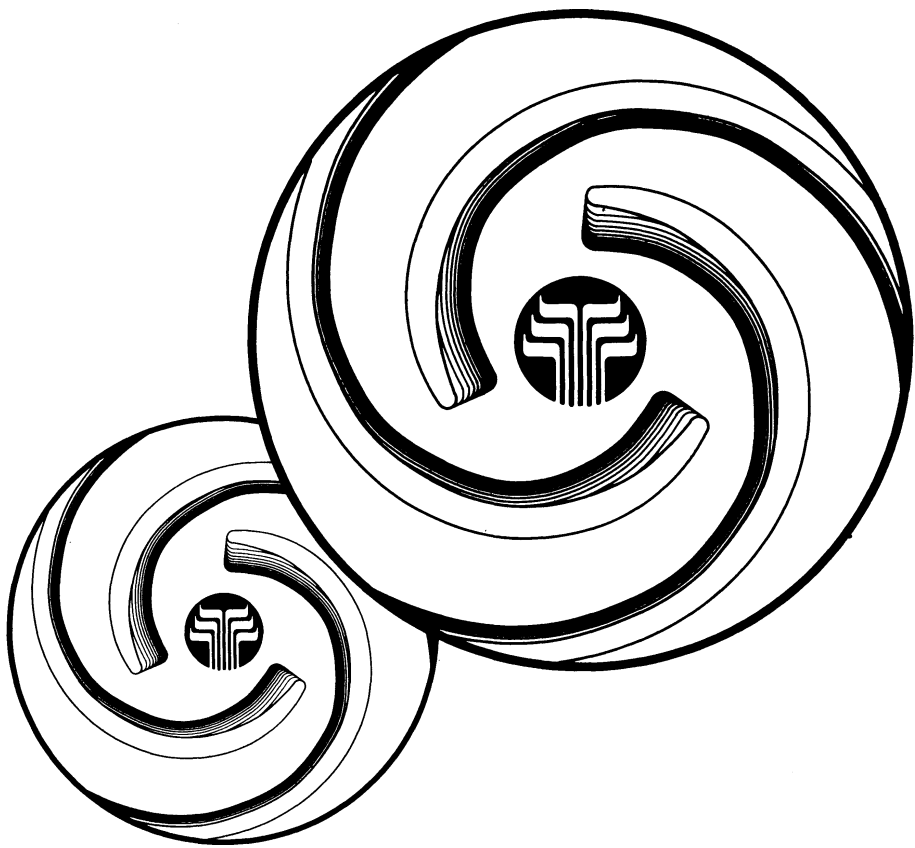


효성펌프편람

HEC PUMP HAND BOOK



효성EBARA주식회사
HYOSUNG EBARA CO., LTD.

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1)

(KS D 4301)

		mm	kg f/ mm ²	kg f/ mm ²	HB	ASTM	BS	DIN	JIS
2	GC150	4 8	-	19	241	A 48 - 76	1452- 77	1691- 64	G5501 FC150
		8 15		17	223				
		15 30		15	212				
		30 50		13	201				
3	GC200	4 8	-	24	255	30	180	0.6020 GG - 20	FC200
		8 15		22	235				
		15 30		20	223				
		30 50		17	217				
4	GC250	4 8	-	28	269	35	260	0.6025 GG - 25	FC250
		8 15		26	248				
		15 30		25	241				
		30 50		22	229				
5	GC300	8 15	-	31	269	40	300	0.6030 GG - 30	FC300
		15 30		30	262				
		30 50		27	248				

2) (KS D 4302)

		mm	kgf/mm ²	kgf/mm ²	HB	ASTM	BS	DIN	JIS
1	GCD 400	-	26	40	201	A 536-77 60-40-18	2789-73 420/12	1693-73 0.7040 GGG-40	G 5502-75 FCD40
2	GCD 450	-	29	45	143 217	65-45-12			FCD45
3	GCD 500	-	33	50	170 241		2789-73 500/7	1693-73 0.7040 GGG-50	FCD50
4	GCD 600	-	38	60	192 269	A 536-77 80-55-06	600/3	0.7040 GGG-60	FCD60

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1) (KS D 4101)

		kgf/mm ²	kgf/mm ²	HB	C	P	S	ASTM	BS	DIN	JIS
2	SC410	21	42	-	0.30	0.04	0.04	A 27-77 60-30 GS 38	3100-76 A 1	1681-67 1.0443	G 51011-78 SC 42
3	SC450	23	46	-	0.35	0.04	0.04	65-35 GS 45	A 2	1.0443	SC 46
4	SC480	25	49	-	0.40	0.04	0.04	70-36 GS 52	A 3	1.0551	SC 49

2)

