NIPPON STEEL & SUMITOMO METAL CORPORATION

INSPECTION CERTIFICATE

HEAD OFFICE 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
KASHIMA WORKS 3, HIKARI, KASHIMA-CITY, IBARAKI-PREF., 314-0014, JAPAN

DATE OF ISSUE : 2018-06-27

CERTIFICATE NO. : YU6046 REFERENCE NO. : JAQR-EI00012

SHIPPER : MITSUI & CO., LTD.

CUSTOMER :

COMMODITY : SAWL CARBON STEEL LINE PIPE

SPECIFICATION : DNV-OS-F101 (2013) SAWL GR.450 FD MODIFIED

CUSTOMER'S CONTROL NO. :

NSSMC DOC. : MP005K-18 REV.3, QP005K-18 REV.1

CONTRACT NO.	SIZE			DELIVERY QUANTITY	
8-841-N3-5-7-JZ15-01	O.D. or I.D.	WALL THICKNESS	LENGTH	QUANTITY	MASS
CONTROL NO. KYYU6046	O.D. 508.0	22.2	MIN12.0M MAX12.4M	1,714PCS 21,173.620M	NOMI. 5631124KG

COMBINED CONTROL NO.	VISUAL & DIMENSION	HYDROSTATIC TEST	
		37.6 MPA	ULTRASONIC TEST : GOOD RADIOGRAPHIC TEST : GOOD PLATE UST : GOOD PIPE END UST : GOOD PIPE END MPI : GOOD RESIDUAL MAGNETISM (AVE. 1.5MT) : GOOD
	GOOD	10SEC. GOOD	

NOTES: ASKELADD PROJECT

HARDNESS TEST : REFER TO ATTACHED SHEET-1
MACROGRAPHIC EXAMINATION : REFER TO ATTACHED SHEET-2
STRESS LEVEL AT RP0.2 AND AT ELONGATION OF 1%, 2% AND RM REPORT : REFER TO ATTACHED SHEET-3

MPQT REPORT : REFER TO DOCUMENT NO. TR072K-18
WPQT REPORT : REFER TO DOCUMENT NO. PQR030K-18
RWPQT REPORT : REFER TO DOCUMENT NO. RPQR010K-18

Jun. 27, 2018
S. Watanabe
Reviewed page 1~53

SURVEYOR TO

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.

K. Hasegawa

KAZUHIKO HASEGAWA
HEAD OF DEPARTMENT, QUALITY ASSURANCE DEPT.
KASHIMA WORKS

TO BE CONTINUED

RESULTS OF CHEMICAL AND MECHANICAL PROPERTIES

DATE OF ISSUE : 2018-06-27
CERTIFICATE NO.: YU6046
CONTRACT NO. : 8-841-N3-5-7-JZ15-01

CUSTOMER :
SIZE : OD 508.0 X WT 22.2 SPEC.: DNV-OS-F101 (2013) SAWL GR.450 FD MODIFIED
HEAT NO.: 8520111 (66PCS) CUSTOMER'S CONTROL NO.:

TEST NO.			CHEMICAL COMPOSITION (MASS %)																					
			X100			X1000		X100					X1000			X10000								
* 1	* 2	* 8	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	Al	N	B	*11	*12	*13	*14	*15	*16	*17	*18
8520111	L		6	12	178	10	2	2	2	19	1	0	14	21	30	34	0	0	29	9	4				16
R0994AA	P		6	12	178	10	2	2	2	18	1	0	14	22	29	33	0	0	26	8	4				16
SPEC. MIN	L																			2					
SPEC. MAX	L		8	45	185	20	10	50	50	50	50	9	60	50	60	120	5				15				22
SPEC. MIN	P																			2					
SPEC. MAX	P		8	45	185	20	10	50	50	50	50	9	60	50	60	120	5				15				22
SPEC. MIN																									
SPEC. MAX																									

