

# INSPECTION CERTIFICATE



SUMITOMO METAL INDUSTRIES, LTD.  
WAKAYAMA STEEL WORKS (KAINAN)  
260-100, FUNOO, KAINAN, JAPAN

CERTIFICATE NO. : BYYJ4686 PAGE: 1 DATE: 2006-11-04

CUSTOMER : BABCOCK AND WILCOX  
ORDER NO. : BAX062311/180D/180DA0000TMF ITEM NO. 170  
SHIPPER : SUMITOMO CORPORATION 057 KEP 2007/2 6P19S075203  
COMMODITY : SEAMLESS ALLOY STEEL BOILER TUBES

STANDARD : ASME 2004 (A05) SA-213 GR. T91  
SPECIFICATION : C030000, 2E4-1708.018 REV. 3, D031247

MILL WORK NO. : BYYJ4686 O. D. : 2.25inch W. T. : 0.35inch LENGTH:25feet 0inch QUANTITY:20pcs. MASS:1768kg

HEAT NO. PRODUCTS PCS.  
F618173 20

HEAT TREATMENT: NORMALIZED & TEMPERED (1922°F X 20min. A.C. & 1436°F X 60min. A.C.)

### CHEMICAL COMPOSITION (%)

	#1	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	Cb	Al	N/Al	#1 L:LADLE ANALYSIS P:PRODUCT ANALYSIS
		#2	#3	#3	#3	#3	#3	#3	#3	#3	#3	#3	#3	#2	
SPEC. MIN.	L	8	20	30	-	-	800	-	85	18	30	6	-	2	#2: X1 #3: X1000 OTHER: X100
MAX.	L	12	50	60	20	10	950	40	105	25	70	10	4	-	
MIN.	P	7	20	30	-	-	800	-	85	18	30	6	-	2	
MAX.	P	14	50	60	20	10	950	40	105	25	70	10	4	-	
HEAT NO.															
F618173	L	9	24	43	12	0	823	12	88	20	44	7	0	11	
	P	10	24	41	12	2	826	12	88	19	45	6	0	45	

### TENSILE TEST HARDNESS TEST

	#1	#2	YS		TS	EL	HB	TYPE OF SPECIMEN FULL SECTION
			#3	#3	#3	%	#4	
SPEC. MIN.	L	B	P	60.0	P	85.0	20	C -
MAX.	L	B	P	-	P	-	-	C 250
HEAT NO.								KIND OF YS
F618173	L	B	P	73.0	P	97.2	43	C 226 C 227

#1 DIRECTION  
L: LONGITUDINAL  
#2 SAMPLING POSITION  
B: BASE METAL  
#3 UNIT  
P: ksi  
HB: HBW  
#4 LOCATION  
C: CROSS SECTION

FLATTENING TEST: ACCEPTABLE

FLARING TEST: ACCEPTABLE

VISUAL & DIMENSIONS: ACCEPTABLE

HYDROSTATIC TEST 2500psi: GUARANTEE (EDDY CURRENT EXAMINATION ACCEPTABLE)

INSIDE SURFACE ROUGHNESS (SPEC. MAX. Ra 250 MICRO INCH): TOP SIDE 158, BOTTOM SIDE 161

WE, HERE CERTIFY THAT THIS MATERIAL IS MIN. WT.

ITEM#/COA#/P/N  
170/AS3900/6264098

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIBED HAS BEEN MANUFACTURED, SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH ABOVE STANDARD AND SPECIFICATION AND SATISFIES THE REQUIREMENTS.

*J. Komoto*

MANAGER, QUALITY ASSURANCE SECTION