(KS D 4103)

	kg f / mm ²	kg f / mm ²	HB	C	Si	Mn	P	S	Ni	Cr	Mo	Cu		ASTM	BS	DIN	JIS
SSC1	35	55	163	0.15	1.50	1.00	0.040	0.040	(1)	11.50	-	-	-	A 743- 79 CA 15	3100- 76 410C21	17445- 69 1.4008 G- X 12 Cr 14	G5121- 80 SC S1
			229							14.00							
SSC2	40	60	170	0.16	1.50	1.00	0.040	0.040	(1)	11.50	-	-	-	CA 40	420C29	1.4027 G- X 20 Cr 14	SC S2
			235	0.24						14.00							
				(1) 1% 가													
SSC11	35	60	241	0.10	1.50	1.00	0.040	0.040	5.00 7.00	23.00 27.00	1.50 2.50	-	-			1.4460 X 8CrNi Mo275	SC S11
SSC13	19	45	183	0.08	2.00	2.00	0.040	0.040	8.00	18.00	-	-	-	A 743- 79	3100- 76	17445- 69 1.4308 G- X 6Cr	SC S13
									11.00	21.00				CF8	304C15	Ni189	
SSC13	19	45	183	0.08	2.00	2.00	0.040	0.040	10.00	17.00	2.00	-	-			1.4408 G- X 6Cr	SC S14
									14.00	20.00	3.00			CF8M	316C16	NiMo1810	
SSC14	19	45	183	0.03	1.50	2.00	0.040	0.040	12.00	17.00	2.00	-	-			17440 1.4435 X 2CrNi	SC S16
									16.00	20.00	3.00			CF3M	316C12	Mo- 1812	
SSC16	18	40	183	0.03	2.00	2.00	0.040	0.040	8.00	17.00	-	-	-			1.4306 X 2CrNi	SC S19
									12.00	21.00				CF3	304C12	189	
SSC21	21	49	183	0.08	2.00	2.00	0.040	0.040	9.00	18.00	-	-	Nb+Ta 10x C%			1.4552 G- X 7Cr	SC S21
									12.00	21.00			1.35	CF8C		NiNb 189	
SSC22	21	45	183	0.08	2.00	2.00	0.040	0.040	10.00	17.00	2.00	-	Nb+Ta 10x C%		3100- 76		SC S22
									14.00	20.00	3.00		1.35		318C17		
SSC23	17	40	183	0.07	2.00	2.00	0.040	0.040	27.50	19.00	2.00	3.00	-	A 743- 79			SC S23
									30.50	22.00	3.00	4.00		CN7M			
SSC24	105	126	375	0.07	1.00	1.00	0.040	0.040	3.00	15.50	-	2.50	Nb+Ta 0.15	CB 7			SC S24
									5.00	17.50		4.00	0.45	Cu - 1			

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1) (KS D 6002)

		kgf/mm ²	HB	Cu	Sn	Zn	Pb		ASTM	BS	DIN	JIS	KS
2	BC2	25	-	86.0 90.0	7.0 9.0	3.0 5.0	1.0	1.0	B584-79 C903			H5111 BC2	BrC1
3	BC3	25	-	86.5 89.5	9.0 11.0	1.0 3.0	1.0	1.0	C905	1400 - 73 G1	1705-73 2.1086.01 G- CuSn10Zn	BC3	BrC2
6	BC6	20	-	82.0 87.0	4.0 6.0	4.0 6.0	4.0 6.0	2.0	C836	LG2	2.1096.01 G- CuSn- 5ZnPb	BC6	BrC3

2) (KS D 6010)

		kgf/mm ²	HB	Cu	Sn	P			ASTM	BS	DIN	JIS	
2	PBC2	20	60	87.0 91.0	9.0 12.0	0.05 0.20	1.0		B505-78 907	1400-73 PB4	1705-73 2.105.01 G- CuSn5ZnPb	H5113-79 PBC2	

3) (KS D 6015)

		kgf/mm ²	HB 10/1000	Cu	Al	Fe	Ni	Mn		ASTM	BS	DIN	JIS
1	AlBC1	45	90	85.0	8.0 10.0	1.0 4.0	1.0	1.0	0.5	B148-78 952	1400-73 AB1	1714-73 2.0940.01 G- CuAl10Fe	H5114-79 AlBC1
2	AlBC2	50	120	78.0	8.0 10.5	2.5 5.0	1.0 3.0	1.5	0.5	954		2.0970.01 G- CuAl9Ni	AlBC2
3	AlBC3	60	150	78.0	8.5 10.5	3.0 6.0	3.0 6.0	1.5	0.5	958	1400-73 AB2	2.0975.01 G- CuAl10Ni	AlBC3

4) (KS D 6011)

3	PbBC3	kgf/mm ²	HB	Cu	Sn	Pb	Ni				ASTM	BS	DIN	JIS
		-	10/500					Zn	Fe					
3	PbBC3	-	60	77.0	9.0	9.0	1.0	1.0	0.3	1.0	B584-79 937	1400-73 LB2	1716-73 2.1176.01	H5115-79 LBC3
				81.0	11.0	11.0							G-CuPb10Sn	
4	PbBC4	-	55	74.0	7.0	14.0	1.0	1.0	0.3	1.0	938	LB1	2.1182.01	
				78.0	9.0	16.0							G-CuPb15Sn	LBC4

