



Tubos de Acero de México, S.A.  
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**CERTIFICADO DE CALIDAD  
INSPECTION CERTIFICATE**  
( DIN EN 10204:2004E - ISO 10474 3.1.B )

Número:  
Number:  
23559

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Vendido a: Sold to:	PROVEEDORA DE MATERIALES ANGER, S.A. DE C.V.	Pedido del Cliente No: Customers Order No:	5692 - 5712 -	Lista de Empaque: Packing List:	12043	Fecha/Date:	25 de Junio de 2010
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	T49582	12	CODO 14 X 90° R.L. CED-STD	306	494	42	124					
2	T49306	11	CODO 8 X 90° R.L. CED-XS	289	477	43	118					
3	T49307	39	CODO 8 X 90° R.L. CED-XS	304	477	43	116					
4	T49583	18	CODO 12 X 90° R.L. CED-XS	301	492	45	118					
5	T47856	14	CODO 12 X 90° R.L. CED-40	305	481	43	116					
6	T49259	10	TEE RED. 8 X 4 CED-STD	329	490	42	122					
7	T48705	20	TEE RED. 8 X 3 STD	322	485	41	122					

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	T49582	49582	0.310	0.180	0.670	0.011	0.001	0.290	0.010	0.059	0.030	0.030	0.000	0.000
HF	T49306	49306	0.300	0.180	0.660	0.013	0.002	0.290	0.020	0.051	0.017	0.030	0.000	0.000
HF	T49307	49307	0.310	0.180	0.670	0.012	0.002	0.300	0.030	0.046	0.019	0.020	0.000	0.000
HF	T49583	49583	0.310	0.190	0.660	0.016	0.004	0.280	0.020	0.058	0.025	0.030	0.000	0.000
HF	T47856	47856	0.320	0.170	0.790	0.007	0.001	0.290	0.040	0.080	0.025	0.030	0.000	0.000
HF	T49259	49259	0.300	0.170	0.680	0.011	0.002	0.270	0.040	0.073	0.023	0.030	0.000	0.000
HF	T48705	48705	0.310	0.180	0.680	0.010	0.003	0.280	0.040	0.057	0.020	0.030	0.000	0.000

Certificamos que los resultados de los Analisis Quimicos 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 A106 Grado B con N°: 10025049 10027120 10022724 10025820 10016506 10021561 10021566

"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 820°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 820°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.