CERTIFICATE NO(성적서 번호) : A903628
DATE OF ISSUE(발행일자) : 2016-09-23
CONTRACT(P/O) NO.(계약번호) : 23753
PR NO.(주문서번호) : F160600022
COMMODITY(제품명) : ERW/HFI CARBON STEEL PIPE
SPECIFICATION(제품규격) : API 5L B PSL1/ASTM A53B

검사증명서
MILL TEST CERTIFICATE
EN 10204 3.1/ISO 10474 3.1B

HYUNDAI STEEL
울산공장 : 울산광역시 북구 염포로 706
706, Yeompo-ro, Buk-gu, Ulsan, Korea

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS., S.A. DE C.V.

No.	TYPE OF PIPE END ※1	SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이)	PCS (본)	WEIGHT (KG)	TOTAL LENGTH (F)	HEAT No.	Hydrostatic Test Pressure PSI	Hydrostatic Test Time SEC	Spec. Min. / Max.	※2	Tensile Strength Base Mpa	Tensile Strength Weld Mpa	Yield Strength Mpa	Y/R Rate %	E.L %	※3	Hardness Test	※2	Specimen size	CVN Impact Test(℃) Absorbed Energy(Joule) 1	2	3	avg	Shear Area (%)	D.W.T Test(℃) Shear Area(%) 1	2	avg
									Min.		415	415	245														
									Max.											Criteria : In the case of 10×10)							
1	EB BE	10-3/4" X 0.250 " X 21.000 F	234	63,047	4,914	G52283	1000	5		T	466	500	323		41												
2	EB BE	10-3/4" X 0.365 " X 21.000 F	155	60,022	3,255	G51803	1450	5		T	476	513	356		41												
3	EB BE	12-3/4" X 0.225 " X 21.000 F	379	108,800	7,959	N96718	750	5		T	471	470	351		40												
4	EB BE	12-3/4" X 0.250 " X 21.000 F	177	56,759	3,717	N96718	840	5		T	475	476	351		40												
		- -																									

Chemical Composition(%) 2:×100 3:×1000 4:×10000

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9		
				≤	2	-2	3	3	2	2	2	2	2	2	2	4	2	2		
		Min.																		
		Max.		26		120	30	30	50	50	50	15				10	6	15		
1	G52283		H	16	2	70	16	4												
			P	12	2	71	16	6	5	2	4	TR	TR	TR	TR	1	TR	1		
			P	12	2	71	16	6	5	2	4	TR	TR	TR	TR	1	TR	1		
2	G51803		H	16	2	76	13	7												
			P	11	2	75	14	8	4	2	4	TR	TR	TR	TR	1	TR	TR		
			P	11	2	75	14	8	4	2	4	TR	TR	TR	TR	1	TR	TR		
3	N96718		H	6	1	76	14	5												
			P	3	2	79	14	6	2	1	3	TR	TR	TR	1	1	1	2		
			P	4	2	78	13	6	2	1	3	TR	TR	TR	1	1	1	2		
4	N96718		H	6	1	76	14	5												
			P	10	21	93	12	6	1	1	25	TR	TR	TR	TR	2	1	1		
			P	10	22	93	12	6	1	1	25	TR	TR	TR	TR	1	1	1		

No.	Heat No.	Zn-Coating Test: Zn Coating	Copper Sulfate Test: Time	Copper Sulfate Test: Result	HC-Test Collapse Pressure psi	H.I.C Test CLR %	CTR %	CSR %	S.S.C.C Test
1	G52283								
2	G51803								
3	N96718								
4	N96718								

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max. for C, an increase of 0.05% above the specified max. for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ API 5L Annex.E(N.D.E) : O.D<6":ECT(1.6mm hole), O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100'c, Holding time : max30m/min)

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Heat Treatment	Non-Destructive Test (U.T)	Flattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

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SURVEYOR

H.K.CHOI
QA Manager

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PR NO.(주문서번호) : F160600022
COMMODITY(제품명) : ERW/HFI CARBON STEEL PIPE
SPECIFICATION(제품규격) : API 5L B PSL1/ASTM A53B

검사증명서
MILL TEST CERTIFICATE
EN 10204 3.1/ISO 10474 3.1B

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS., S.A. DE C.V.