5) (KS D 6001)

2	BsC2	kg f mm ²	HB	Cu	Zn	Pb	Sn	Al	Fe	ASTM	BS	DIN	JIS
		20	-	65.0 70.0		0.5 3.0	1.0	0.5	0.8	B584- 79 C584	1400- 73 SCB3	1709- 73 G- Cu Zn33Pb	H5101- 79 YBsC2
3	BsC3	25	-	60.0 65.0		0.5 3.0	1.0	0.5	0.8	C587	DCB3	G- Cu Zn37Pb	YBsC3

6) (KS F 6008)

3	A AC3A	kgf/mm ²	HB	Cu	Si	Mg	Zn	Fe	Mn	Ni	Ti	Pb	Sn	Cr	Al	ASTM	BS	DIN	JIS
		18	50	0.25 13.0	10.0	0.15	0.3	0.8	0.35	0.1	0.2	0.1	0.1	0.15			1490-70 LM6	1725/2-73 G-A1Si12	H5202 AC3A

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1) (KS D 3752)

	Kg f/ mm ²	Kg f/ mm ²	HB	C	Si	Mn	P	S	ASTM	BS	DIN	JIS
SM30C	N	N	N	0.27	0.15	0.60	0.030	0.035	A108-73	970-73		G4501-79
	29	48	137 197	0.33	0.35	0.90			1030	080A30		S30C
SM35C	N	N	N	0.32	0.15	0.60	0.030	0.035				
	31	52	149 207	0.38	0.35	0.90			1035	080A35		S35C
SM45C	N	N	N	0.42	0.15	0.60	0.030	0.035		080M46		
	35	58	167 229	0.48	0.35	0.90			1045	080A47		S45C

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2) CrMo (KS D 3711)

	Kg f/ mm ²	Kg f/ mm ²	HB	C	Si	Mn	P	S	Cr	Mo	ASTM	BS	DIN	JIS
SCM 415	-	85	235	0.13	0.15	0.60	0.03	0.03	0.90	0.15				G 4105-79
			321	0.18	0.35	0.85			1.20	0.30				SCM 415
SCM 420	-	95	262	0.18	0.15	0.60	0.03	0.03	0.90	0.15				
			352	0.23	0.35	0.85			1.20	0.30				SCM 420
SCM 435	80	95	269	0.33	0.15	0.60	0.03	0.03	0.90	0.15			1.7220	
			331	0.38	0.35	0.85			1.20	0.30	4135	708A37	34CrMo4	SCM 435
SCM 440	85	100	285	0.38	0.15	0.60	0.03	0.03	0.90	0.15	A 322-64a	970-70	1700-69	
			352	0.43	0.35	0.85			1.20	0.30	4140	708M40	1.7225 42CrMo4	SCM 440

3) NiCr (KS D 3708)

	Kg f/ mm ²	Kg f/ mm ²	HB	C	Si	Mn	P	S	Cr	Mo	ASTM	BS	DIN	JIS
SNC631	70	85	248	0.27	0.15	0.35	0.030	0.030	2.50	0.60		970-70	1.5736	G4102-79
			302	0.35	0.35	0.65			3.00	1.00		653M31	36NiCr10	SNC631
SNC836	80	95	269	0.328	0.15	0.35	0.030	0.030	3.00	0.60			1.5755	
			321	0.40	0.35	0.65			3.50	1.00			31NiCr14	SNC836

4) (KS D 3503)

1 SS400	Kg f/mm ²			HB	C	Mn	P	S	ASTM	BS	DIN	JIS
	cm			41 52	-	-	0.050	0.050	A36- 77a A283- 78	4360- 79	17100- 66	G3101- 76
	16	16 40	40									
	25	24	22									
								C	40A		SS400	

5) (KS D 3507)

SSP	Kg f/ mm ²	Kg f/ mm ²	P	S	ASTM	BS	DIN	JIS
	-	30	0.040	0.040	A 53- 78 F	1387- 67 BW22	2400- 78 2411- 78 1.0033 St- 33- 1	G3452- 78 SGP

6) (KS D 3562)

2	SPPS38	Kgf/mm ²	Kgf/mm ²	C	Si	Mn	P	S	ASTM	BS	DIN	JIS
		22	38	0.25	0.35	0.30	0.040	0.040	A 53- 48 E	3601- 74 ERW360	1629(1) - 61 St37	G3454- 78 ST PG38
3	SPPS42	25	42	0.30	0.35	0.30	0.040	0.040	E	ERW410	St42	ST PG42

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1) (KS D 3706)

