For carbon steel

COVERED ARC WELDING ELECTRODES

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)				
						C	Si	Mn	P	S
Ilmenite type	KI-101LF	2.6~6.0	AWS E6019 JIS D4301 KS E4301	F, V, OH, H	AC/DC(±)	0.09	0.12	0.48	0.014	0.010
Lime titania type	KT-303	2.6~6.0	JIS D4303 KS E4303	F, V, OH, H	AC/DC(±)	0.07	0.15	0.37	0.014	0.013
High cellulose type	KCL-10	2.6~5.0	AWS E6010 JIS D4311 KS E4311	F, V, OH, H	DC(+)	0.10	0.20	0.47	0.014	0.012
	KCL-11	2.6~5.0	AWS E6011 JIS D4311 KS E4311	F, V, OH, H	AC/DC(+)	0.08	0.37	0.66	0.015	0.013
High titania type	K-6012	2.6~6.0	AWS E6012 JIS D4313 KS E4313	F, V, OH, H	AC/DC(−)	0.09	0.26	0.46	0.015	0.012
	KR-3000	2.6~6.0	AWS E6013 JIS D4313 KS E4313	F, V, OH, H	AC/DC(±)	0.07	0.32	0.45	0.015	0.012
	KR-3000V	2.6~5.0	AWS E6013 JIS D4313 KS E4313	VD, F	AC/DC(±)	0.08	0.26	0.45	0.012	0.010
Low hydrogen type	KH-500LF	2.6~6.0	AWS E7016 JIS D4316 KS E4316	F, V, OH, H	AC/DC(+)	0.07	0.46	0.97	0.012	0.009
	KH-500VLF	2.6~5.5	AWS E7048 JIS D4316 KS E4316	VD, F	AC/DC(+)	0.08	0.48	0.90	0.013	0.010
	KH-500W	2.6~5.0	AWS E7016 JIS D4316 KS E4316	F	AC/DC(+)	0.07	0.58	0.62	0.013	0.010
	KH-500T	3.2~5.0	AWS E7016 JIS D4316 KS E4316	F, V, VD, OH, H	AC/DC(+)	0.11	0.30	1.43	0.014	0.010
High iron oxide type	K-6022	2.6~6.0	AWS E6022	F, H-Fil	AC/DC(±)	0.13	0.09	0.86	0.017	0.011
High iron oxide, iron powder type	KF-300LF	4.0~6.4	AWS E6027 JIS D4327 KS E4327	F, H-Fil	AC/DC(±)	0.08	0.35	0.86	0.016	0.010
Special purpose	CUTTING ROD	3.2~5.0	–	–	AC/DC(−)	–	–	–	–	–
	GOUGING ROD	3.2~5.0	–	–	AC/DC(−)	–	–	–	–	–

Typical mechanical properties of all-weld-metal				Application	Approvals
Y.P N/mm² [kgf/mm²]	T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
400 {41}	460 {47}	34	120 {12} (0℃)	Welding of ship hulls, high pressure vessels, bridges, heavy duty structures and general structural fabrication.	ABS, BV, DNV, GL, KR, LR, NK, JIS, KS
420 {43}	460 {47}	32	120 {12} (0℃)	Welding of vehicles, ship hulls, bridges, agricultural machinery and light structural steels.	ABS, DNV, GL, KR, LR, NK, JIS, KS
420 {43}	500 {51}	24	50 {5} (-29℃)	Welding of pipeline and storage tank construction. Suitable for root pass and multi-layers in pipeline applications.	ABS, BV, CWB, NK, LR, JIS
410 {42}	500 {51}	24	50 {5} (-29℃)	Welding of storage tanks, pipes and pressure vessel fittings.	ABS, DNV, LR, CWB, JIS
420 {43}	480 {49}	26	90 {9} (0℃)	Welding of shells of railway vehicles, cars and other steel sheet structures and general light structural steels.	
430 {44}	480 {49}	29	70 {7} (0℃)	Welding of steel sheet structures, light structural steel, automobile bodies and machinery guards.	ABS, BV, DNV, GL, KR, LR, NK, CWB, JIS, KS
430 {44}	480 {49}	28	50 {5} (0℃)	Vertical-down welding of steel sheet structures, light structural steels, railway vehicles and cars.	ABS, BV, LR, JIS, KS
460 {47}	540 {55}	34	140 {14} (-29℃)	Welding of strength members of ship hulls, general heavy structural steels, free cutting steels and medium carbon steels.	ABS, BV, DNV, GL, KR, LR, NK, JIS, KS
440 {45}	550 {56}	33	90 {9} (-29℃)	Vertical-down welding of strength members of ship hulls, general heavy structural steels and pressure vessels.	ABS, BV, DNV, KR, LR, NK, JIS, KS
460 {47}	560 {57}	32	80 {8} (-29℃)	One-side welding of pipes, pressure vessels as well as butt joints in general.	ABS, DNV, JIS , KS
450 {46}	550 {56}	29	70 {7} (-29℃)	Tack welding of mild steel and 490N/mm² class high tensile steel.	ABS, LR, NK, JIS, KS
410 {42}	480 {49}	26	–	For single pass of groove welds in the flat welding position and fillet welds on sheet metal	
410 {42}	470 {48}	32	50 {5} (-29℃)	Flat and horizontal fillet welding of ship hulls, bridges, structural steel for buildings and general structures.	ABS, BV, DNV, GL, KR, LR, NK, JIS, KS
–	–	–	–	For cutting and piercing all metal,removing rivets and bolts.	
–	–	–	–	For gouging, bevelling out of excess metal in ferrous and nonferrous materials.	

