

INSPECTION CERTIFICATE

CERTIFICATE NO. :BYYF0265-01

PAGE : 1/8

DATE :2021-05-25

CUSTOMER :SPIRIT ENERGY
 ORDER NO. :4500638434(21-MSCT-10-130874)
 SHIPPER :SUMITOMO CORPORATION 057 KEN-7082/1 1-845-N3-5-5-FK57-01
 COMMODITY :SEAMLESS HOT FINISHED STAINLESS STEEL TUBING WITH VAM TOP HC
 STANDARD :SM13CRS-110 (NIPPON STEEL STD.)
 SPECIFICATION :TSP-4116R2
 MILL WORK NO. :BYYF0265 O.D.:5-1/2inch W.T.:20.00lb/ft LENGTH:MIN.11.90m MAX.12.50m
 QUANTITY:219pcs. TOTAL LENGTH:2671.53m MASS:78650kg

HEAT NO. :F01C068 F112032 F112035 F112042 F122072 F122073
 PRODUCTS PCS. :2 53 6 13 118 27

HEAT TREATMENT :QUENCHED & TEMPERED

CHEMICAL COMPOSITION(%)

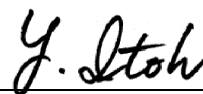
		*1	C	Si	Mn	P	S	Cr	Ni	Mo	Ti	V
						*3	*3	*2	*2	*2		
SPEC. MIN.		R	-	-	-	-	-	115	50	15	1	-
MAX.		R	3	50	50	20	5	135	65	30	50	50
HEAT NO.												
F01C068		L	1	24	37	15	0	120	54	19	10	5
		P	1	25	37	15	1	119	54	19	10	5
F112032		P	1	25	37	15	1	120	54	19	10	5
		L	1	24	41	12	0	122	56	19	10	5
		P	1	24	42	15	1	122	55	19	10	6
F112035		P	1	24	42	14	1	122	55	19	10	5
		L	1	24	43	14	0	120	54	19	10	5
		P	1	25	43	14	1	121	54	19	10	5
F112042		P	1	25	43	14	1	121	54	19	10	5
		L	1	24	42	14	0	121	56	19	10	5
		P	1	25	42	16	0	121	56	19	10	6
F122072		P	1	25	41	16	0	121	55	19	9	6
		L	1	23	42	15	0	120	54	20	10	6
		P	1	23	42	15	1	120	53	19	10	6
F122073		P	1	23	43	16	1	120	54	19	10	6
		L	1	26	42	16	0	120	55	19	10	5
		P	1	27	43	17	0	120	55	19	10	5
		P	1	27	42	16	0	120	55	19	10	5

*1 R:LADLE & PRODUCT ANALYSIS L:LADLE ANALYSIS P:PRODUCT ANALYSIS *2:X10 *3:X1000 OTHER:X100

TENSILE TEST

		*1	*2	YS	YS	TS	TS	EL				
				*3	*3	*3	*3	%				
SPEC. MIN.	HEAT-	L	B	M	758	P	110.0	M	758	P	110.0	15
MAX.	LOT NO.	L	B	M	862	P	125.0	M	-	P	-	-
HEAT NO.												
F01C068	701	L	B	M	802	P	116.3	M	834	P	121.0	28
	701	L	B	M	800	P	116.0	M	832	P	120.7	25

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



YUJIN ITO

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TENSILE TEST

SPEC. MIN. MAX.	HEAT- LOT NO.	*1 *2		YS *3		YS *3		TS *3		TS *3		EL %
		L B L B	M M	758 862	P P	110.0 125.0	M M	758 -	P P	110.0 -	15 -	
HEAT NO. F112032	003	L B	M	795	P	115.3	M	843	P	122.3	26	
	003	L B	M	809	P	117.3	M	845	P	122.6	25	
F112035	004	L B	M	795	P	115.3	M	838	P	121.5	25	
	004	L B	M	793	P	115.0	M	834	P	121.0	25	
F112042	702	L B	M	814	P	118.1	M	845	P	122.6	25	
	702	L B	M	808	P	117.2	M	843	P	122.3	23	
F122072	001	L B	M	811	P	117.6	M	847	P	122.8	25	
	001	L B	M	816	P	118.4	M	851	P	123.4	24	
	002	L B	M	797	P	115.6	M	841	P	122.0	24	
	002	L B	M	832	P	120.7	M	865	P	125.5	26	
F122073	703	L B	M	812	P	117.8	M	859	P	124.6	24	
	703	L B	M	832	P	120.7	M	862	P	125.0	25	