TEST NO.							TENSILE TEST					BEND TEST
* 1	* 3	* 4	* 5	* 6	* 7	* 8	YS	TS	EL	YR	RA	
							(MPA)		(%)			
R0994AA	O	L	R	2	1	F	492	554	459	888		
	H	T	R	2	1	F	473	575	435	823		
	W	T	R			F		617				GOOD
SPEC. MIN	O	L	R	2	1	F	450	535	300			
SPEC. MAX	O	L	R	2	1	F	570	760		930		
SPEC. MIN	H	T	R	2	1	F	450	535	290			
SPEC. MAX	H	T	R	2	1	F	570	760		930		
SPEC. MIN	W	T	R			F		535				
SPEC. MAX	W	T	R			F		760				

TEST NO.								TENSILE TEST					BEND TEST
* 1	* 3	* 4	* 5	* 6	* 7	* 8		YS	TS	EL	YR	RA	
								(MPA)		(%)			
SPEC. MIN													
SPEC. MAX													
SPEC. MIN													
SPEC. MAX													
SPEC. MIN													
SPEC. MAX													

TEST NO.							TEST TEMP	IMPACT TEST / DWTT												REMARKS
								ENERGY (JOULE)				SHEAR FRACTURE (%)				LATERAL EXPANSION (				
* 1	* 9	* 3	* 4	* 10	* 8		(°C)	1	2	3	AVG	1	2	3	AVG	1	2	3	AVG	
R0994AA	C	O	T	2	S	-	330	313	441	401	385									
	C	W	T	2	G	-	330	180	200	182	187									
	C	N	T	2	G	-	330	238	430	442	370									FL
	C	N	T	2	G	-	330	264	288	253	268									FL+2MM
	D	O	T	F	F	-	230					100	100		100					
SPEC. MIN	C	O	T	2	S	-	330			60	60									
SPEC. MIN	C	W	T	2	G	-	330			38	45									
SPEC. MIN	C	N	T	2	G	-	330			38	45									
SPEC. MIN	C	N	T	2	G	-	330			38	45									
SPEC. MIN	D	O	T	F	F	-	230							75	85					
SPEC. MIN																				
SPEC. MIN																				
SPEC. MIN																				

NOTES1 *1 First 5 digits of TEST NO. indicates last 5 digits of Pipe No.(6 digits) *2 Type of Analysis(L=Ladle(T=Top, M=Middle, B=Bottom), P=Product Analysis of B.M., W=Product Analysis of W.M.) *3 Location(O=90° from the Weld, H=180° from the Weld, W=Weld, N=HAZ) *4 Orientation(L=Longitudinal, T=Transverse) *5 Shape of Test Specimen (R=Rectangular Tensile Test Specimen, B=Round Bar Tensile Test Specimen) *6 Kind of YP or YS(1=0.2% offset, 2=0.5% Total Elongation, U=Upper YP, L=Lower YP) *7 Gauge Length(1=2in.(50mm), 2=8in.(200mm), 5=5d, 6=5.65√A) *8 Test Position((Weld & HAZ: G=Outside, C=Center, N=Inside), (B.M.: 1=1/4t, 2=1/2t, 3=3/4t, F=Full Thickness, S=Surface)) *9 Type of IMPACT TEST / DWTT(C=Charpy Impact Test, D=DWTT) *10 Specimen Size(Impact Test Specimen(2mmV type: 2=10mm Full, F=3/4Sub., G=2/3Sub., H=1/2Sub., J=1/3Sub.), (2mmU type: 3=10mm, L=3/4Sub., 5=2/3Sub., M=1/2Sub., 6=1/3Sub.)), (DWTT(F=Full Wall Thickness of API RP 5L3., R=Reduced Wall Thickness of API RP 5L3))

NOTES2 *11 CA(X10000) *12 SOL.AL(X1000)
*13 SOL.AL/N (X1) *14 NB+V+TI (X100)
*18 C+SI/30+MN/20+CU/20+NI/60+CR/20+MO/15+V/10+5B (X100)

FOR EACH REDUCTION OF 0.01% BELOW THE SPECIFIED MAXIMUM FOR CARBON, AN INCREASE OF 0.05% ABOVE THE SPECIFIED MAXIMUM FOR MANGANESE IS PERMISSIBLE, UP TO A MAXIMUM INCREASE OF 0.20%.