



**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
(55550) 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: 5274 - 5271 - 5238 - 5256 - 5273 - 5270
Customers Order No: 20972

Dimensiones y tolerancias / Dimension and tolerances

ASME B 16.9 - 2003 and ASME B 16.28 - 1994

Lista de Empaque: 1 079 4 Fecha/Date: 4 de Septiembre de 2008
Packing List:

Factura/Invoice: Bocas / Ends
Biselado / Bevelled ends

Especificaciones y Grados / Standard or Specification and Steel Grade
Seamless fittings according to ASTM A 234 WPB-87, A234 WPB-86, NACE MR 01-75-2003
Conform to ASME II Ed. 2001 ASME SA-234 WPB, NACE MR0103-2003

ART. ITEM	COLADA HEAT CODE	CANTIDAD QUANTITY	DESCRIPCION / DESCRIPTION	PRUEBAS MECANICAS / MECHANICAL TEST							PRUEBA DE IMPACTO 0°C / IMPACT TEST 0°C			
				ESF. CEDENCIA YIELD STRENGTH (Mpa)	ESF. RUPURA TENSILE STRENGTH (Mpa)	ELONG. % ^{2"}	DUREZA HARDNESS HBW	DIMENSIONES SAMPLE DIM mm	1 Joules	2 Joules	3 Joules	PROMEDIO AVERAGE Joules		
1	S26550	211	CODO 4 X 90° R.L. CED-STD	341	475	34	95							
2	S26549	158	CODO 4 X 90° R.L. CED-STD	290	474	32	93							
3	S27721	87	CODO 4 X 90° R.L. CED-STD	364	509	27	119							
4	S29077	528	CODO 3 X 90° R.L. CED-STD	323	500	30	127							
5	S29078	528	CODO 3 X 90° R.L. CED-STD	313	482	31	111							
6	S32031	95	RED. CONC. 2 X 1 1/2 CED-STD	385	521	50	112							
7	S23751	5	RED. CONC. 2 X 1 1/2 CED-STD	345	511	28	120							
8	S22585	50	RED. CONC. 2 1/2 X 2 CED-STD	339	499	32	109							
9	S45280	43	CODO 1 1/4 X 45° CED-STD	357	511	28	122							
10	T39854	24	TEE RED. 8 X 4 CED-STD	290	470	43	102							
11	T28071	8	RED. CONC. 6 X 2 1/2 CED-STD	353	487	37	108							

ANALISIS QUIMICO / CHEMICAL ANALYSIS

PROCESO PROCESS	COLADA HEAT CODE	COLADA M.P./MOTHER PIPE	%C.E.	%C	%Mn	%P	%S	%SI	%Cr	%Cu	%Mo	%Ni	%V	%Nb
HF	S26550	26550	0.320	0.190	0.010	0.002	0.270	0.040	0.018	0.010	0.013	0.001	0.001	0.001
HF	S26549	26549	0.320	0.180	0.014	0.001	0.300	0.050	0.032	0.010	0.015	0.001	0.001	0.001
HF	S27721	27721	0.320	0.180	0.011	0.001	0.290	0.040	0.050	0.010	0.027	0.001	0.002	0.001
HF	S29077	29077	0.320	0.180	0.011	0.002	0.280	0.040	0.028	0.020	0.018	0.001	0.000	0.000
HF	S29078	29078	0.320	0.190	0.010	0.002	0.260	0.040	0.035	0.010	0.017	0.001	0.000	0.000
CF	S32031	32031	0.350	0.200	0.010	0.001	0.300	0.030	0.024	0.020	0.018	0.001	0.001	0.001
CF	S23751	23751	0.340	0.180	0.009	0.001	0.300	0.060	0.040	0.030	0.025	0.001	0.002	0.001
CF	S22585	22585	0.310	0.170	0.011	0.001	0.270	0.040	0.027	0.010	0.022	0.001	0.002	0.001
HF	S45280	45280	0.323	0.180	0.010	0.001	0.300	0.050	0.055	0.020	0.048	0.001	0.000	0.000
HF	T39854	39854	0.310	0.180	0.013	0.002	0.290	0.040	0.056	0.008	0.030	0.000	0.000	0.000
CF	T28071	28071	0.300	0.160	0.010	0.003	0.270	0.070	0.087	0.044	0.040	0.000	0.000	0.000

Notes: Formado en caliente a 620°C-680°C, enfriado al aire. Formado in hot normalized a 840°C max. Hot formed fittings in a range from 620°C to 980°C, cooled in still air.

Inspector Dimensional: Satisfactorio. Visual dimensional check: Satisfactory

CF: FORMADO EN CALIENTE/HOT FORMED CF: FORMADO EN FRIOCALDO 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.

Certificamos 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 (Tubería 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°. 420901 420901 433886 440948 440948 8025038 412884 383521 329135 8030221 6013292

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.