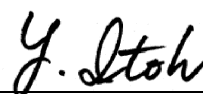
TYPE OF SPECIMEN:STRIP 25.4mm(1in.) WIDTH *1 SAMPLING DIRECTION L:LONGITUDINAL *2 SAMPLING POSITION B:BASE METAL
 *3 UNIT M:MPa P:ksi GAUGE LENGTH:50.8mm(2.0in.) KIND OF YS:0.6% EXTENSION UNDER LOAD

IMPACT TEST(-10.0°C +14.0°F 2mm V-Notch 10X7.50)

SPEC. MIN. MAX.	HEAT- LOT NO.	*1 *2		*3 *4			AVG	*3 *4			AVG	
		L B L B	E J E J	*5 [1]	19/28 [2]	-/- [3]	28 -	E F [1]	*5 [2]	14/21 [3]	21 -	
HEAT NO. F01C068	701	L B	E J	187	200	213	200	E F	138	148	157	148
F112032	003	L B	E J	188	166	181	178	E F	139	122	133	131
F112035	004	L B	E J	179	190	198	189	E F	132	140	146	139
F112042	702	L B	E J	162	162	172	165	E F	119	119	127	122
F122072	001	L B	E J	168	165	160	164	E F	124	122	118	121
	002	L B	E J	174	181	180	178	E F	128	133	133	131
F122073	703	L B	E J	169	182	169	173	E F	125	134	125	128

SPEC. MIN. MAX.	HEAT- LOT NO.	*1 *2		*3 *4			AVG
		L B L B	S % S %	*6 [1]	- [2]	- [3]	- -
HEAT NO. F01C068	701	L B	S %	100	100	100	100
F112032	003	L B	S %	100	100	100	100
F112035	004	L B	S %	100	100	100	100
F112042	702	L B	S %	100	100	100	100
F122072	001	L B	S %	100	100	100	100
	002	L B	S %	100	100	100	100
F122073	703	L B	S %	100	100	100	100

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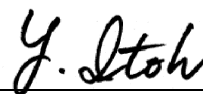
NO.264427K21



[1] [2] [3]: SPECIMEN NO.
ABSORBED ENERGY
*5:ABSOLUTE SINGLE VALUE / SINGLE VALUE (ONE CAN BE BELOW AVG) AVG:AVERAGE VALUE OF ONE SET(3 PIECES)
SHEAR AREA *6:VALUE OF ONE PIECE AVG:AVERAGE VALUE OF ONE SET(3 PIECES)
*1 SAMPLING DIRECTION L:LONGITUDINAL *2 SAMPLING POSITION B:BASE METAL *3 E:ABSORBED ENERGY S:SHEAR AREA
*4 UNIT J:Joule F:ft·lbf %:%

VISUAL & DIMENSIONS: ACCEPTABLE
DRIFT TEST: ACCEPTABLE (SPECIAL LENGTH:42in.)
HYDROSTATIC TEST 69.0MPa(10000psi)X5sec.: ACCEPTABLE
ULTRASONIC EXAMINATION(PIPE BODY & PIPE ENDS): ACCEPTABLE
APPLICABLE STANDARD: ISO SEC.10
REFERENCE STANDARD: L2 EXTERNAL & INTERNAL LONGITUDINAL & TRANSVERSE NOTCH LENGTH 50mm(2.0in.) WIDTH 1mm(0.040in.)
MAGNETIC PARTICLE EXAMINATION(PIPE ENDS): ACCEPTABLE
APPLICABLE STANDARD: ISO SEC.10
REFERENCE STANDARD: BRUMAH CASTROL EXTERNAL & INTERNAL LONGITUDINAL & TRANSVERSE
ULTRASONIC WALL THICKNESS CHECK: ACCEPTABLE
SR16: ACCEPTABLE

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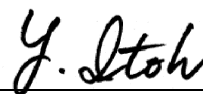


HARDNESS TEST(HRC)

