

Invoice No. 300370
Bill of Lading 300370
Customer No. 7449
Customer P.O. DSA-434880

NUCOR-YAMATO STEEL CO.
 P.O. BOX 1228: BLYTHEVILLE, AR 72316

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
 Date: 2017-10-02

DELTA STEEL
 MILL TEST REPORT DEPT/BURT
 1840 ACKERMAN RD
 SAN ANTONIO TX 78129
 USA

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ASTM A992/A992M-11 A572/A572M GR50-15
 ASTM A709/A709M-15 GR50 (345)
 ASTM A709/A709M-15 GR50S (345S)
 CSA G40.21-13 50WM (345WM)
 ASTM A6/A6M-14

Item#	Item Description	QTY	Heat#	Mechanical Properties				Chemical Properties																	
				Yield to Tensile Ratio	Yield Strength	Tensile Strength	ELONG	Charpy Impact	C	Mn	P	S	Si	Cu	Ni	Cr	Mg	V	Cb	CE	Sn	Pcm	Cl		
				KSI	MPa	KSI	%	Temp	Temp	Temp	%	%	%	%	%	%	%	%	%	%	%	%	%		
1	S12X050.0 40 Ft 0 in 5310X74 (12.19 m)	5	476939	0.76	54	71	24				.07	1.12	.012	.030	.24	.29	.13	.13	.14	.04	.04	.002	.33	.01	.16
2	S20X086.0 40 Ft 0 in 5510X128 (12.19 m)	3	463965	0.79	57	72	25				.06	1.22	.019	.030	.22	.26	.13	.13	.13	.04	.04	.001	.33	.01	.16
3	S20X086.0 40 Ft 0 in 5510X128 (12.19 m)	4	464196	0.80	56	72	25				.06	1.21	.016	.024	.27	.26	.11	.08	.04	.04	.001	.32	.01	.16	
4	S20X086.0 40 Ft 0 in 5510X128 (12.19 m)	2	464197	0.78	57	73	25				.07	1.23	.015	.023	.23	.23	.10	.15	.03	.04	.001	.34	.01	.17	

ELONGATION BASED ON 8.00 INCH GAUGE LENGTH
 Pcm= C+S/30+Mn/20+Cu/20+Ni/60+Cr/20+Mo/15+V/10+Sr/8+Approx. 0.005)
 Corrosion Index= 26.01(Cu)+3.88(Ni)+1.21(Cr)+1.49(Sr)+1.728(P)+7.29(Cu)(%Ni)-9.10(%Ni)(%P)-33.39(%Cu)^2
 ISO 9001:2008 certified (Registration # 0985-07).
 All mechanical testing is performed by the Quality Testing Lab, which is independent of the production departments.

CARBON EQUIVALENT CE= C+Mn/5+(Cr+Mo+V)/5+(Ni+Cu)/15
 Mercury has not been used in the direct manufacturing of this material.
 This material was produced in accordance with the Nucor-Yamato Steel Quality Manual.

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.

Thy Samuel
 Chief Metallurgist

State of Arkansas
 County of Mississippi
 Sworn to and subscribed before me
 on 2017-10-02
 My commission expires on 07/17/2023