HYUNDAI STEEL
울산공장 : 울산광역시 북구 염포로 706
706, Yeompo-ro, Buk-gu, Ulsan, Korea

No.	TYPE OF PIPE END ※1	SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이)	PCS (본)	WEIGHT (KG)	TOTAL LENGTH (F)	HEAT No.	Hydrostatic Test Pressure (PSI)	Hydrostatic Test Time (SEC)	Spec. Min. / Max.	Tensile Properties (Gage Length : 2 inch) ※2	Tensile Strength Base (Mpa)	Tensile Strength Weld (Mpa)	Yield Strength (Mpa)	Y/R Rate (%)	E.L (%)	Hardness Test & CVN Impact Test ※3	Hardness Test	CVN Impact Test(℃) ※2 Specimen size	Absorbed Energy(Joule) 1	2	3	avg	Shear Area (%)	D.W.T Test(℃) Shear Area(%) 1	2	avg
									Min.		415	415	245													
									Max.										Criteria : In the case of 10×10)							
5	EB BE	12-3/4" X 0.406 " X 21.000 F	5	2,549	105	N80479	1350	5		T	481	490	378		44											
6	EB BE	12-3/4" X 0.406 " X 21.000 F	40	20,395	840	N94397	1350	5		T	473	453	384		43											
7	EB BE	12-3/4" X 0.406 " X 21.000 F	23	11,727	483	N95807	1350	5		T	469	465	378		45											
8	EB BE	12-3/4" X 0.406 " X 21.000 F	41	20,906	861	N95812	1350	5		T	480	475	400		43											

Chemical Composition(%) 2 :×100 3 :×1000 4 :×10000

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9		
				≤	2	-2	3	3	2	2	2	2	2	2	2	4	2	2		
		Min.																		
		Max.		26		120	30	30	50	50	50	15				10	6	15		
5	N80479		H	6	16	94	12	3												
			P	4	16	95	12	4	1	2	3	1	TR	TR	1	3	1	2		
			P	4	16	96	12	4	1	2	3	1	TR	TR	1	3	1	2		
6	N94397		H	6	2	75	14	6												
			P	5	1	78	12	7	1	1	3	TR	TR	TR	2	1	2	2		
			P	4	2	77	13	7	1	1	3	TR	TR	TR	2	1	2	2		
7	N95807		H	6	1	74	12	5												
			P	4	1	73	10	6	1	1	3	TR	TR	TR	2	1	2	2		
			P	4	1	73	10	6	1	1	3	TR	TR	TR	2	1	2	2		
8	N95812		H	6	1	73	12	6												
			P	4	1	74	12	7	1	1	3	TR	TR	TR	2	1	2	2		
			P	4	1	74	12	8	2	1	3	TR	TR	TR	2	1	2	2		

No.	Heat No.	Zn-Coating Test: Zn Coating	Copper Sulfate Test: Time	Copper Sulfate Test: Result	HC-Test Collapse Pressure (psi)	H.I.C Test CLR (%)	CTR (%)	CSR (%)	S.S.C.C Test
5	N80479								
6	N94397								
7	N95807								
8	N95812								

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max. for C, an increase of 0.05% above the specified max. for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ API 5L Annex.E(N.D.E) : O.D<6":ECT(1.6mm hole), O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100℃, Holding time : max30m/min)

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Heat Treatment	Non-Destructive Test (U.T)	Flattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

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SPECIFICATION(제품규격) : API 5L B PSL1/ASTM A53B

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EN 10204 3.1/ISO 10474 3.1B

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS., S.A. DE C.V.

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울산공장 : 울산광역시 북구 염포로 706
706, Yeompo-ro, Buk-gu, Ulsan, Korea

No.	TYPE OF PIPE END ※1	SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이)	PCS (본)	WEIGHT (KG)	TOTAL LENGTH (F)	HEAT No.	Hydrostatic Test Pressure PSI	Hydrostatic Test Time SEC	Spec. Min. / Max.	※2	Tensile Strength Base Mpa	Tensile Strength Weld Mpa	Yield Strength Mpa	Y/R Rate %	E.L %	※3	Hardness Test	※2	CVN Impact Test(℃) Specimen size	Absorbed Energy(Joule) 1	2	3	avg	Shear Area (%)	D.W.T Test(℃) Shear Area(%) 1	2	avg
									Min.		415	415	245				-										
									Max.											Criteria : In the case of 10×10)							
9	EB BE	14" X 0.250 " X 21.000 F	269	94,904	5,649	N96707	770	5		T	474	467	390		40												
10	EB BE	14" X 0.250 " X 21.000 F	68	23,990	1,428	N96718	770	5		T	477	452	392		40												
11	EB BE	14" X 0.312 " X 21.000 F	1	434	21	N95816	950	5		T	466	467	381		41												
12	EB BE	14" X 0.312 " X 21.000 F	40	17,346	840	N96707	950	5		T	471	475	390		44												