S T S 304	K g / m ²	K g / m ²	H B	C	S i	M n	P	S	N i	C r	M o	A S T M	B S	D I N	J I S
	21	53										A 276- 76	970- 70	17440- 72	G 4303- 81
			187	0.08	1.00	2.00	0.045	0.030	8.00	18.00	-	304	304S15	1.4301 X5CrNi-189	SU S304
S T S 304L	18	49	187	0.03	1.00	2.00	0.045	0.030	9.00	18.00	-	304L	304S12	1.4306 X2CrNi-189	SU S304L
S T S 316	21	53	187	0.08	1.00	2.00	0.045	0.030	10.00	16.00	2.00	316	316S16	1.4401 X5CrNi-Mo1810	SU S316
S T S 316L	18	49	187	0.03	1.00	2.00	0.045	0.030	12.00	16.00	2.00	316L	316S12	1.4401 X2CrNi-Mo1810	SU S316L
S T S 321	21	53	187	0.08	1.00	2.00	0.045	0.030	9.00	17.00	-	321	321S12	1.4541 X10CrNiTi189	SU S321
S T S 329J1	40	60	(1) T i5× C %									A 240- 77			SU S329J1
			277	0.08	1.00	1.50	0.040	0.030	3.00	23.00	1.00				
									6.00	28.00	3.00	329			
S T S 403	40	60										A 276- 75	970- 70	17440- 72 1.4024 X15Cr13	SU S403
			170	0.15	0.50	1.00	0.040	0.030	(1)	11.50	-				
										13.00		403	403S17		
S T S 416	35	55	159	0.15	1.00	1.25	0.060	0.150	(1)	12.0	0.6% 가	A 582- 75			
										14.00		416	416S20		SU S416
S T S 420J1	45	65	192	0.16	1.00	1.00	0.040	0.03	(1)	12.00	-			17440- 72 1.4021 X20Cr13	SU S420J1
				0.25						14.00		420	420S37		
S T S 420J2	55	75	217	0.26	1.00	1.00	0.040	0.030	(1)	12.00	-				
				0.40						14.00			420S45		SU S420J2
S T S 431	60	80	229	0.20	1.00	1.00	0.040	0.03	1.25	15.00	-	A 276- 75		17440- 72 1.4057 X22CrNi17	
									2.50	17.00		431	431S29		SU S431
			(1) N I 0.6%												

2)

(KS D 3705)

	K g f / m m ²	K g f / m m ²	H B	C	S i	M n	P	S	N i	C r	M o	A S T M	B S	D I N	J I S
S T S 304												A 164 - 74	1449-75	17440-72	G4304-81
	21	53	187	0.08	1.00	2.00	0.045	0.030	8.00	18.00	-	304	304S15	1.4301 X5CrNi-189	SUS304
S T S 304L															
	18	49	187	0.30	1.00	2.00	0.045	0.030	9.00	18.00	-	304L	304S12	1.4301 X2CrNi-189	SUS304L
S T S 316															
	21	53	187	0.08	1.00	2.00	0.045	0.030	10.00	16.00	2.00	316	316S16	1.4401 X5CrNi-189	SUS316
S T S 316L															
	18	49	187	0.03	1.00	2.00	0.045	0.030	12.00	16.00	2.00	316L	316S12	1.4401 X2CrNi-Mo1810	SUS316L

3)

(KS D 3576)

	K g f / m m ²	K g f / m m ²	H B	C	S i	M n	P	S	N i	C r	M o	A S T M	B S	D I N	J I S
S T S 304T P												A 312-79a	3605-73		G3459-78
	21	53	-	0.08	1.00	2.00	0.040	0.030	8.00	18.00	-	TP 304			SUS304TP
S T S 304L T P															
	18	49	-	0.03	1.00	2.00	0.040	0.030	9.00	18.00	-	TP 304L			SUS304LTP
S T S 316T P															
	21	53	-	0.08	1.00	2.00	0.040	0.030	10.00	16.00	2.00	TP 316			SUS316TP
S T S 316L T P															
	18	49	-	0.03	1.00	2.00	0.040	0.030	12.00	16.00	2.00	TP 316L			SUS316LTP

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	(HRL)	(SRL)
	1.10 1.50	1.00 1.80
(kgf/cm ²)	200 600	50 250
(%)	2.0 25.0	250 650
	D 60 90	JIS A 35 80
(kgf/cm ²)	700 1000	-
(kgf/cm ²)	550 850	-
(kg f · cm /cm)	10 20	-
(Ω · cm)	10 ¹³ 10 ¹⁵	10 ¹⁰ 10 ¹⁴
(Cal/g/)	0.28 0.33	0.3 0.6
(Kcal/m · h ·)	0.15 0.20	0.20 0.45
(KV/mm)	20 38	10 20
(kg f/cm)	100	60

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(HRL)	가	,	D 70 80
(SRL)	.	Sludge	JIS A 50 65

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KS B 7501 1987	32 200mm	GC150	BC6 GC 150 STS 304 SSC 13	SM 30C ST S403	: BC6,BsC2,GC150
KS B 7505 1980	40 150mm :2 10	GC150	BC6 GC 150 ()	SM 30C ST S403	: BC6,BsC2,GC150 : BC6, GC150 : BC6,GC150 : BC6, BsC2, GC200
KS B 6318 1987	200 500mm	GC150	BC2 GC150	SM 30C ST S403	: BC6, STS403,S SC1 GC200
KS B 6319 1985	(NASH)	GC150 SSC 14	BC3 GC150 SSC14	SM 30C ST S403- ST S316	: BC3,SSC1,ST S316 , ,

	20 150mm				: BC6, GC200, SSC14
KS B 6321 1987	, 40 100mm	GC150 BC6 BsC2 GC150 SS400 SPP SPPS	STS410 SM 30C	BC6 PBrC2A GC150	: BC6,Bs C2,GC150 ST S410B : : ST S403CP SS400 GC150

3.2

()		-	Ductile	-			
()		-		-			
		-					

					-			
			-		-			

) (1) () 80m

: , : Ductile ,
(2) ,

(3) (2,200m)

(4) .