For high tensile strength steel

COVERED ARC WELDING ELECTRODES

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)					
						C	Si	Mn	Cr	Ni	Mo
Iron powder, titania type	K-7014	2.6~6.0	AWS E7014	F, V, OH, H	AC/DC(±)	0.08	0.35	0.60	–	–	–
	K-7024	3.2~6.0	AWS E7024 JIS D4324 KS E4324	F, H-Fil	AC/DC(±)	0.09	0.35	0.78	–	–	–
High cellulose type	K-7010G	2.6~5.0	AWS E7010-G	F, V, OH	DC(+)	0.10	0.56	0.87	–	0.36	0.30
	K-8010G	2.6~5.0	AWS E8010-G	F, V, OH	DC(+)	0.10	0.60	0.93	–	0.42	0.35
Low hydrogen type	KK-50LF	2.6~6.0	AWS E7016 JIS D5016 KS D5016	F, V, OH, H	AC/DC(+)	0.08	0.57	1.02	–	–	–
	KK-50B	2.6~6.0	AWS E7016-G JIS D5016 KS D5016	F, V, OH, H	AC/DC(+)	0.07	0.78	1.05	–	–	0.15
	KK-55	2.6~6.0	AWS E8016-G JIS D5316 KS D5316	F, V, OH, H	AC/DC(+)	0.08	0.50	1.20	–	–	–
	KK-60	2.6~6.0	AWS E9016-G JIS D5816 KS D5816	F, V, OH, H	AC/DC(+)	0.07	0.58	1.04	–	0.64	0.26
	KK-70	2.6~6.0	AWS E10016-G JIS D7016 KS D7016	F, V, OH, H	AC/DC(+)	0.08	0.37	1.05	–	1.87	0.40
	KK-80	2.6~6.0	AWS E11016-G JIS D8016 KS D8016	F, V, OH, H	AC/DC(+)	0.07	0.60	1.10	0.15	1.84	0.43
Low hydrogen, iron powder type	K-7018	2.6~6.0	AWS E7018 JIS D5016 KS D5016	F, V, OH, H	AC/DC(+)	0.07	0.57	0.97	–	–	–
	K-7028LF	4.5~6.4	AWS E7028 JIS D5026 KS D5026	F, H-Fil	AC/DC(+)	0.07	0.52	0.98	–	–	–
	K-8018	2.6~6.0	AWS E8018-G JIS D5316 KS D5316	F, V, OH, H	AC/DC(+)	0.06	0.54	1.08	–	0.31	0.20
	K-9018M	2.6~6.0	AWS E9018-M JIS D5816 KS D5816	F, V, OH, H	AC/DC(+)	0.07	0.51	1.10	0.10	1.58	0.20
	K-10018M	2.6~6.0	AWS E10018-M JIS D7016 KS D7016	F, V, OH, H	AC/DC(+)	0.07	0.46	1.35	0.14	1.63	0.28
	K-11018M	2.6~6.0	AWS E11018-M JIS D8016 KS D8016	F, V, OH, H	AC/DC(+)	0.08	0.41	1.49	0.32	1.86	0.32
	K-12018M	2.6~6.0	AWS E12018-M	F, V, OH, H	AC/DC(+)	0.08	0.30	1.46	0.98	1.86	0.41

