



**CERTIFICADO DE CALIDAD
INSPECTION CERTIFICATE**

(DIN EN 10204:2004E - ISO 10474.3.1.B)

PROVEEDORA DE MATERIALES ANGER, S.A.

Pedido del Cliente No: 5264 - 5271

Customer Order No: 5264 - 5271

DE C.V.

Dimensiones y tolerancias / Dimension and tolerances

ASME B 16.9 - 2003 and ASME B 16.28 - 1994

Numero: 20952
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Fecha/Date: 2 de Septiembre de 2008

Factura/Invoice: Bocas / Ends
Biselado / Bevelled ends

Vendido a: **PROVEEDORA DE MATERIALES ANGER, S.A.**
Sold to: **DE C.V.**
Especificaciones y Grados / Standard or Specification and Steel Grade
Seamless Filings according to ASTM A 234 W, WPB-87, A234 W, WPB-86, NACE MR 01-75-2003
Conform to ASME II Ed. 2001 ASME SA-234 W Grade WPB, NACE MR0103-2003

DESCRIPCION DE MATERIAL / MATERIAL DESCRIPTION

ART. ITEM	COLADA HEAT CODE	CANTIDAD QUANTITY	DESCRIPCION / DESCRIPTION	ESF. CEDENCIA YIELD STRENGTH (Mpa)	ESF. RUPATURA TENSILE STRENGTH (Mpa)	ELONG. %2"	DUREZA HARDNESS HBW	DIMENSIONES SAMPLE DIM mm	1 Joules	2 Joules	3 Joules	PROMEDIO AVERAGE Joules
1	T22407	16	CODO 6 X 45° CED-XS	319	482	42	113					
2	S25835	14	CODO 6 X 45° CED-XS	244	451	32	122					
3	S27721	75	CODO 4 X 90° R.L. CED-STD	364	509	27	119					
4	S26549	153	CODO 4 X 90° R.L. CED-STD	290	474	32	93					
5	T15180	20	CODO 6 X 90° R.C. CED-STD	357	498	31	118					
6	T34691	26	CODO 6 X 90° R.L. CED-STD	350	485	36	88					
7	T40745	37	CODO 6 X 90° R.L. CED-STD	316	469	40	124					
8	T37363	37	CODO 6 X 90° R.L. CED-STD	351	496	39	94					
9	S21712	60	CODO 4 X 90° R.C. CED-STD	324	470	39	112					
10	S48307	31	CODO 3 X 45° CED-XS	294	467	38	119					
11	S20337	19	CODO 3 X 45° CED-XS	305	480	34	120					

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	T22407	22407	0.310	0.170	0.690	0.010	0.002	0.270	0.050	0.055	0.025	0.030	0.000	0.000
HF	S25835	25835	0.320	0.180	0.750	0.009	0.001	0.290	0.030	0.035	0.010	0.025	0.001	0.001
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
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
HF	T15180	15180	0.000	0.170	0.680	0.010	0.006	0.280	0.050	0.168	0.042	0.060	0.000	0.000
HF	T34691	34691	0.310	0.170	0.680	0.007	0.002	0.280	0.050	0.081	0.025	0.040	0.000	0.000
HF	T40745	40745	0.300	0.170	0.670	0.009	0.002	0.280	0.040	0.044	0.006	0.020	0.000	0.000
HF	T37363	37363	0.310	0.170	0.700	0.008	0.001	0.270	0.070	0.052	0.039	0.030	0.000	0.000
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
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
HF	S20337	20337	0.330	0.190	0.740	0.012	0.001	0.290	0.040	0.031	0.020	0.032	0.000	0.000

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 (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°: 5010786 414268 433886 420901 8024843 7037391 8045575 7060803 373284 347507 370507

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-860°C, enfriado al aire.
Hot formed filings in a range from 820°C to 860°C, cooled in air.
Formado en frío normalizado a 840°C max.
Cold formed normalized at 840°C max.
Tiempo de permanencia 10'.
Holding time 10'.
Inspección Dimensional: Satisfactoria.
Visual dimensional check: Satisfactory
CF: FORMADO EN CALIENTE/HOT FORMED
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 filing. The values of hardness for filings NPS 2, 1/2" and smaller certs obtain from the conversion of hardness Rockwell B to hardness Brinell HBW by means of table WILSON DESK CHART 80. 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.