(5) .

3.3

		A	GC250	13Cr	13Cr	13Cr	13Cr		-
					13Cr		13Cr		

		B	GC 250	18Cr- 8Ni	13Cr	18Cr- 8Ni	18Cr- 8Ni		-
							18Cr- 8Ni		
		A	GC 250	13Cr	13Cr	13Cr	13Cr		18Cr- 8Ni
	(	B	GC 250	18Cr- 8Ni	13Cr	18Cr- 8Ni	18Cr- 8Ni		18Cr- 8Ni
							13Cr- 8Ni		
		A			13Cr	-	-	-	-
	150mm	B		13Cr	13Cr	-	-	-	-
	)			18Cr- 8Ni					

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				GC 200	BC 3.6	SM 35C	-	STS 304
				GC 200	Cr (Cr 20%)	SM 35C ()	Cr (Cr 20%)	STS 420J1 가 STS 304
				GC 200	Cr (Cr 20%)	SM 35C () STS 304	Cr (Cr 20%)	STS 420J1 가 STS 304
		가		GC 200	BC 6	SM 35C	-	BC 6
	가	가		PVC	PVC	STS 304	-	-
				GC 200	Cr (Cr 20%)	SM 35C SM 45C ()	Cr (Cr 20%)	STS 420J1 가 STS 304
		1, 2						
			GC 200	BC 3 6	SM 35C	-	STS 304	GC 200 SS 41
				GC 200	BC 3 6	SM 35C	-	STS 304
								Ejector : Maker : SPP
				GC 200	Cr	SM 35C SM 45C (STS 304 STS 304	Cr	-
				GC 200	GC 200	STS 304	-	-
				GC 200	GC 200	SM 35C		
				GC 200		SM 35C	-	STS 304
가								
	가			Cr (Cr 20%)	Cr (Cr 20%)	SM 35C SM 45C ()	Cr (Cr 20%)	STS 420J1 가 STS 304

				G C 2 0 0	B C 3 6	S M 3 5 C	-	-	G C 2 0 0 S S 4 0 0
				-	C r (C r 2 0 %)	S 3 5 C S 4 5 C ()	C r (C r 2 0 %)	: S T S 4 2 0 J 1 가 : S T S 3 0 4	-
				G C 2 0 0	G C 2 0 0	S M 3 5 C	-	S T S 3 0 4	
		가		P V C	P V C	S T S 3 0 4	-	-	G C 2 0 0 S S 4 0 0
				C r G C +	C r G C +	S T S 3 0 4 S M 3 5 C + S T S 3 0 4	-	-	-
				M a k e r					

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가

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Erosion, Corrosion ,

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1	GC200,250 Coating,	BC2,3,6		BC2,3,6		GC200,250 Coating,
2	2%NiGC(Ni) NiCrGC(NiCr)	SSC13,14 16, 11	STS 304 STS 316 STS 316L STS329J1	SSC13,14,16	STS 304 STS 316 STS 316L STS329J1	2%NiGC(Ni) NiCrGC(NiCr)
3	Resist Type D2,D2B					Resist Type D2,D2B
4	SSC 13,14,16					STS 316L ()
5	BC 2,3,6	BC2,3,6		BC2,3,6	BC2,3,6	BC2,3,6
6	A l BC2,3	A l BC2,3	, K , ()	A l BC2,3 ,K		A l BC2,3
7	SSC 23 (Carpenter20)	SSC 23	ASTM- B427 (20)	SSC 23	ASTM- B427	SSC 23 ASTM- B463 (Carpenter20)