Chemical Composition(%) 2:×100 3:×1000 4:×10000

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9			Zn Coating	Copper Sulfate Test Time	Copper Sulfate Test Result	HC-Test Collapse Pressure	CLR	CTR	CSR	S.S.C.C Test
				2	2	-2	3	3	2	2	2	2	2	2	2	4	2	2						psi	%	%	%	
		Min.																										
		Max.		26		120	30	30	50	50	50	15				10	6	15										
9	N96707		H	7	2	73	10	3																				
			P	5	2	74	9	4	1	1	2	TR	TR	TR	1	1	1	2										
			P	5	2	74	9	4	2	1	2	TR	TR	TR	1	1	1	2										
10	N96718		H	6	1	76	14	5																				
			P	4	1	76	12	6	1	1	3	TR	TR	TR	1	1	1	2										
			P	4	1	76	12	6	1	1	3	TR	TR	TR	1	1	1	2										
11	N95816		H	6	2	76	13	7																				
			P	6	2	78	12	8	2	1	3	TR	TR	TR	1	1	1	2										
			P	6	2	77	12	8	2	1	3	TR	TR	TR	2	1	2	2										
12	N96707		H	7	2	73	10	3																				
			P	5	2	73	9	4	1	1	2	TR	TR	TR	1	1	1	1										
			P	4	2	74	9	4	1	1	2	TR	TR	TR	1	1	1	1										

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max. for C, an increase of 0.05% above the specified max. for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ API 5L Annex.E(N.D.E) : O.D<6":ECT(1.6mm hole), O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100℃, Holding time : max30m/min)

Heat Treatment	Non-Destructive Test (U.T)	Rattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

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									Min.		415	415	245														
									Max.											Criteria : In the case of 10×10)							
13	EB BE	14" X 0.312 " X 21.000 F	111	48,135	2,331	N97150	950	5		T	451	461	363		45												
14	EB BE	14" X 0.500 " X 21.000 F	1	687	21	N16823	1520	5		T	530	522	524		40												
15	EB BE	14" X 0.500 " X 21.000 F	31	21,308	651	N95807	1520	5		T	478	482	411		42												
16	EB BE	16" X 0.250 " X 21.000 F	8	3,232	168	1673005460	670	5		T	469	495	323		41												

Chemical Composition(%) 2 :×100 3 :×1000 4 :×10000

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9			Zn Coating	Copper Sulfate Test Time	Copper Sulfate Test Result	HC-Test Collapse Pressure psi	H.I.C Test CLR %	CTR %	CSR %	S.S.C.C Test
				~2	2	~2	3	3	2	2	2	2	2	2	2	4	2	2										
		Min.																										
		Max.		26		120	30	30	50	50	50	15				10	6	15										
13	N97150		H	5	1	74	12	4																				
			P	4	1	72	12	6	1	1	2	TR	TR	TR	1	1	1	1										
			P	4	1	71	11	6	1	1	2	TR	TR	TR	1	1	1	1										
14	N16823		H	6	16	100	15	2																				
			P	6	15	100	15	5	2	2	3	TR	TR	TR	3	2	3	3										
			P	6	16	100	15	4	2	2	3	TR	TR	TR	3	2	3	3										
15	N95807		H	6	1	74	12	5																				
			P	5	1	73	11	6	1	1	3	TR	TR	TR	2	1	2	2										
			P	5	1	75	11	7	1	1	3	TR	TR	TR	2	1	2	2										
16	1673005460		H	8	19	69	16	7																				
			P	6	18	69	14	7	2	2	23	TR	TR	1	1	2	1	3										
			P	6	18	70	14	6	2	2	23	TR	TR	1	1	1	1	3										

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max.
for C, an increase of 0.05% above the specified max.
for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ API 5L Annex.E(N.D.E) : O.D<6":ECT(1.6mm hole), O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100'c, Holding time : max30m/min)

COPY

Heat Treatment	Non-Destructive Test (U.T)	Flattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

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SURVEYOR

H.K. CHOI
QA Manager

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PR NO.(주문서번호) : F160600022
COMMODITY(제품명) : ERW/HFI CARBON STEEL PIPE
SPECIFICATION(제품규격) : API 5L B PSL1/ASTM A53B

검사증명서
MILL TEST CERTIFICATE
EN 10204 3.1/ISO 10474 3.1B

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS., S.A. DE C.V.

