

**CERTIFICADO DE CALIDAD
INSPECTION CERTIFICATE**
(DIN EN 10204:2004E - ISO 10474 3.1.B)

Número:
Number:

22528

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1.DE 1

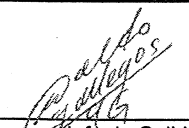
Tubos de Acero de México, S.A.
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|------------------------|--|---|-------------|------------------------------------|-------|-------------|--------------------|
| Vendido a: Sold to: | PROVEEDORA DE MATERIALES AN CER, S.Á. DE C.V. | Pedido del Cliente No: Customers Order No: | 5382 - 5386 | Lista de Empaque: Packing List: | 11466 | Fecha/Date: | 8 de Junio de 2009 |
|------------------------|--|---|-------------|------------------------------------|-------|-------------|--------------------|

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| Especificaciones y Grados / Standard or Specification and Steel Grade Seamless Fittings according to ASTM A 234M WPB-07, NACE MR 01.75-2003 Conform to ASME II Ed. 2001 ASME SA-234M Grade WPB, NACE MR0103-2003 | Dimensiones y tolerancias / Dimension and tolerances ASME B 16.9 - 2007 and ASME B 16.28 - 1994 | Factura/Invoice: Bocas / Ends Biselado / Bevelled ends |
|--|---|---|

| DESCRIPCION DE MATERIAL / MATERIAL DESCRIPTION | | | | PRUEBAS MECANICAS / MECHANICAL TEST | | | | PRUEBA DE IMPACTO 0°C / IMPACT TEST 0°C | | | | |
|--|------------------|-------------------|---------------------------|-------------------------------------|-------------------------------------|------------|---------------------|---|----------|----------|----------|-------------------------|
| ART. ITEM | COLADA HEAT CODE | CANTIDAD QUANTITY | DESCRIPCION / DESCRIPTION | ESF. CEDENCIA YIELD STRENGTH (Mpa) | ESF. RUPTURA TENSILE STRENGTH (Mpa) | ELONG. %2" | DUREZA HARDNESS HBW | DIMENSIONES SAMPLE DIM mm | 1 Joules | 2 Joules | 3 Joules | PROMEDIO AVERAGE Joules |
| 1 | S31103 | 120 | CODO 3 X 90° R.L. CED-STD | 304 | 510 | 29 | 116 | | | | | |
| 2 | T41645 | 11 | CODO 12 X 45° CED-XS | 323 | 477 | 35 | 100 | | | | | |
| 3 | S31681 | 106 | CODO 3 X 90° R.L. CED-XS | 273 | 443 | 33 | 109 | | | | | |
| 4 | S20249 | 13 | CODO 4 X 45° CED-STD | 279 | 478 | 35 | 111 | | | | | |
| 5 | S27721 | 7 | CODO 4 X 45° CED-STD | 364 | 509 | 27 | 119 | | | | | |
| 6 | S26549 | 20 | CODO 4 X 45° CED-STD | 290 | 474 | 32 | 93 | | | | | |
| 7 | T41827 | 2 | CODO 10 X 45° CED-STD | 358 | 502 | 33 | 103 | | | | | |
| 8 | T42161 | 10 | CODO 10 X 45° CED-STD | 332 | 495 | 33 | 94 | | | | | |
| 9 | S33415 | 17 | CODO 4 X 90° R.C. CED-STD | 324 | 497 | 27 | 126 | | | | | |
| 10 | S21041 | 19 | CODO 4 X 90° R.C. CED-STD | 282 | 477 | 34 | 119 | | | | | |
| 11 | S21712 | 16 | CODO 4 X 90° R.C. CED-STD | 324 | 470 | 39 | 112 | | | | | |