SPEC. MIN. MAX.	HEAT- LOT NO.	*1 *2 *3	*4 *5	*V.A.											
				AVG.				OUTER WALL IMPRESSION NO.				INNER WALL IMPRESSION NO.			
				QUAD -RANT	(1)	(2)	(3)	AVG.	(1)	(2)	(3)	AVG.			
		B C	T	-	-	-	-	-	-	-	-	-	-	-	
		B C		-	32.0										
F01C068	701	B C	T	25.9	A 25.7	25.8	26.0	25.8	26.0	25.8	26.0	25.9	0.1		
	701	B C	B	25.9	A 25.8	26.1	26.1	26.0	25.7	25.7	25.8	25.7	0.3		
F112032	003	B C	T	26.2	A 25.9	26.1	26.3	26.1	26.1	26.1	26.7	26.3	0.2		
	003	B C	B	26.3	A 26.5	26.4	26.4	26.4	26.3	26.0	26.3	26.2	0.2		
F112035	004	B C	T	25.4	A 25.3	25.1	25.6	25.3	25.1	25.5	25.7	25.4	0.1		
	004	B C	B	26.0	A 25.4	26.3	25.9	25.9	26.0	26.2	26.4	26.2	0.3		
F112042	702	B C	T	27.2	A 27.4	27.2	27.5	27.4	26.9	27.1	27.1	27.0	0.4		
	702	B C	B	26.3	A 26.9	26.4	26.5	26.6	26.7	25.7	25.8	26.1	0.5		
F122072	001	B C	T	26.2	A 26.0	25.8	26.7	26.2	26.4	26.1	26.2	26.2	0.0		
	001	B C	B	26.8	A 26.6	26.7	27.0	26.8	26.5	27.0	26.9	26.8	0.0		
	002	B C	T	26.4	A 26.4	26.8	26.1	26.4	26.4	26.5	26.5	26.5	0.1		
	002	B C	B	26.6	A 27.2	27.2	27.0	27.1	26.6	26.1	25.8	26.2	0.9		
F122073	703	B C	T	27.2	A 26.8	26.8	26.9	26.8	27.3	27.7	27.4	27.5	0.7		
	703	B C	B	27.5	A 27.6	27.5	27.3	27.5	27.4	27.7	27.5	27.5	0.0		
		*ALL		26.4											

*1 SAMPLING POSITION B:BASE METAL *2 LOCATION C:CROSS SECTION *3 SAMPLING LOCATION T:TOP B:BOTTOM *4 EACH
 *5 AVERAGE *V.A.:VARIATION AVERAGE MAX.-MIN. * ALL:ALL AVG.

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PAGE : 5/8 DATE : 2021-05-25

TEMPERING TEMPERATURE

HEAT NO.	PRODUCT PCS. (PCS.)	HEAT LOT/NO.	SETTING TEMPERING TEMPERATURE (°C)
F01C068	2	701	605
F112032	53	003	605
F112035	6	004	605
F112042	13	702	605
F122072	69	001	605
F122072	49	002	605
F122073	27	703	605
TOTAL	219		

REMARKS : TEMPERING TEMPERATURE CONTROL RANGE : SETTING TEMPERATURE +, -10° C

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INSPECTION CERTIFICATE(COUPILING)

CERTIFICATE NO. :BYF0265-01

PAGE : 6 / 8 DATE :2021-05-25

MATERIAL WORK NO. :BCFF1539

HEAT TREATMENT:QUENCHED & TEMPERED

CHEMICAL COMPOSITION(%)

		*1	C	Si	Mn	P	S	Cr	Ni	Mo	Ti	V
						*3	*3	*2	*2	*2		
SPEC. MIN.		R	-	-	-	-	-	115	50	15	1	-
MAX.		R	3	50	50	20	5	135	65	30	50	50
HEAT NO.												
F111060		L	1	23	43	14	0	121	56	19	10	5
		P	1	24	44	15	1	121	56	19	10	5
		P	1	24	44	15	1	120	56	19	10	5

