







**YAMATO STEEL CO.**

P.O. BOX 1228  
 FAYETTEVILLE AR 72316

DATE  
 4/21/06

**CERTIFIED MILL TEST REPORT**  
 100% MELTED AND MANUFACTURED IN U.S.A

All shapes produced by Nucor-Yamato Steel are cast and rolled to a fully killed and fine grain practice.

**SOLD TO**

FERRE BARNIEDO, S.A. DE C.V.  
 AV REVOLUCION NO 81  
 SAN CRISTOBAL ECATEPEC  
 EDO DE MEXICO 55000-0000

**SHIP TO**

FERRE BARNIEDO C/O IAF FORWARDING  
 1207 UNIROYAL DRIVE  
 FINAL: SAN LUIS POTOSI, SLP MX  
 LAREDO, TX

INVOICE  
 38640

CUSTOMER NO.  
 5446

BILL OF LADING  
 781828

CUSTOMER P.O.  
 FERRE 24 2ND

2 SPECIFICATIONS GRADE: ASTM A992/A992M-04a A572/A572M GR50-03a ASTM A709/A709M-03a GR50 (345)  
 ASTM A709/A709M-03a GR50S (345S) ASTM A6/A6M-04a

ITEM	ITEM DESCRIPTION	QTY	HEAT #	MECHANICAL PROPERTIES								CHEMICAL PROPERTIES												
				YIELD TO TENSILE RATIO	YIELD STRENGTH F <sub>Y</sub> MPa	TENSILE STRENGTH F <sub>T</sub> MPa	ELONG %	CHARPY IMPACT		C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb	CE			
								TEMP F	IMPACT ENERGY FT-LBS IODLES															
1	W24 -104.0	4	273160	.79	55000	70000	27					.071	.20	.025	.024	.20	.26	.09	.16	.03	.00	.016	.33	
	40'			.79	56000	71000	28														.01	.16		
	W610 x155.0																							
2	12.192 M																							
	W24 -104.0	14	273162	.77	53000	69000	28					.061	.25	.020	.023	.23	.29	.12	.11	.03	.00	.016	.33	
	40'			.79	56000	71000	28														.01	.15		
W610 x155.0																								
3	12.192 M																							
	W24 -104.0	15	273169	.78	56000	72000	26					.081	.21	.022	.023	.25	.37	.10	.11	.03	.00	.016	.34	
	40'			.78	56000	72000	26														.01	.18		
W610 x155.0																								
4	12.192 M																							
	W24 -104.0	3	273174	.79	55000	70000	28					.061	.24	.018	.025	.22	.25	.11	.09	.03	.00	.015	.31	
	40'			.77	55000	71000	27														.01	.14		
W610 x155.0																								
5	12.192 M																							
	W24 -104.0	1	273178	.79	56000	71000	28					.071	.23	.019	.025	.22	.32	.11	.11	.03	.00	.015	.34	
	40'			.77	55000	71000	28														.01	.17		
W610 x155.0																								
5	12.192 M																							
	W610 x155.0																							

ELONGATION BASED ON 8.00 INCH GAUGE LENGTH  
 $P_{cm} = C + Si / 30 + Mn / 20 + Cu / 20 + Ni / 60 + Cr / 20 + Mo / 15 + V / 10 + 5B \text{ B-Approx } .0005$   
 CARBON EQUIVALENT CE =  $C + Mn/6 + (Cr+Mo+V) / 5 + (Ni+Cu) / 15$   
 Corrosion Index:  $CI = 26.01(\%Cu) + 3.88(\%Ni) + 1.2(\%Cr) + 1.49(\%Si) + 17.28(\%P) - 7.29(\%Cu)(\%Ni) - 9.10(\%Ni)(\%P) - 33.39(\%Cu)^2$

I hereby certify that the contents of this report are accurate and correct. All test results and operations performed by this material manufacturer are in compliance with the requirements of the material specifications, and when designated by the purchaser, meet the applicable specifications.

GARY PENNELL  
 QUALITY ASSURANCE

STATE OF ARKANSAS  
 COUNTY OF MISSISSIPPI  
 SWORN TO AND SUBSCRIBED BEFORE ME THIS  
 \_\_\_\_\_ Day of \_\_\_\_\_  
 NOTARY PUBLIC