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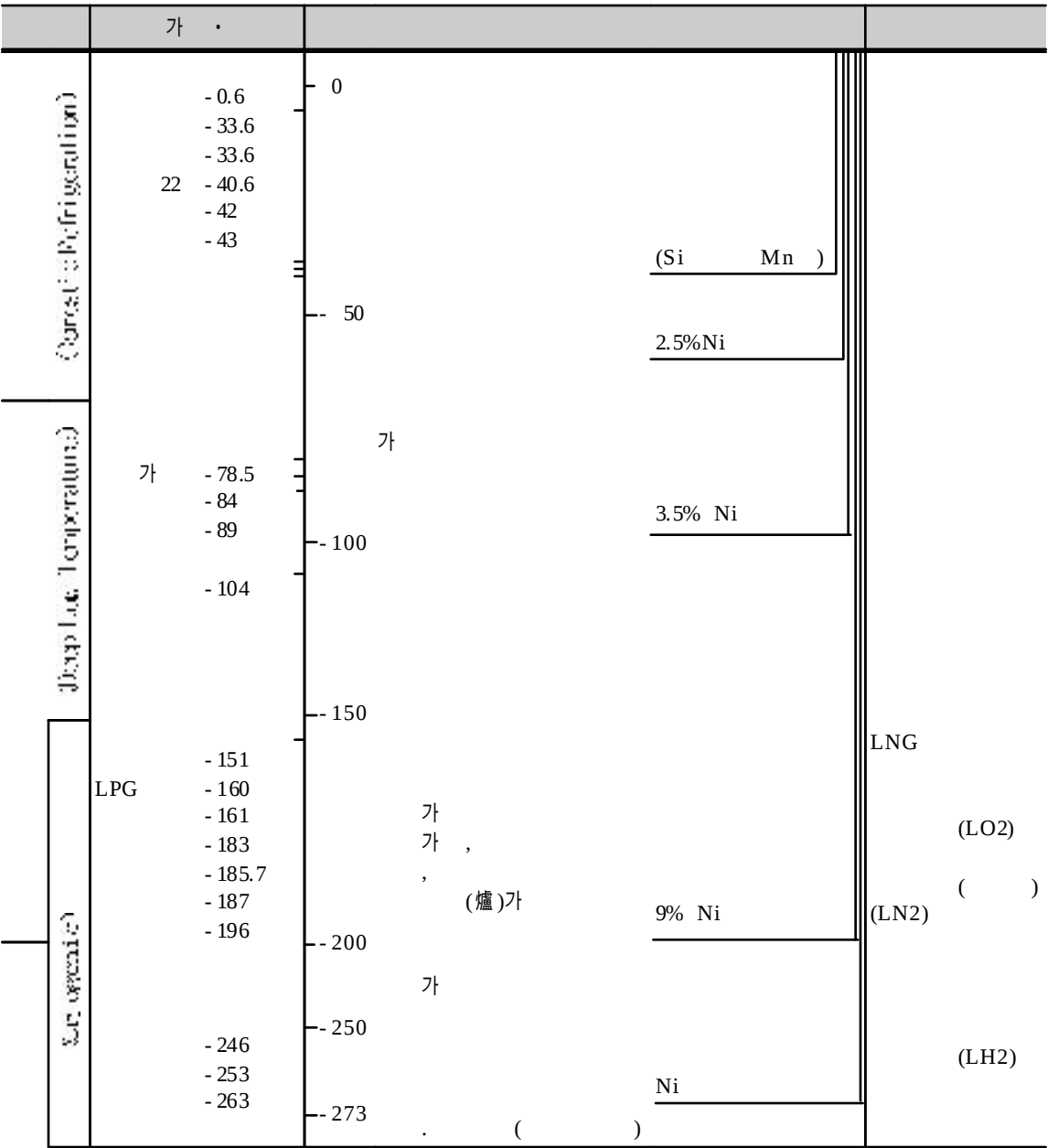
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3,4,6,7 : , Plant ,

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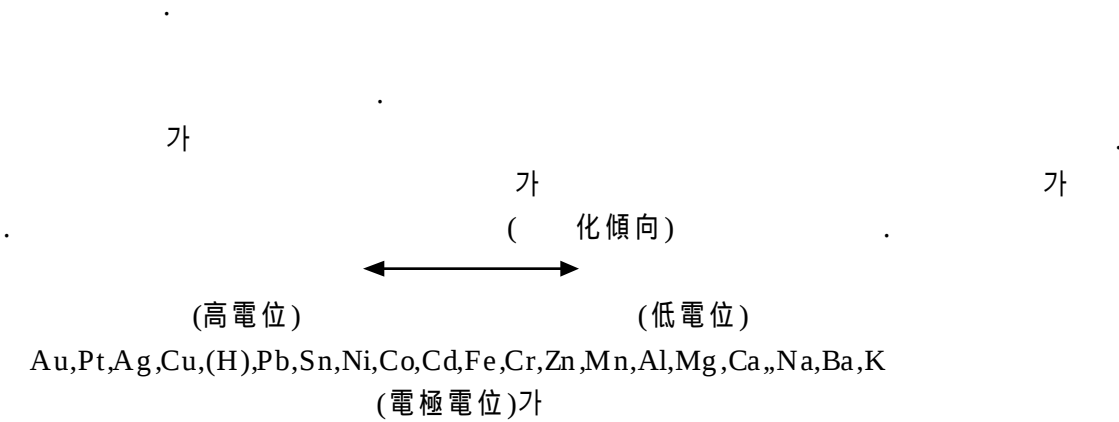
Standards API 610 (American Petroleum Institute, Centrifugal Pumps General Refinery Services) HI(American Hydraulic Institute)

Al, Ni, Ni 가 가 가

4.