Typical mechanical properties of all-weld-metal				Application	Approvals
Y.P N/mm² [kgf/mm²]	T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
470 {48}	550 {56}	30	80 {8} (-29℃)	Welding of ship structures, bridges, sheet metal and structural steel for buildings.	ABS, CWB, KR, LR, NK
480 {49}	570 {58}	28	70 {7} (0℃)	Flat and horizontal fillet welding of ship structures, bridges and general structural steels.	ABS, BV, CWB, DNV, GL, KR, LR, NK, JIS
470 {48}	570 {58}	27	40 {4} (-29℃)	Welding of Pressure pipes, general light structural steels, agricultural machinery etc.	
520 {53}	610 {62}	24	45 {5} (-29℃)	Welding of 540N/mm² class high tensile strength steel for butt welding fo pipes.	
480 {49}	560 {57}	32	140 {14} (-29℃)	Welding of 490N/mm² class high strength steel of ships, buildings and pressure vessels.	
530 {54}	630 {64}	30	90 {9} (-29℃)	Welding of steel which is subjected to elevated temperature such as those found in the high pressure pipe and boiler industries.	
540 {55}	600 {61}	28	130 {13} (-29℃)	Welding of 540N/mm² class high strength steel of ships, bridges and buildings.	
550 {56}	650 {66}	29	140 {14} (-29℃)	Welding of 590N/mm² class high strength steel of pressure vessels, bridges, penstocks, vehicles and machinery.	
640 {65}	730 {74}	26	120 {12} (-29℃)	Welding of 690N/mm² class high strength steel of pressure vessels, bridges and penstocks.	
730 {74}	830 {85}	22	120 {12} (-29℃)	Welding of 790N/mm² class high strength steel of pressure vessels, bridges and penstocks.	
480 {49}	570 {58}	30	90 {9} (-29℃)	Welding of 490N/mm² class high strength steel of ships, buildings and pressure vessels.	ABS, BV, CWB, DNV, GL, KR, LR, NK, JIS, KS
470 {48}	550 {56}	31	130 {13} (-18℃)	High deposition efficiency welding of flat and horizontal fillets, as well as deep groove joint in 490N/mm² high strength steel.	ABS, BV, DNV, GL, KR, LR, NK, JIS
490 {50}	590 {60}	28	150 {15} (-29℃)	Welding of 540N/mm² class high strength steel of ships, bridges, storage tanks and buildings.	ABS, JIS
570 {58}	670 {68}	30	90 {9} (-51℃)	Welding of high strength low alloy steel having tensile strength of about 590N/mm²	
640 {65}	750 {77}	29	70 {7} (-51℃)	Welding of high strength low alloy steel having tensile strength of about 690N/mm²	
720 {73}	820 {84}	23	60 {6} (-51℃)	Welding of high strength low alloy steel having tensile strength of about 790N/mm² such as HY 80 etc.	
810 {83}	950 {97}	20	50 {5} (-51℃)	Welding of high strength low alloy steel having tensile strength of about 890N/mm²	

For atmospheric corrosion resisting steel

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)					
						C	Si	Mn	Cr	Ni	Cu
Low hydrogen type	KW-50G	3.2~6.0	AWS E7016-G JIS DA5016W KS DA5016W	F, V, OH, H	AC/DC(+)	0.06	0.46	0.74	0.52	0.63	0.40
	KW-50V	2.6~5.0	AWS E7016-G JIS DA5016G KS DA5016G	VD	AC/DC(+)	0.06	0.54	0.86	–	0.60	0.27
	KW-60G	3.2~6.0	AWS E8016-G JIS DA5816W KS DA5816W	F, V, OH, H	AC/DC(+)	0.07	0.65	0.90	0.55	0.30	0.36
Low hydrogen, iron powder type	KW-50WH	4.0~6.0	JIS DA5026W KS DA5026W	F, H-Fil	AC/DC(+)	0.07	0.30	0.92	0.54	0.53	0.39

Typical mechanical properties of all-weld-metal				Application	Approvals
Y.P N/mm² [kgf/mm²]	T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
510 {51}	570 {58}	28	160 {16} (0℃)	Welding of 490N/mm² class weathering steel of vehicles, buildings and bridges.	
440 {45}	540 {55}	32	170 {17} (0℃)	Vertical-down welding of 490N/mm² class weathering steel of vehicles, buildings and bridges.	
530 {54}	620 {63}	24	90 {9} (-5℃)	Welding of 590N/mm² class weathering steel of vehicles, buildings, bridges and steel structures.	
510 {52}	560 {57}	26	70 {7} (0℃)	Flat and horizontal fillet welding of 490N/mm² class weathering steels.	