*1 R:LADLE & PRODUCT ANALYSIS L:LADLE ANALYSIS P:PRODUCT ANALYSIS *2:X10 *3:X1000 OTHER:X100

TENSILE TEST

		*1	*2	YS	YS	TS	TS	EL				
				*3	*3	*3	*3	%				
SPEC. MIN.	HEAT-	L	B	M	758	P	110.0	M	758	P	110.0	13
MAX.	LOT NO.	L	B	M	862	P	125.0	M	-	P	-	-
HEAT NO.												
F111060	701	L	B	M	808	P	117.2	M	842	P	122.1	24
	701	L	B	M	806	P	116.9	M	842	P	122.1	24

TYPE OF SPECIMEN:ROUND BAR 12.7mm(0.5in.) DIAMETER *1 SAMPLING DIRECTION L:LONGITUDINAL

*2 SAMPLING POSITION B:BASE METAL *3 UNIT M:MPa P:ksi GAUGE LENGTH:50.8mm(2.0in.)

KIND OF YS:0.6% EXTENSION UNDER LOAD

IMPACT TEST(-10.0°C +14.0°F 2mm V-Notch 10X10)

		*1	*2	*3	*4	AVG	*3	*4	AVG						
SPEC. MIN.	HEAT-	T	B	E	J	*5	19/28	28	E	F	*5	14/21	21		
MAX.	LOT NO.	T	B	E	J	-/-	-	-	E	F	-/-	-	-		
				[1]	[2]	[3]			[1]	[2]	[3]				
HEAT NO.															
F111060	701	T	B	E	J	140	145	137	141	E	F	103	107	101	104
		*1	*2	*3	*4	AVG									
SPEC. MIN.	HEAT-	T	B	S	%	*6	-	-							
MAX.	LOT NO.	T	B	S	%	-	-	-							
				[1]	[2]	[3]									
HEAT NO.															
F111060	701	T	B	S	%	75	75	66	72						

[1] [2] [3]: SPECIMEN NO.

ABSORBED ENERGY

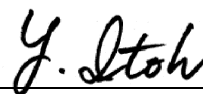
*5:ABSOLUTE SINGLE VALUE / SINGLE VALUE (ONE CAN BE BELOW AVG) AVG:AVERAGE VALUE OF ONE SET(3 PIECES)

SHEAR AREA *6:VALUE OF ONE PIECE AVG:AVERAGE VALUE OF ONE SET(3 PIECES)

*1 SAMPLING DIRECTION T:TRANSVERSE *2 SAMPLING POSITION B:BASE METAL *3 E:ABSORBED ENERGY S:SHEAR AREA

*4 UNIT J:Joule F:ft•lbf %:%

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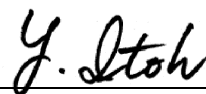
VISUAL & DIMENSIONS: ACCEPTABLE

MAGNETIC PARTICLE EXAMINATION: ACCEPTABLE

APPLICABLE STANDARD: ISO SEC.9

REFERENCE STANDARD: JIS Z 2320 TYPE A1 EXTERNAL & INTERNAL LONGITUDINAL

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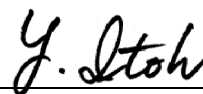
DATE :2021-05-25

HARDNESS TEST(HRC)

		*1 *2 *3	*4 *5															*V.A.
SPEC. MIN. MAX.		B C	- -															-
		B C	- 32.0															-
HEAT NO.	HEAT- LOT NO.		AVG.	OUTER WALL				MID WALL				INNER WALL						
				QUAD	IMPRESSION NO.			IMPRESSION NO.			IMPRESSION NO.							
				-RANT	(1)	(2)	(3)	AVG.	(1)	(2)	(3)	AVG.	(1)	(2)	(3)	AVG.		
F111060	701	B C T	26.3	A	25.9	25.7	25.9	25.8	26.4	26.8	26.7	26.6	26.4	26.5	26.1	26.3	0.8	
	701	B C B	26.3	A	26.1	26.4	26.5	26.3	26.5	26.0	26.2	26.2	26.0	26.3	26.4	26.2	0.1	
		*ALL	26.3															

*1 SAMPLING POSITION B:BASE METAL *2 LOCATION C:CROSS SECTION *3 SAMPLING LOCATION T:TOP B:BOTTOM *4 EACH
 *5 AVERAGE *V.A.:VARIATION AVERAGE MAX.-MIN. * ALL:ALL AVG.

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