



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

Numero:
Number: 21792
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Tubos de Acero de México, S.A.
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Vendido a: Sold to: TUVANSA MONTERREY	Pedido del Cliente No: Customers Order No: 4157 - 4671	Lista de Empaque: Packing List: 11123	Fecha/Date: 15 de Diciembre de 2008
Especificaciones y Grados / Standard or Specification and Steel Grade Seamless Fittings according to ASTM A 234 "M" WPB-07, A234 "M" WPB-06a, NACE MR 01.76-2003 Conform to ASME II Ed. 2001 ASME SA-234 "M", 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	T39049	2	TEE 6 CED-XS	293	465	45	116					
2	T39958	13	TEE 6 CED-XS	297	484	33	120					
3	T42086	100	CODO 8 X 45° CED-STD	270	434	36	129					
4	T42086	120	CODO 8 X 90° R.L. CED-STD	270	434	36	129					
5	T41415	18	CODO 16 X 90° R.L. CED-STD	330	500	36	109					
6	T40546	30	RED. CONC. 14 X 10 CED-STD	256	472	30	108					
7	T41224	40	CODO 8 X 90° R.C. CED-STD	338	506	41	120					
8	T42080	35	CODO 8 X 90° R.C. CED-STD	333	495	38	124					
9	T39807	5	RED. CONC. 16 X 14 CED-STD	321	458	37	105					
10	T39736	36	TEE 10 CED-STD	302	466	38	109					
11	S37410	5	CODO 5 X 90° R.L. CED-XS	335	476	40	139					

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	T39049	39049	0.290	0.160	0.670	0.009	0.002	0.270	0.050	0.053	0.011	0.030	0.000	0.000
HF	T39958	39958	0.300	0.170	0.670	0.010	0.002	0.260	0.050	0.058	0.007	0.030	0.000	0.000
HF	T42086	42086	0.300	0.170	0.670	0.009	0.001	0.280	0.050	0.064	0.011	0.030	0.000	0.000
HF	T42086	42086	0.300	0.170	0.670	0.009	0.001	0.280	0.050	0.064	0.011	0.030	0.000	0.000
HF	T41415	41415	0.330	0.190	0.790	0.009	0.001	0.300	0.030	0.048	0.006	0.020	0.000	0.000
CF	T40546	40546	0.310	0.180	0.670	0.009	0.001	0.290	0.050	0.058	0.009	0.030	0.000	0.000
HF	T41224	41224	0.290	0.160	0.670	0.015	0.002	0.280	0.050	0.051	0.019	0.030	0.000	0.000
HF	T42080	42080	0.330	0.180	0.710	0.009	0.001	0.260	0.060	0.067	0.030	0.050	0.009	0.004
CF	T39807	39807	0.310	0.180	0.670	0.008	0.002	0.280	0.050	0.075	0.016	0.030	0.000	0.000
HF	T39736	39736	0.300	0.170	0.680	0.009	0.001	0.270	0.040	0.049	0.011	0.020	0.000	0.000
HF	S37410	37410	0.308	0.170	0.720	0.014	0.001	0.290	0.040	0.038	0.030	0.018	0.001	0.001

Certificamos que los resultados de los Analisis Químicos y Pruebas Mecánicas 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 A108 Grado B con N°: 8028703 8041985 8058416 8058416 8063614 8050710 8059974 8062388 8048263 8041471 257541

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) carts conform to ASTM A108 Grade B N°: 8028703 8041985 8058416 8058416 8063614 8050710 8059974 8062388 8048263 8041471 257541

"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".

<p>Notas:</p> <p>Formado en caliente a 620°C-680°C, enfriado al aire: Formado en frío normalizado a 940°C max.</p> <p>Tiempo de permanencia 10'.</p> <p>Inspección Dimensional: Satisfactoria.</p> <p>HF: FORMADO EN CALIENTE/HOT FORMED</p>	<p>Notas:</p> <p>Hot formed fittings in a range from 620°C to 680°C, cooled in still air.</p> <p>Cold formed normalized at 940°C max.</p> <p>Holding time 10'.</p> <p>Visual dimensional check: Satisfactory</p> <p>CF: FORMADO EN FRIO/COLD FORMED</p>	<p align="center"> Quality Manager / Jefe de Calidad: ING. WALDO GALLEGOS GALVAN </p>	<p>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 80</p> <p>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 80.</p>
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