For low temperature service steel

COVERED ARC WELDING ELECTRODES

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)			
						C	Si	Mn	Ni
Low hydrogen type	KK-50N	2.6~6.0	AWS E7016-G JIS DL5016-4A0 KS DL5016-4A0	F, V, OH, H	AC/DC(+)	0.08	0.42	1.35	0.47
	KK-50NN	2.6~6.0	AWS E7016-G JIS DL5016-6A1 KS DL5016-6A1	F, V, OH, H	AC/DC(+)	0.07	0.37	1.45	1.37
	K-8016C1	2.6~6.0	AWS E8016-C1 JIS DL5016-6P2 KS DL5016-6P2	F, V, OH, H	AC/DC(+)	0.07	0.45	0.98	2.25
	K-8016C2	2.6~6.0	AWS E8016-C2 JIS DL5016-6P3 KS DL5016-6P3	F, V, OH, H	AC/DC(+)	0.07	0.45	1.10	3.46
Low hydrogen , iron powder type.	K-7018N	2.6~6.0	AWS E7018-1	F, V, OH, H	AC/DC(+)	0.07	0.58	1.38	0.15
	K-8018C1	2.6~6.0	AWS E8018-C1	F, V, OH, H	AC/DC(+)	0.06	0.60	0.98	2.41
	K-8018C2	2.6~6.0	AWS E8018-C2	F, V, OH, H	AC/DC(+)	0.07	0.32	1.12	3.45
	K-8018C3	2.6~5.0	AWS E8018-C3	F, V, OH, H	AC/DC(+)	0.07	0.45	0.91	1.03

Typical mechanical properties of all-weld-metal				Application	Approvals
Y.P N/mm² [kgf/mm²]	T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
490 {50}	570 {58}	30	130 [13] (-45℃)	Welding of aluminium-killed steel used at low temperature. LPG tankers and LPG storage tanks, etc.	DNV, LR
520 {53}	590 {60}	30	130 [13] (-60℃)	Welding of aluminium-killed steel used at low temperature. LPG tankers, etc.	
520 {53}	600 {61} PWHT : 610℃×1hr. S·R	30	130 [13] (-60℃)	Welding of 2.5%Ni steel used at low temperature.	
500 {51}	610 {62} PWHT : 610℃×1hr. S·R	30	70 [7] (-73℃)	Welding of 3.5%Ni steel used at low temperature.	
510 {52}	590 {60}	32	130 [13] (-46℃)	Welding of aluminium-killed steel used at low temperature. LPG tankers and LPG storage tanks, etc.	DNV, LR, CWB
500 {51}	600 {61} PWHT : 610℃×1hr. S·R	32	130 [13] (-60℃)	Welding of 2.5%Ni steel used at low temperature.	ABS, DNV, LR
570 {58}	650 {66} PWHT : 610℃×1hr. S·R	22	80 [8] (-73℃)	Welding of 3.5%Ni steel used at low temperature.	
530 {54}	600 {61}	31	60 [6] (-40℃)	Welding of high strength steel used at low temperature and 1%Ni steel.	ABS, LR

For heat-resisting steel

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)				
						C	Si	Mn	Cr	Mo
High cellulose type	K-7010A1	2.6~5.0	AWS E7010-A1	F, V, OH, H	DC(+)	0.09	0.14	0.43	–	0.49
Low hydrogen type	K-7016A1	2.6~6.0	AWS E7016-A1 JIS DT1216 KS DT1216	F, V, OH, H	AC/DC(+)	0.07	0.54	0.83	–	0.52
	K-8016B1	2.6~6.0	AWS E8016-B1	F, V, OH, H	AC/DC(+)	0.07	0.51	0.81	0.51	0.49
	K-8016B2	2.6~6.0	AWS E8016-B2 JIS DT2316 KS DT2316	F, V, OH, H	AC/DC(+)	0.06	0.47	0.65	1.31	0.52
	K-9016B3	2.6~6.0	AWS E9016-B3 JIS DT2416 KS DT2416	F, V, OH, H	AC/DC(+)	0.08	0.45	0.78	2.37	1.03
	K-502	2.6~6.0	AWS E502-16 JIS DT2516 KS DT2516	F, V, OH, H	AC/DC(+)	0.06	0.43	0.57	4.98	0.51
	K-502-15	2.6~5.0	AWS E502-15 JIS DT2516 KS DT2516	F, V, OH	DC(+)	0.08	0.35	0.84	5.25	0.55
	K-505	2.6~6.0	AWS E505-16 JIS DT2615 KS DT2615	F, V, OH, H	AC/DC(+)	0.08	0.74	0.98	8.48	0.90
	K-505-15	2.6~6.0	AWS E505-15 JIS DT2616 KS DT2616	F, V, OH	DC(+)	0.08	0.45	0.88	8.86	0.90
Low hydrogen , iron powder type.	K-7018A1	2.6~6.0	AWS E7018-A1	F, V, OH, H	AC/DC(+)	0.06	0.49	0.72	–	0.53
	K-8018B2	2.6~6.0	AWS E8018-B2 JIS DT2318 KS DT2318	F, V, OH, H	AC/DC(+)	0.06	0.61	0.70	1.32	0.55
	K-9018B3	2.6~6.0	AWS E9018-B3 JIS DT2418 KS DT2418	F, V, OH, H	AC/DC(+)	0.08	0.50	0.77	2.25	1.02

