA PAJARES  
 CERTIFICACION DE CALIDAD NOMBRE Y FIRMA /  
 QUALITY CERTIFICATION NAME AND SIGNATURE

TAMSA REF: 353196  
 \*\*\*Fin del Informe / End of Report\*\*\*

Este documento certifica que los productos descritos aquí fueron manufacturados, probados y/o inspeccionados de acuerdo con la especificación de referencia y satisfacen los correspondientes requerimientos. Esta certificación se emite mediante un sistema computarizado y es idéntico con firma electrónica. En el certificado original el logotipo Tenaris (verde) está impreso en la hoja. En caso de que el poseedor del certificado entregue una fotocopia del mismo, deberá garantizar la conformidad con el original, y ser responsable en todos los aspectos. Este certificado es emitido por un sistema automatizado y no requiere firma. On the original certificate the trade-mark green coloured 'Tenaris' is stamped. In case the owner of the original certificate would release a copy of it, he must attest its conformity to the original one, taking upon himself the responsibility for any unlawful or not allowed use. Any alteration and/or falsification will be subjected to the law.