



**CERTIFICADO DE CALIDAD  
INSPECTION CERTIFICATE**  
(DIN EN 10204:2004E - ISO 10474.3.1.B)

Tubos de Acero de México, S.A.  
Carr. Mty-Laredo Km. 24.2  
Apartado Postal 43  
(65550) C. de Flores, N.L. Méx.  
(52) 81 8305 9600 tel  
(52) 81 8305 9620 fax

Vendido a: **PROVEEDORA DE MATERIALES ANGER, S. A.**  
DE C. V.

Pedido del Cliente No: **5277 - 5249 - 5284 -**  
Customers Order No:

Lista de Empaque: **1 0 8 7 4**  
Packing List:

Fecha/Date: **30 de Septiembre de 2008**

Especificaciones y Grados / Standard or Specification and Steel Grade  
Seamless fittings according to ASTM A 234 "W" WPB-97, A234 "W" WPB-05a, NACE MR 01.75-2003  
Conform to ASME II Ed. 2001 ASME SA-234 "W" Grade WPB, NACE MR0103-2003

Dimensiones y tolerancias / Dimension and tolerances  
ASME B 16.9 - 2003 and ASME B 16.28 - 1994

Factura/Invoice: **Bocas / Ends**  
Biselado / Bevelled ends

**DESCRIPCION DE MATERIAL / MATERIAL DESCRIPTION**

ART. ITEM	COLADA HEAT CODE	CANTIDAD QUANTITY	DESCRIPCION / DESCRIPTION
1	S47792	6	CODO 5 X 90° R. C. CED-STD
2	S23663	4	CODO 5 X 90° R. C. CED-STD
3	T41272	48	TEE RED. 8 X 4 CED-STD
4	T27384	6	TEE 10 CED-80
5	S48307	100	CODO 3 X 45° CED-XS
6	T40156	5	RED. CONC. 10 X 5 CED-STD

**PRUEBAS MECANICAS / MECHANICAL TEST**

ESF. CEDENCIA YIELD STRENGTH (Mpa)	ESF. RUPURA TENSILE STRENGTH (Mpa)	ELONG. %2"	DUREZA HARDNESS HBW
308	487	31	115
246	448	33	108
289	498	32	105
316	504	50	100
294	467	38	119
304	465	42	104

**PRUEBA DE IMPACTO 0°C / IMPACT TEST 0°C**

DIMENSIONES SAMPLE DIM mm	1 Joules	2 Joules	3 Joules	PROMEDIO AVERAGE Joules

**ANALISIS QUIMICO / CHEMICAL ANALYSIS**

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	S47792	47792	0.320	0.180	0.730	0.014	0.001	0.280	0.050	0.029	0.040	0.018	0.001	0.001
HF	S23663	23663	0.310	0.170	0.720	0.012	0.002	0.290	0.040	0.071	0.010	0.035	0.001	0.001
HF	T41272	41272	0.340	0.190	0.820	0.017	0.002	0.310	0.050	0.040	0.010	0.030	0.000	0.000
HF	T27384	27384	0.290	0.160	0.660	0.008	0.002	0.270	0.050	0.067	0.028	0.030	0.000	0.000
HF	S48307	48307	0.330	0.190	0.730	0.010	0.001	0.270	0.040	0.027	0.030	0.037	0.001	0.001
CF	T40156	40156	0.310	0.170	0.730	0.010	0.002	0.280	0.040	0.050	0.006	0.030	0.000	0.000

Confirmamos que los resultados de los Analisis Quimicos y Pruebas Mecanicas son verdaderos o una copia fiel de los certificados enviados por el Fabricante y/o el proveedor de Materia Prima (Tuberia Sin Costura) conforme ASTM A106 Grado B con N°.

We certify that result of chemical analysis and mechanical test are true and correct copy of the test certificate issued by the manufacturer and/or supplier Raw material (Seamless Pipe) certs conform to ASTM A106 Grade B N°: 338647 7049571 8050726 6005433 347507 8041349

Este material cumple con los requerimientos especificados en la orden.  
The material of this certificate heat number mentioned above is in compliance with the requirements specified in the order.

Notes:  
Formado en caliente a 620°C-980°C, enfriado al aire.  
Formado en frio normalizado a 940°C max.  
Tiempo de permanencia 10'.  
Holding time 10'.  
Inspeccion Dimensional: Satisfactoria.  
Visual dimensional check: Satisfactory

Hot formed fittings in a range from 620°C to 980°C, cooled in still air.  
Cold formed normalized at 940°C max.  
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.

HF: FORMADO EN CALIENTE/HOT FORMED

CF: FORMADO EN FRIO/COLD FORMED

CC-008