Typical mechanical properties of all-weld-metal				Application	Approvals
Y.P N/mm² [kgf/mm²]	T.S N/mm² [kgf/mm²]	El. (%)	PWHT		
440 {45}	550 {56}	29	620℃×1hr. S·R	Welding of 0.5%Mo steel and carbon steel used at high temperature such as high pressure boilers and drums.	ABS
560 {57}	650 {66}	31	620℃×1hr. S·R	Welding of equipments used at high temperature such as C-Mo steel pipes, and other high strength low alloy steels.	
590 {60}	670 {68}	26	690℃×1hr. S·R	Welding of 0.5%Cr-0.5%Mo steels used at high temperature and high pressure boilers, chemical plants and oil refining plants.	
570 {58}	650 {66}	26	690℃×1hr. S·R	Welding of 1.25%Cr-0.5%Mo steel used for thermoelectric power plant and equipments of oil refining industries.	
620 {63}	710 {72}	24	690℃×1hr. S·R	Welding of 2.25%Cr-1%Mo steel used for electric power plant and equipments of oil refining industries and chemical industries.	
420 {43}	540 {55}	33	850℃×2hr. S·R	Welding of 5%Cr-0.5%Mo steel to be used in oil refining industries and chemical industries.	
450 {45}	580 {59}	31	850℃×1hr. S·R	Welding of heat treated high tensile strength steel for aircraft parts, such as SAE 4130. Welding of 5%Cr-0.5%Mo steel used in oil refining and chemical industries.	
480 {49}	570 {58}	30	850℃×2hr. S·R	Welding of 9%Cr-1%Mo steel, heater of high temperature and high pressure boilers.	
470 {48}	540 {55}	33	850℃×2hr. S·R	Welding of super-heater tubes of high temperature and high pressure boilers, heater tubes of oil refining equipments.	
590 {60}	680 {69}	28	620℃×1hr. S·R	Welding of equipments used at high temperature such as C-Mo steel pipes, other high strength low alloy steels.	
590 {60}	670 {68}	25	690℃×1hr. S·R	Welding of 1.25%Cr-0.5%Mo steel used for steam pipes of boilers for electric power plant and equipments of oil refining industries.	ABS, DNV, LR
680 {69}	750 {77}	21	690℃×1hr. S·R	Welding of 2.25%Cr-1%Mo steel used for electric power plant, equipments of oil refining industries and chemical industries.	