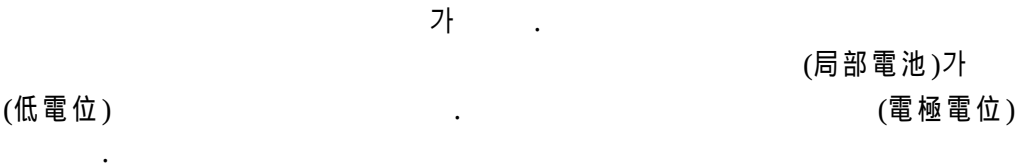
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1)



(酸)

2)



金屬 固有電位	
白金	+0.33V
金	+0.18
(18Cr- 8Ni- 3Mo)	- 0.04
銀	- 0.06
(18Cr- 8Ni)	- 0.08
(67Ni- 30Cu)	- 0.10
青銅	- 0.14
黃銅 (85015)	- 0.15
銅	- 0.17
(標準水素電極)	- 0.24
	- 0.24
黃銅 (60Cu- 30Zn)	- 0.27
失錫	- 0.46
鉛	- 0.50
銅, 鐵	- 0.45 0.65
	- 0.61
	- 0.78
亞鉛	- 0.07
	- 1.60

海水中, 飽和甘永基準

가 , ,
가 가 . 가
(性狀) , 가
.

5)

.
.
a) , , , pH
PH:14 7 3
← → ← →
b)
가 . pH .

c)

3.1 가

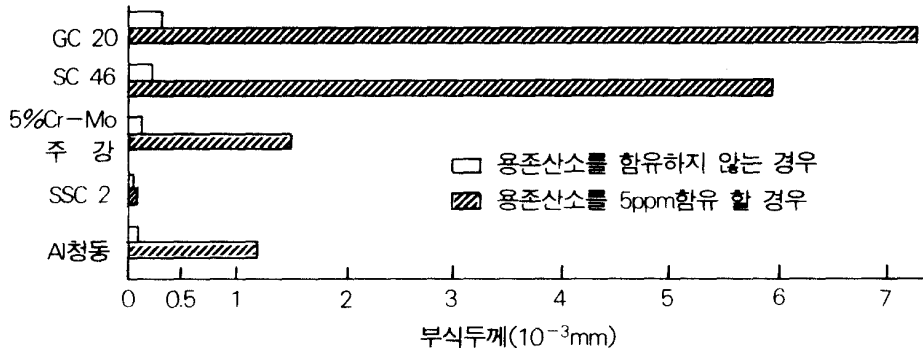


그림 3.1 3% 식염수, 유속 30m/sec에서의 용존산소의 영향

d)

3.2

e)

f)

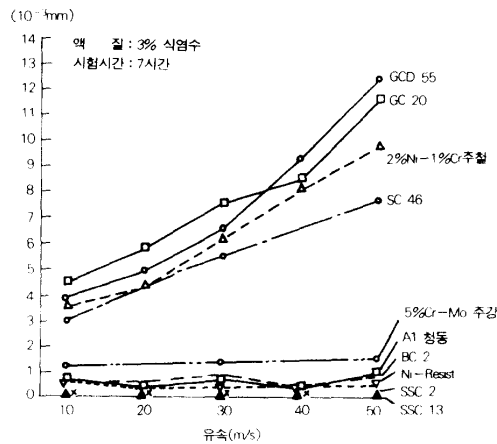


그림 3.2 각종 재료의 부식 두께와 유속과의 관계

g)

h) 가 , , .

4.2

(Uniform attack)		
(Pitting corrosion)	(1) PH 3 (2) Cl, Br (3) 가 .	Mo, Cu 가 C STS 316, 316L, 317, 317L (1) Mo, Si 가 (2) (3)
(Intergranular corrosion)	18-8 가 . 500 700 Cr Cr	(1) (2) (: STS 304L, 347, SSC 21,22) (3) C Cr (Ti,NB,Ta) 가(: STS 321, 347, SSC 21, 22) (4) (二相)
(Stress corrosion cracking)	, , , Al , Mg 가 .	(1) (2)
(Corrison fatigue cracking)	가	(1) (二相) (STS 329J1, SSC13) (2) (3)
(Oxygen concentration cell)	가	(1) (2)
(Salt concentration cell)	가	(3) 가

		(1)
		(2)
		(3)가
(C a v i t a t i o n e r o s i o n)	가	가

(
.)

1	(CoW)		1	(CoW)	
2			2		
3	(Al 10%)	18Cr- 8Ni ,13Cr	3	(Al 10%)	18Cr-8Ni ,13Cr
4		NiCrMo	4		NiCrMo
5		NiCr	5		NiCr
6		Mn	6		Mn
7		MnCr	7		MnCr
8	CuNi(N60%)	Cr	8	CuNi(N60%)	Cr
9	(CuSn)	Ni	9	(CuSn)	Ni
10			10		
11	(CuSnZn)		11	(CuSnZn)	,
12			12		
13	(6- 4 Brass)		13	(6- 4 Brass)	
14			14		
15	Cu- Ni(Ni30%)		15	Cu- Ni, (7- 3Brass)	
16	(7- 3 Brass)		16		
17			17		
18			18		
19			19		
20			20		

4.3

가

.