| ANALISIS QUIMICO / CHEMICAL ANALYSIS | | | | | | | | | | | | | | Certificamos que los resultados de los Análisis Químicos y Pruebas Mecánicas son verdaderos o una copia fiel de los certificados enviados por el Fabricante y/o el proveedor | | |
|--------------------------------------|------------------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
| PROCESO PROCESS | COLADA HEAT CODE | COLADA/HEAT M.P./MOTHER PIPE | %C.E. | %C | %Mn | %P | %S | %Si | %Cr- | %Cu | %Mo | %Ni | %V | %Nb | | |
| HF | S31103 | 31103 | 0.330 | 0.180 | 0.760 | 0.010 | 0.001 | 0.290 | 0.050 | 0.066 | 0.010 | 0.026 | 0.001 | 0.000 | de Materia Prima (Tubería Sin Costura) conforme ASTM A106 Grado B con N°: | |
| HF | T41645 | 41645 | 0.310 | 0.180 | 0.660 | 0.014 | 0.001 | 0.280 | 0.050 | 0.050 | 0.010 | 0.030 | 0.000 | 0.000 | We certify that result of chemical analysis and mechanical test are true and correct | |
| HF | S31681 | 31681 | 0.320 | 0.190 | 0.730 | 0.007 | 0.001 | 0.260 | 0.020 | 0.020 | 0.010 | 0.022 | 0.001 | 0.001 | copy of the test certificate issued by the manufacturer and/or supplier Raw | |
| HF | S20249 | 20249 | 0.320 | 0.180 | 0.740 | 0.013 | 0.001 | 0.310 | 0.040 | 0.031 | 0.010 | 0.024 | 0.001 | 0.000 | material (Seamless Pipe) certs conform to ASTM A106 Grade B N°: | |
| HF | S27721 | 27721 | 0.320 | 0.180 | 0.770 | 0.011 | 0.001 | 0.290 | 0.040 | 0.050 | 0.010 | 0.027 | 0.001 | 0.002 | 456783 8059875 461066 358039 433886 420901 8065052 | |
| HF | S26549 | 26549 | 0.320 | 0.180 | 0.750 | 0.014 | 0.001 | 0.300 | 0.050 | 0.032 | 0.010 | 0.015 | 0.001 | 0.001 | 8065052 218551 370444 373284 | |
| HF | T41827 | 41827 | 0.300 | 0.160 | 0.670 | 0.011 | 0.001 | 0.270 | 0.060 | 0.063 | 0.031 | 0.040 | 0.006 | 0.000 | Este material cumple con los requerimientos especificados en la orden. | |
| HF | T42161 | 42161 | 0.310 | 0.180 | 0.680 | 0.015 | 0.001 | 0.280 | 0.040 | 0.051 | 0.009 | 0.020 | 0.000 | 0.000 | The material of this certificate heat number mentioned above is in compliance | |
| HF | S33415 | 33415 | 0.339 | 0.180 | 0.830 | 0.014 | 0.001 | 0.300 | 0.050 | 0.065 | 0.020 | 0.033 | 0.001 | 0.001 | with the requirements specified in the order". | |
| HF | S21041 | 21041 | 0.330 | 0.190 | 0.740 | 0.013 | 0.001 | 0.300 | 0.040 | 0.032 | 0.010 | 0.033 | 0.001 | 0.002 | | |
| HF | S21712 | 21712 | 0.320 | 0.190 | 0.720 | 0.012 | 0.001 | 0.250 | 0.040 | 0.041 | 0.010 | 0.023 | 0.001 | 0.001 | | |

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| Notas: Formado en caliente a 620°C-980°C, enfriado al aire; Formado en frío normalizado a 940°C max. Tiempo de permanencia 10'. Inspección Dimensional: Satisfactoria. HF: FORMADO EN CALIENTE/HOT FORMED | Notes: Hot formed fittings in a range from 620°C to 980°C, cooled in still air. Cold formed normalized at 940°C max. Holding time 10'. Visual dimensional check: Satisfactory CF: FORMADO EN FRIO/COLD FORMED |  Quality Manager/Jefe de Calidad: ING. WALDO GALLEGOS GALVAN | The Products described herein were produced in accordance with the above referenced specification and are identified with the "R" which is permanently marked on each fitting./ The values of hardness for fittings NPS 2 1/2" and smaller ones obtain from the conversion of hardness Rockwell B to hardness Brinell HBW by means of table WILSON DESK CHART 60. Los valores de dureza para conexiones de NPS de 2 1/2" y menores, se obtienen de la conversión de dureza Rockwell B a dureza Brinell HBW mediante la tabla WILSON DESK CHART 60. |
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