※S·R: Stress Relief Heat Treatment

For stainless steel

COVERED ARC WELDING ELECTRODES

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)					
						C	Si	Mn	Cr	Ni	Mo
Low hydrogen type	KST-307-15	2.6~5.0	AWS E 307-15 JIS D307-15 KS D307-15	F, V, OH, H	DC(+)	0.06	0.78	4.68	18.5	9.3	0.6
	KST-309Mo-15	2.6~5.0	AWS E309Mo-15 JIS D309Mo-15 KS D309Mo-15	F, V, OH, H	DC(+)	0.06	0.35	1.84	22.2	12.4	2.4
Lime titania type	KST-308	2.6~5.0	AWS E 308-16 JIS D308-16 KS D308-16	F, V, OH, H	AC /DC(+)	0.05	0.78	1.22	19.3	9.6	–
	KST-308-15	2.6~5.0	AWS E 308-15 JIS D308-15 KS D308-15	F, V, OH	DC(+)	0.06	0.38	1.54	20.5	9.5	–
	KST-308L	2.0~5.0	AWS E 308L-16 JIS D308L-16 KS D308L-16	F, V, OH, H	AC /DC(+)	0.03	0.76	1.18	18.8	9.5	–
	KST-308L-15	2.0~5.0	AWS E 308L-15 JIS D308L-15 KS D308L-15	F, V, OH	AC /DC(+)	0.03	0.41	1.67	20.6	9.6	–
	KST-308Mo	2.6~5.0	AWS E308Mo-16 JIS D308Mo-16 KS D308Mo-16	F, V, OH	AC /DC(+)	0.05	0.40	1.40	19.80	9.40	2.10
	KST-309	2.0~5.0	AWS E 309-16 JIS D309-16 KS D309-16	F, V, OH, H	AC /DC(+)	0.06	0.72	1.36	23.6	12.6	–
	KST-309-15	2.6~5.0	AWS E 309-15 JIS D309-15 KS D309-15	F, V, OH	DC(+)	0.05	0.36	1.83	24.5	13.3	–
	KST-309L	2.0~5.0	AWS E 309L-16 JIS D309L-16 KS D309L-16	F, V, OH, H	AC /DC(+)	0.03	0.71	1.34	23.7	12.6	–
	KST-309L-15	2.6~5.0	AWS E 309L-15 JIS D309L-15 KS D309L-15	F, V, OH	DC(+)	0.03	0.40	1.92	24.3	13.2	–
	KST-309Mo	2.0~5.0	AWS E 309Mo-16 JIS D309Mo-16 KS D309Mo-16	F, V, OH, H	AC /DC(+)	0.06	0.78	1.47	23.2	12.4	2.3
	KST-309MoL	2.0~5.0	AWS E 309MoL-16 JIS D309MoL-16 KS D309MoL-16	F, V, OH, H	AC /DC(+)	0.03	0.76	1.78	23.2	13.1	2.4
	KST-310	2.0~5.0	AWS E 310-16 JIS D310-16 KS D310-16	F, V, OH, H	AC /DC(+)	0.11	0.40	1.86	25.6	20.8	–
	KST-312	2.6~5.0	AWS E 312-16 JIS D312-16 KS D312-16	F, V, OH, H	AC /DC(+)	0.08	0.45	1.30	29.1	8.5	–
	TENSILE WELD	2.6~5.0	–	F, V, OH	AC /DC(+)	0.08	0.95	1.48	28.9	8.6	–
	KST-316	2.6~5.0	AWS E 316-16 JIS D316-16 KS D316-16	F, V, OH, H	AC /DC(+)	0.06	0.73	1.18	18.3	12.5	2.3
	KST-316-15	2.6~5.0	AWS E 316-15 JIS D316-15 KS D316-15	F, V, OH	DC(+)	0.06	0.39	1.18	18.9	11.5	2.3
	KST-316L	2.0~5.0	AWS E 316L-16 JIS D316L-16 KS D316L-16	F, V, OH	AC /DC(+)	0.03	0.72	1.08	18.4	12.5	2.3
	KST-316L-15	2.6~5.0	AWS E 316L-15 JIS D316L-15 KS D316L-15	F, V, OH	DC(+)	0.03	0.40	1.21	19.2	11.4	2.3
	KST-317	2.0~5.0	AWS E 317-16 JIS D317-16 KS D317-16	F, V, OH, H	AC /DC(+)	0.06	0.74	1.20	18.5	12.3	3.2
	KST-317L	2.0~5.0	AWS E 317L-16 JIS D317L-16 KS D317L-16	F, V, OH, H	AC /DC(+)	0.03	0.75	1.24	18.6	12.4	3.3
	KST-318	2.6~5.0	AWS E 318-16 JIS D318-16 KS D318-16	F, V, OH, H	AC /DC(+)	0.05	0.76	1.32	18.5	11.9	2.3 Cb;0.66
	KST-347	2.0~5.0	AWS E 347-16 JIS D347-16 KS D347-16	F, V, OH, H	AC /DC(+)	0.06	0.42	1.98	19.9	9.5	Cb;0.56
	KST-347L	2.0~5.0	AWS E 347L-16 JIS D347L-16 KS D347L-16	F, V, OH, H	AC /DC(+)	0.03	0.46	0.68	19.4	9.8	Cb;0.68
	KST-410L	2.6~5.0	AWS E 410-16 JIS D410-16 KS D410-16	F, V, OH, H	AC /DC(+)	0.08	0.70	0.76	12.1	–	–
	KST-430	2.6~5.0	AWS E 430-16 JIS D430-16 KS D430-16	F, V, OH, H	AC /DC(+)	0.07	0.42	0.40	17.4	–	–

