

# MATERIAL TEST CERTIFICATE

## ( EN 10204 - 3.1 )



Certificate No.: FT202204-042-001  
 Date : 2022/04/01  
 P.O No. : 297013  
 MPS. No. :

Felix MR No. : O202108-022 Rev. 0  
 Mat'l Specification : ASTM A182 F304/304L-21/ASME SA182 F304/304L-2021ED  
 Customer : TEXAS PIPE & SUPPLY COMPANY, LTD.  
 Project Name :

85, Mieumsandan 3-ro, Gangseo-gu, Busan, Korea  
 Tel : +82-51-796-7870 (REP.)

Description	Lot No	Tensile Test * 1						Hardness (HB)	Impact Test				Bend Test	Material Code	
		Specimen		Y.S	T.S	E.L	R.A		Temp.	Notch	Unit				
		D	G.L	MPa		%			-196°C	2V	J				
		Size : 10x10x55(mm)							Min.	27	Avg.				
Total Q'ty : 1,515 EA Q'ty (EA)		Spec Max Min			205	515	30	50	237						
9 B16.5 #150 SO RF 1 1/2"	1,310	CC25A4(T2)	T	6.25	25.0	294.3	596.3	62.2	74.6	145 / 147	132.4	157.8	141.9	144	
15 B16.5 #150 BL RF 1 1/2"	70														
30 B16.5 #150 LJ - 1 1/2"	135														
***** BLANK *****															

Heat No	Spec	Chemical Composition(%) * 3												
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	N	Al
		Min	-	-	-	-	8.0	18.0						0.10
S45079	Max	0.030	1.00	2.00	0.045	0.030	11.0	20.0						
	H	0.019	0.471	1.476	0.0324	0.0071	8.496	18.187					0.0680	
	P													

**REMARK**  
 No repair welding was performed on the products.  
 Mercury Free, Radioactive Free  
 NACE MR0103/ISO 17945-2015 & MR0175/ISO 15156-2015  
 ~22HRC Max. (=237HB)  
 Country of Melted : Republic of Korea / E.A.F+A.O.D  
 Country of Forging : Republic of Korea  
 ISO 9001:2015 - Cert' No.153040-2014-AQ-KOR-RvA (By DNV GL)  
 PED:2014/68/EU - Cert' No.5591-2014-CE-KOR Rev.1 (By DNV GL)

Heat Treatment *4 S : 1050°C X 2Hrs W.C	Dimension & Visual	NDE		
		UT	MT	PT
		ACCEPT	N/A (N/A)	N/A (N/A)

We hereby certify that the material herein has been manufactured, tested and inspected in accordance with the above specification.

\_\_\_\_\_  
Surveyor
\_\_\_\_\_  
Manager / QC Team

Notes :  
 ※ 1 -- Tensile Test : Y.S=Yield Strength, T.S=Tensile Strength, E.L=Elongation, R.A=Reduction of Area, G.L=Gauge Length(mm), D=Diameter(φ)  
 ※ 2 -- Location : L=Longitudinal, Tr=Transverse, T=Tangential, R=Radial, U=Hubbed Tension Test 6.25×25.0mm (ASME SEC VIII Div.1 PARA UW-13.3)  
 ※ 3 -- Chemical Composition : H=Heat Analysis, P=Product Analysis  
 ※ 4 -- Heat Treatment : N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S=Solution Treated, S.R=Stress Relieved, S.T=Stabilization Heat Treatment, A.C=Air Cooled, W.C=Water Cooled, F.C=Furnace Cooled, O.C=Oil Cooled, AC C=Accelerated Cooled By Water  
 CE : C + (Mn/5) + [(Cr+Mo+V)/5] + (Ni+Cu)/15

