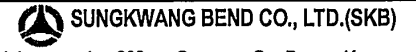


MATERIAL TEST & INSPECTION CERTIFICATE



26, Noksansandan 262-ro, Gangseo-Gu, Busan, Korea
TEL : 82-051-3300-450
FAX : 82-051-3300-335
http://www.sk bend.com

According to

DIN 50049 3.1 / EN 10204 3.1 / ISO 10474 3.1

PURCHASE ORDER NO.	302121-00	SPEC. FOR MATERIAL	ASTM/ASME A/SA234WPB-S 19/21ED	CERTIFICATE NO.	QCLY2022030816
PJT NO.	N/A	SPEC. FOR INSPECTION	ASME B16.9	DATE OF ISSUE	2022.03.16
STARTING MATERIAL	SEAMLESS PIPE	SKB NO.	2021093003	VISUAL & DIMENSION	SATISFACTORY

NO.	SEQ/LINE/ITEM NO	DESCRIPTION					QTY	HEAT NO.	MFG ID NO.	POR/CODE/TAG NO
12		90D ELBOW(L)	STD	14"	B.W SMLS	Black	242	115704	115704	
16		45D ELBOW(L)	X-S	6"	B.W SMLS	Black	630	017324	017324	

CHEMICAL COMPOSITION(%) (L : LADLE, P : PRODUCT)																				TENSILE TEST					
HEAT NO.	STD.	SPEC.	C	SI	Mn	P	S	NI	Cr	Mo	Cu /	V	Nb	N	Al	B	Zr	Fe	Ti	C.E	SPEC.	Y.S.0.2% offset	T.S	EL.	R.A
	MIN		0.10	0.29																	MIN	KSI	KSI	%	%
	MAX		0.30		1.06	0.050	0.058	0.40	0.40	0.15	0.40	0.08									MAX	35.0	60.0	30.0	
017324	L		0.12	0.24	1.06	0.007	0.002	0.03	0.08	0.02	0.06	0.01								0.32		44.7	70.6	39.0	
	P																								
115704	L		0.20	0.22	0.58	0.010	0.003	0.03	0.07	0.01	0.05	0.01								0.32		49.4	77.7	40.0	
	P																								

HEAT NO.	IMPACT TEST	TEST TEMP.	SIZE OF SPECIMEN(mm)	ABSORBED ENERGY STD. /				LATERAL EXPANSION STD. /				PERCENT SHEAR STD. /				HARDNESS HBW		HEAT TREATMENT	HOT FORMED. 870°C, N/A., "Air"		
				VALUE		AVG.	VALUE		AVG.	VALUE		AVG.	MIN	MAX	PMI	N/A	N.D.E		N/A		
017324			B/M												HBW	138	135	FLATTENING TEST	N/A	**MEMO	
			H.A.Z															BENDING TEST	N/A		
			W/M																HYDROSTATIC TEST		N/A
115704			B/M												HBW	147	144	CORROSION TEST	N/A		
			H.A.Z																GRAIN SIZE TEST		N/A
			W/M																HIC TEST		N/A

NACE MR0175 - 2015

WE CERTIFY THIS MATERIAL HAS BEEN MANUFACTURED AND EXAMINED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE SPECIFICATION AND THE RESULTS OF ALL EXAMINATION ARE ACCEPTABLE.

REVIEWED BY
 WITNESSED BY : _____

S. Y. Kim

CHIEF QUALITY OFFICER