Typical mechanical properties of all-weld-metal		Application	Approvals
T . S N/mm² [kgf/mm²]	El. (%)		
650 {66}	48	Welding of dissimilar steel such as welding austenitic manganese steel to carbon steel forgings or castings.	
630 {64}	36	Welding of Type 316 clad steel or dissimilar steel. Corrosion resistant lining of carbon steel or low alloy steel.	
580 {59}	44	Welding of 18%Cr-8%Ni steel such as AISI Types 301,302,304,305 and 308.	ABS, BV, DNV, GL, KR, CWB
600 {61}	38	Welding of 18%Cr-8%Ni stainless steel AISI 301,302,304,308	
550 {56}	44	Welding of low carbon 18%Cr-8%Ni steel.	ABS, BV, GL, LR, CWB, TÜV
550 {56}	44	Welding of low carbon 18%Cr-8%Ni stainless steel. (AISI (SUS) 304L)	
610 {62}	38	But and Fillet wedling of ASTM CF8M stainless steel castings. Used for welding wrought materials such as Type 316L stainless when increased ferrite is desired.	
550 {56}	44	Welding of 22%Cr-12%Ni steel. Welding of dissimilar steel such as joining Type 304 to carbon steel, welding the clad side of Type 304 clad steel.	ABS, BV, DNV, GL, KR, LR, CWB
610 {62}	39	Welding of 22%Cr-12%Ni stainless steel and heat-resisting castings, clad side of Type 304 clad steels. Welding of dissimilar steels such as Cr-Mo steel or carbon steel to stainless steel.	
550 {56}	44	Welding of 22%Cr-12%Ni steel, carbon steel or low alloy steel to stainless steel and stainless clad steel.	ABS, CWB
590 {60}	38	Welding of 22%Cr-12%Ni steel and heat-resisting castings, clad stainless steel. Welding of dissimilar metal such as carbon steel to stainless steel.	
630 {64}	34	Welding of Type 316 clad steel or dissimilar steel. Corrosion resistant lining of carbon steels or low alloy steels.	DNV
590 {60}	41	Welding of Type 316 clad steel or dissimilar steel. Corrosion resistant lining of carbon steels or low alloy steels.	KR
590 {60}	40	Welding of 25%Cr-20%Ni steel and clad side of 18%Cr-8%Ni clad steel. Perfect austenitic microstructure.	CWB
770 {79}	24	Welding of 29%Cr-9%Ni type cast steel. Joint welding difficult-to-weld steel. For a wear resistant build-up and buffer layer for hardfacing.	
770 {79}	24	Welding of 29%Cr-9%Ni type cast steels and difficult-to-weld steels. joint welding and hardfacing of stainless steel and heat-resisting steels.	
570 {58}	41	Welding of 18%Cr-12%Ni-Mo steel(AISI Type316). Underlaying of the build-up welding of 13%Mn steel.	ABS, BV, GL, CWB
580 {59}	41	Welding of 18%Cr-12%Ni-Mo stainless steel AISI (SUS) 316. Welding of dissimilar steels.	
540 {55}	43	Welding of low carbon, molybdenum-bearing austenitic alloys. Welding of 18% Cr-12%Ni-2%Mo steel where the corrosion resistant qualities are required.	ABS, BV, DNV, GL, KR, LR, CWB, TÜV
590 {60}	39	Welding of low carbon 18%Cr-12%Ni -Mo stainless, steels austenitic stainless steels which are required and the place where heat treatment after welding is impossible.	
580 {59}	42	KST-317 has a greater molybdenum content than KST-316. The increased molybdenum content resulted in a weld deposit with higher tensile strength at elevated temperature, stronger resistance against pitting corrosion.	
560 {57}	44	Welding of AISI Types 317, 317L.	
630 {64}	38	KST-318 is similar to KST-316, but contains columbium to provide resistance to intergranular carbide precipitation.	
620 {63}	36	Welding of 18%Cr-8%Ni-Cb steel(AISI Type 347), 18%Cr-8%Ni-Ti steel(AISI Type321) and low carbon 18%Cr-8%Ni steel(AISI Type 304L)	
610 {62}	36	Welding of AISI Types 347, 321, 304L stainless steel and the place where solution treatment is impossible.	
560 {57}	24	Welding of 13%Cr steel. Surfacing of carbon steel to resist corrosion, erosion or abrasion.	
PWHT : 730℃×1hr. S·R			
530 {54}	27	Welding of 17%Cr stainless steel. Welding of clad side of stainless clad steel (AISI Types 403, 405) to resist corrosion, erosion.	
PWHT : 760℃×2hr. S·R			

