

MATERIAL TEST & INSPECTION CERTIFICATE

 **SUNGWANG BEND CO., LTD.(SKB)**

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CUSTOMER: FORGINGS FLANGES & FITTINGS INC.
 PROJECT NAME: N/A

According to

48068

DIN 50049 3.1 / EN 10204 3.1 / ISO 10474 3.1

PURCHASE ORDER NO.	173422	SPEC. FOR MATERIAL	ASTM/ASME A/SA234WPB-S 07/07ED	CERTIFICATE NO.	QCLA2012111122
PJT NO.	N/A	SPEC. FOR INSPECTION	ASME B16.9	DATE OF ISSUE	2012.11.26
STARTING MATERIAL	FORGED MAT'L	SKB NO.	2012072301	VISUAL & DIMENSION	SATISFACTORY

NO.	SEQ/LINE/ITEM NO	DESCRIPTION	QTY	HEAT NO.	MFG ID NO.	POR/CODE/TAG NO
338		STRAIGHT TEE S160 1/2" B.W SMLS Black	60	S94560	S94560	
339		STRAIGHT TEE S160 1" B.W SMLS Black	360	S90576	S90576	

CHEMICAL COMPOSITION(%) (L : LADLE, P : PRODUCT)																		TENSILE TEST(Gauge Length :5D)										
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.	RA			
			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		85.0	
S90576	L		0.17	0.24	0.90	0.013	0.008	0.07	0.18	0.02	0.14	0.001											44.8	75.5	43.0			
	P																											
S94560	L		0.17	0.24	0.87	0.011	0.007	0.05	0.18	0.01	0.15	0.001											49.1	78.4	39.0			
	P																											

HEAT NO.	IMPACT TEST	TEST TEMP.	SIZE OF SPECIMEN(mm)	ABSORBED ENERGY		LATERAL EXPANSION		PERCENT SHEAR		HARDNESS HB		HEAT TREATMENT	HOT FORGED.					
				STD. /	VALUE	AVE.	VALUE	AVE.	STD. /	VALUE	AVE.		MIN	197	PMI	N/A	N.D.E	N/A
S90576			B/M								HB	146	FLATTENING TEST	N/A	**MEMO			
			H.A.Z									BENDING TEST	N/A					
			W/M									HYDROSTATIC TEST	N/A					
S94560			B/M								HB	148	CORROSION TEST	N/A				
			H.A.Z									GRAIN SIZE TEST	N/A					
			W/M									HIC TEST	N/A					

MATERIAL MEETS THE REQUIREMENTS OF NACE MR0175 & 0103 PED(97/23/EC)
 MATERIAL ALL MANUFACTURED IN KOREA.

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 : _____


 QM DIV. SENIOR MANAGING DIRECTOR

Inv# 439430; PO# 88; Ht# S90576; 1 S160 TEE WPB