HYUNDAI STEEL
울산공장 : 울산광역시 북구 염포로 706
706, Yeompo-ro, Buk-gu, Ulsan, Korea

No.	TYPE OF PIPE END ※1	SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이)	PCS (본)	WEIGHT (KG)	TOTAL LENGTH (F)	HEAT No.	Hydrostatic Test Pressure PSI	Hydrostatic Test Time SEC	Spec. Min. / Max.	※2	Tensile Strength Base Mpa	Tensile Strength Weld Mpa	Yield Strength Mpa	Y/R Rate %	E.L %	※3	Hardness Test	※2	Specimen size	CVN Impact Test(℃) Absorbed Energy(Joule) 1	2	3	avg	Shear Area (%)	D.W.T Test(℃) Shear Area(%) 1	2	avg
	※1		(본)	(KG)	(F)		PSI	SEC	Min.		Mpa	Mpa	Mpa	%	%												
									Max.		415	415	245							Criteria : in the case of 10×10)							
17	EB BE	16" X 0.250 " X 21.000 F	75	30,303	1,575	N98659	670	5		T	449	485	329		42												
18	EB BE	16" X 0.250 " X 21.000 F	49	19,798	1,029	SP51089	670	5		T	490	497	344		37												
19	EB BE	16" X 0.250 " X 21.000 F	20	8,081	420	SP55654	670	5		T	481	551	297		43												
20	EB BE	16" X 0.500 " X 21.000 F	33	26,043	693	N98632	1330	5		T	467	475	406		42												

Chemical Composition(%) 2 :×100 3 :×1000 4 :×10000

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9
				2	2	-2	3	3	2	2	2	2	2	2	2	4	2	2
		Min.																
		Max.		26		120	30	30	50	50	50	15				10	6	15
17	N98659		H	5	2	79	13	5										
			P	4	2	80	13	6	2	1	3	1	TR	TR	1	1	1	1
			P	4	2	79	13	6	2	1	3	TR	TR	TR	1	1	1	1
18	SP51089		H	16	1	82	9	3										
			P	11	1	79	8	5	1	1	2	TR	TR	TR	TR	1	TR	TR
			P	11	1	79	8	5	1	1	2	TR	TR	TR	TR	1	TR	TR
19	SP55654		H	16	15	110	12	3										
			P	13	14	108	11	4	1	1	3	TR	TR	TR	TR	2	TR	TR
			P	13	14	109	11	4	1	1	3	TR	TR	TR	TR	2	TR	1
20	N98632		H	6	2	74	13	6										
			P	4	1	74	14	8	2	1	3	TR	TR	TR	2	1	2	2
			P	4	1	74	13	8	2	1	3	TR	TR	TR	2	1	2	2

No.	Heat No.	Zn-Coating Test: Zn Coating	Copper Sulfate Test: Time	Copper Sulfate Test: Result	HC-Test Collapse Pressure psi	H.I.C Test CLR %	CTR %	CSR %	S.S.C.C Test
17	N98659								
18	SP51089								
19	SP55654								
20	N98632								

Heat Treatment	Non-Destructive Test (U.T)	Flattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max.
for C, an increase of 0.05% above the specified max.
for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ API 5L Annex.E(N.D.E) : O.D<6":ECT(1.6mm hole). O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100'c, Holding time : max30m/min)

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SPECIFICATION(제품규격) : API 5L B PSL1/ASTM A53B

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HYUNDAI STEEL
울산공장 : 울산광역시 북구 염포로 706
706, Yeompo-ro, Buk-gu, Ulsan, Korea

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS., S.A. DE C.V.

No.	TYPE OF PIPE END ※1	SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이)	PCS (본)	WEIGHT (KG)	TOTAL LENGTH (F)	HEAT No.	Hydrostatic Test Pressure (PSI)	Hydrostatic Test Time (SEC)	Spec. Min. / Max.	※2	Tensile Strength Base (Mpa)	Tensile Strength Weld (Mpa)	Yield Strength (Mpa)	Y/R Rate (%)	E.L (%)	※3	Hardness Test	※2	Specimen size	CVN Impact Test(℃) Absorbed Energy(Joule) 1	2	3	avg	Shear Area (%)	D.W.T Test(℃) Shear Area(%) 1	2	avg
									Min.		415	415	245														
									Max.											Criteria : In the case of 10×10)							
21	EB BE	18" X 0.250 " X 21.000 F	114	51,902	2,394	SB61540	600	5		T	470	468	309		42												
22	EB BE	18" X 0.375 " X 21.000 F	48	32,216	1,008	G51477	890	5		T	468	504	323		45												
23	EB BE	18" X 0.375 " X 21.000 F	2	1,342	42	G51478	890	5		T	474	499	324		44												
24	EB BE	20" X 0.375 " X 21.000 F	34	25,411	714	N98641	800	10		T	474	475	371		42												

