



GRANT PRIDECO S.A. DE C.V.  
PLANTA VERACRUZ, VER.

QUALITY  
CERTIFICATE

CERTIFICATE No.: FA99/0111  
DATE : October 14, 1999

PURCHASER : FERRETERIA ANAHUAC  
ORDER NUMBER : 10796

SPEC: A-105(ANSI B-16.5,NACE MR-0175-96)  
REGISTER: (BRIDAS) : 13185

PART.	MILL HEAT NUMBER	HEAT No	QUANTITY	STEEL	DESCRIPTION	TRATAMIENTO TERMICO
22	76302	AGGG	20	A-105	BRIDA CUELLO SOLDABLE 300# 3"RF XS	SIN TRATAMIENTO
19	78483	GLLL	1	A-105	BRIDA TRASLAPE 150# 6"	SIN TRATAMIENTO
15	21466	IICI	47	A-105	BRIDA CUELLO SOLDABLE 300# 1 1/2"RF STD	SIN TRATAMIENTO
18		KKMR	50	A-105	BRIDA CIEGA 150# 1 1/2"RF	SIN TRATAMIENTO
17	MMRS	MMRS	41	A-105	BRIDA TRASLAPE 150# 3/4"	SIN TRATAMIENTO
14	80293	MNNN	1	A-105	BRIDA CUELLO SOLDABLE 150# 16"RF STD	SIN TRATAMIENTO
17	NNOW	NNOW	9	A-105	BRIDA TRASLAPE 150# 3/4"	NORMALIZADO
13	80641	OOGO	2	A-105	BRIDA CUELLO SOLDABLE 150# 10"RF STD	SIN TRATAMIENTO
19	80641	OOGO	12	A-105	BRIDA TRASLAPE 150# 6"	SIN TRATAMIENTO
14	80608	OOON	29	A-105	BRIDA CUELLO SOLDABLE 150# 16"RF STD	NORMALIZADO
13	80670	OOOO	8	A-105	BRIDA CUELLO SOLDABLE 150# 10"RF STD	SIN TRATAMIENTO

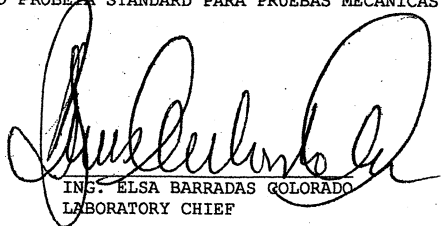
CHEMICAL COMPOSITION: %

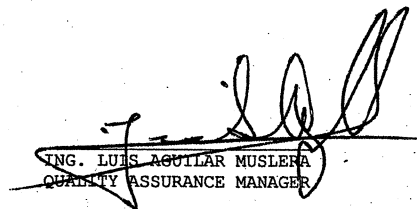
HEAT	C	Mn	Si	P	S	Cr	Mo	Ni	Cu	Nb	V	Al
AGGG	0.237	0.825	0.281	0.007	0.003	0.070	0.028	0.060	0.190	0.001	0.002	0.015
GLLL	0.244	0.818	0.255	0.007	0.005	0.060	0.015	0.060	0.169	0.001	0.002	0.020
IICI	0.288	0.744	0.252	0.009	0.033	0.110	0.011	0.090	0.355	0.001	0.001	0.000
KKMR	0.220	0.880	0.190	0.007	0.004	0.080	0.060	0.060	0.150	0.000	0.000	0.000
MMRS	0.250	1.030	0.200	0.015	0.006	0.080	0.040	0.070	0.210	0.000	0.000	0.000
MNNN	0.235	0.865	0.281	0.008	0.006	0.060	0.016	0.050	0.117	0.004	0.010	0.018
NNOW	0.230	0.890	0.210	0.006	0.005	0.070	0.060	0.030	0.150	0.000	0.000	0.000
OOGO	0.230	0.840	0.290	0.010	0.005	0.040	0.010	0.040	0.130	0.005	0.008	0.019
OOGO	0.230	0.840	0.290	0.010	0.005	0.040	0.010	0.040	0.130	0.005	0.008	0.019
OOON	0.259	0.815	0.259	0.025	0.015	0.090	0.040	0.060	0.185	0.002	0.000	0.015
OOOO	0.241	0.781	0.267	0.008	0.002	0.080	0.054	0.050	0.111	0.000	0.001	0.017
----	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
----	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

MECHANICAL PROPERTIES

HEAT	TENS. STRENGTH(Lb/in <sup>2</sup> )	YIELD STRENGTH(Lb/in <sup>2</sup> )	% ELONGATION	% REDUC.	BHN	IMPACT TEST	
SPEC	70,000 MIN.	36,000 MIN.	22 MIN.	30 MIN.	187 MAX	(LB-FT)	TEMP
AGGG	75,289.00	43,777.00	26.00	55.00	163.00	----	---
GLLL	76,391.00	46,133.00	27.00	45.00	163.00	----	---
IICI	80,817.00	48,416.00	28.00	41.00	163.00	----	---
KKMR	76,700.00	39,793.00	33.00	51.00	156.00	----	---
MMRS	79,144.00	46,549.00	23.00	36.00	170.00	----	---
MNNN	75,147.00	45,595.00	28.00	55.00	163.00	----	---
NNOW	70,781.00	44,173.00	25.00	36.00	156.00	----	---
OOGO	75,885.00	45,022.00	23.00	40.00	149.00	----	---
OOGO	75,885.00	45,022.00	23.00	40.00	149.00	----	---
OOON	76,596.00	51,443.00	22.00	37.00	156.00	----	---
OOOO	74,152.00	42,610.00	24.00	35.00	179.00	----	---

SE UTILIZO PROBETA STANDARD PARA PRUEBAS MECANICAS.

  
ING. ELSA BARRADAS COLORADO  
LABORATORY CHIEF

  
ING. LUIS AGUILAR MUSLERA  
QUALITY ASSURANCE MANAGER