가 , 가
가 .

1)

2)

- .
- , , .
- .
- .
- .
- .

3)

4)

, ,

5)

- (,)
- ,
- (化成) , (化成) ,

6)

-
- (,)

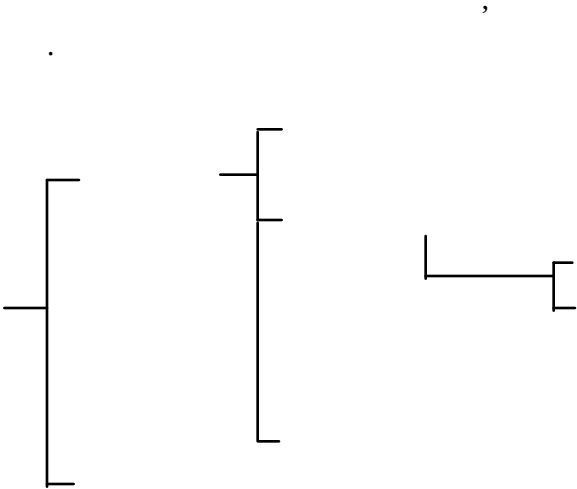
7)

, PH ,

8)

9)

4.4



1)

· ,
· 99.99%
·

2)

가 ·
·
가 ·

	()	()
	0.2- 0.7V	60V
	Mg .	가 .
		.
	(0)	.

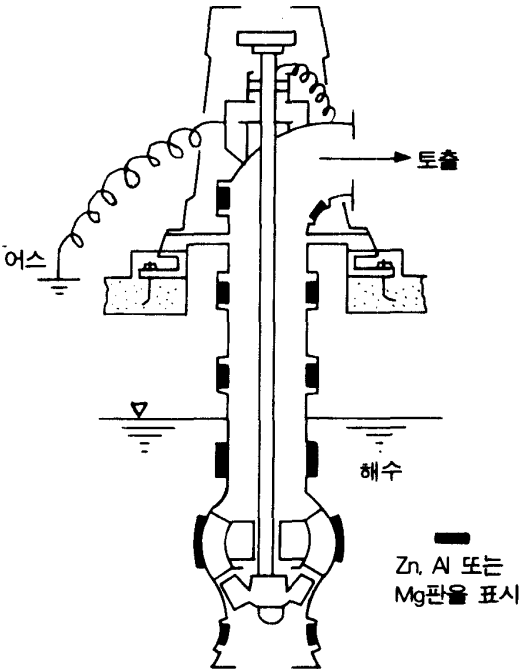
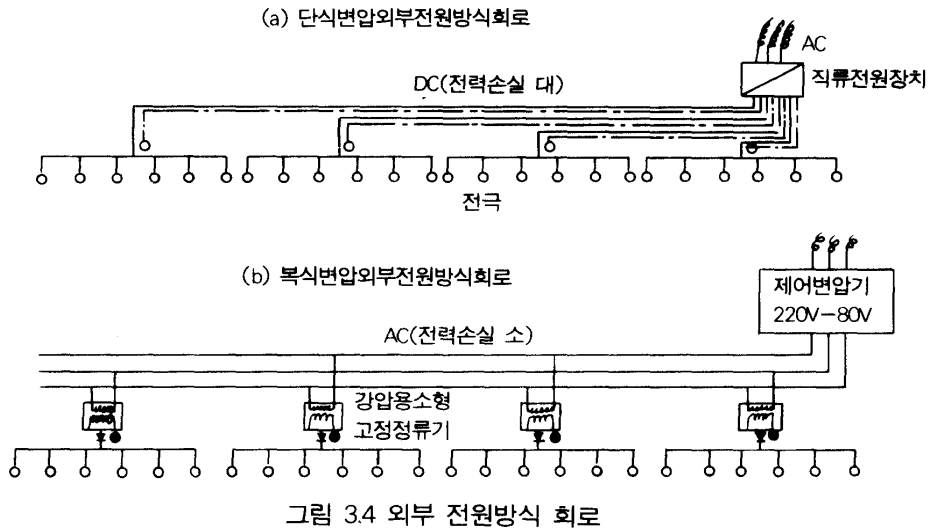


그림 3.3 유전양극 방식



5.

가

Plant

5.1

- 1) Plant :
- 2) :
- 3) :
- 4) (,):

5.2

- 1) :

- 2) :
- 3) : , ,
- 4) : %, %
- 5) , , , , , :
- 6) , :
- 7)

5.3

,

5.4 ()

Hr

5.5

- 1) (,) :
- 2) :
 ,
 :
- 3) () :
- 4) () :
 Kg f/cm^2 abs, mm Hg
- 5) () :
 cP, cSt
- 6) :
- 7) :
- 8) () :

5.6

- 1) (, ,) :