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9			Zn Coating	Copper Sulfate Test Time	Copper Sulfate Test Result	HC-Test Collapse Pressure	CLR	CTR	CSR	S.S.C.C Test
				Chemical Composition(%)																	Zn-Coating Test			HC-Test	H.I.C Test			
				2:×100 3:×1000 4:×10000																								
				´2	2	´2	3	3	2	2	2	2	2	2	2	4	2	2				Time	Result	psi	%	%	%	
		Min.																										
		Max.		26		120	30	30	50	50	50	15				10	6	15										
21	SB61540		H	15	1	68	15	5																				
			P	12	1	64	12	6	3	2	3	1	TR	TR	TR	1	TR	TR										
			P	12	1	66	12	6	3	2	3	1	TR	TR	TR	1	TR	TR										
22	G51477		H	16	2	78	18	5																				
			P	11	2	76	16	5	4	2	4	TR	TR	TR	TR	1	TR	1										
			P	11	2	76	16	5	4	2	4	TR	TR	TR	TR	1	TR	1										
23	G51478		H	16	2	77	16	4																				
			P	12	2	76	16	6	5	2	4	TR	TR	TR	TR	1	TR	TR										
			P	12	2	78	17	6	5	2	4	TR	TR	TR	TR	1	TR	TR										
24	N98641		H	6	1	76	12	5																				
			P	3	2	77	11	6	2	1	3	TR	TR	TR	2	1	2	2										
			P	3	2	77	11	6	2	1	3	TR	TR	TR	2	1	2	2										

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max. for C, an increase of 0.05% above the specified max. for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ API 5L Annex.E(N.D.E) : O.D<6":ECT(1.6mm hole), O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100℃, Holding time : max30m/min)

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Heat Treatment	Non-Destructive Test (U.T)	Flattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

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No.	TYPE OF PIPE END ※1	SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이)	PCS (본)	WEIGHT (KG)	TOTAL LENGTH (F)	HEAT No.	Hydrostatic Test Pressure PSI	Hydrostatic Test Time SEC	Spec. Min. / Max.	※2	Tensile Strength Base Mpa	Tensile Strength Weld Mpa	Yield Strength Mpa	Y/R Rate %	E.L %	※3	Hardness Test	※2	Specimen size	CVN Impact Test(℃) Absorbed Energy(Joule) 1	2	3	avg	Shear Area (%)	D.W.T Test(℃) Shear Area(%) 1	2	avg
									Min.		415	415	245														
									Max.											Criteria : In the case of 10×10)							
25	EB BE	20" X 0.375 " X 21.000 F	9	6,727	189	N99034	800	10		T	474	468	360		43												
26	EB BE	20" X 0.500 " X 21.000 F	22	21,843	462	N98641	1070	10		T	471	472	379		42												
		TOTAL	1,989	777,907	41,769																						

Chemical Composition(%) 2:×100 3:×1000 4:×10000

No.	Heat No.	Spec.	※4	C	Si	Mn ※7	P	S	Cu	Ni	Cr	Mo	V	Ti	Nb	B	CM1 ※8	CM2 ※9		
				2	2	-2	3	3	2	2	2	2	2	2	2	4	2	2		
		Min.																		
		Max.		26		120	30	30	50	50	50	15				10	6	15		
25	N99034		H	6	1	77	15	7												
			P	4	1	80	12	9	2	1	2	1	TR	TR	2	1	2	2		
			P	5	2	81	15	8	2	1	2	TR	TR	TR	2	1	2	2		
26	N98641		H	6	1	76	12	5												
			P	2	2	77	11	6	2	1	3	TR	TR	TR	2	1	2	2		
			P	3	2	77	11	6	2	1	3	TR	TR	TR	2	1	2	2		

Zn-Coating Test: Zn Coating	Copper Sulfate Test Time	Copper Sulfate Test Result	HC-Test Collapse Pressure psi	H.I.C Test CLR %	CTR %	CSR %	S.S.C.C Test

Heat Treatment	Non-Destructive Test (U.T)	Flattening	Visual & Dimension	Residual Magnetism (Gauss)
GOOD	GOOD	GOOD	GOOD	GOOD

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