※S·R: Stress Relief Heat Treatment

For hardfacing

COVERED ARC WELDING ELECTRODES

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)						Typical hardness of all-weld-metal (HV)	Application	Approvals
						C	Si	Mn	Cr	Mo	Other elements			
High titania type	KM-100	3.2~6.0	JIS DF2A-250-R KS DF2A-250-R	F, V, H	AC /DC(+)	0.11	0.42	0.98	–	–	–	230	For metal to metal wear. Hardfacing of gears and wheels.	
	KM-100C	3.2~6.0	JIS DF2A-350-R KS DF2A-350-R	F, V, H	AC /DC(+)	0.19	0.44	0.74	2.6	–	–	350	For metal to metal wear. Hardfacing of gears and shafts.	
	KM-300R	3.2~6.0	JIS DF2A-300-R KS DF2A-300-R	F, V, H	AC /DC(+)	0.20	0.40	0.46	2.7	–	–	310	For metal to metal wear. Hardfacing of shafts, rollers and similars.	
Low hydrogen type	KM-250	3.2~6.0	JIS DF2A-250-B KS DF2A-250-B	F, H	AC /DC(+)	0.11	0.52	1.72	–	–	–	350	For metal to metal wear. Hardfacing and repairing of worn parts such as shafts, gears and wheels, etc.	
	KM-300	3.2~6.0	JIS DF2A-300-B KS DF2A-300-B	F, H	AC /DC(+)	0.20	0.60	1.48	0.7	–	–	310	For metal to metal wear. Hardfacing of couplings, rails and gear parts, etc.	
	KM-350	3.2~6.0	JIS DF2B-350-B KS DF2B-350-B	F	AC /DC(+)	0.36	0.65	0.74	2.0	–	–	360	For metal to metal wear. Hardfacing of rollers, shafts and sprockets, etc.	
	KM-500	3.2~6.0	JIS DF2B-450-B KS DF2B-450-B	F	AC /DC(+)	0.38	0.84	1.56	2.5	–	–	450	Hardfacing of rollers, sprockets, screw conveyors and bulldozer blades, etc.	
	KM-700	3.2~6.0	JIS DF2B-700-B KS DF2B-700-B	F	AC /DC(+)	0.48	0.80	1.45	4.4	–	–	690	For scratching abrasion. Hardfacing of mixers, cutter knives and dredgers, etc.	
	KM-800	3.2~6.0	JIS DF3C-700-B KS DF3C-700-B	F	AC /DC(+)	0.68	0.50	1.23	5.7	–	–	720	For scratching abrasion. Hardfacing of pump casings, impellers and buckets, etc.	
	KM-900	3.2~6.0	JIS DFMA-250-B KS DFMA-250-B	F	AC /DC(+)	0.52	0.30	12.1	–	–	–	230	For impact and abrasion resistance. Hardfacing of crushers,high manganese steel rails, bucket lip and shovel teeth.	
	KM-11Cr	3.2~5.0	JIS DF4B-500-B KS DF4B-500-B	F	AC /DC(+)	0.40	1.28	0.46	11.2	1.4	–	540	For wear and corrosion resistance at elevated temperature. Hardfacing of cutting tools, shearing blades and similars.	
	KBH-2	3.2~5.0	–	F	AC /DC(+)	0.29	0.15	1.25	16.4	4.5	Ni, W	250	For impact and wear resistance at elevated temperature. Hardfacing of cutting tools, forming dies and shearing dies, etc.	
	KOSPEL-600H	2.6~5.0	–	F	AC /DC(+)	0.25	0.59	0.95	2.5	–	W, V	550	Hardfacing of metal mould, thermal cutting off machine, forging mould, dotting punch, compression tap, impact tap and axis of rotation.	
Lime titania type	KM-13CrM	4.0~6.0	–	F	AC /DC(+)	0.30	0.48	12.4	11.8	1.5	W	310	For wear resistance at elevated temperature. Hardfacing of ingot tongs, broaches and similars.	
	KQD-600	2.6~4.0	–	F	AC /DC(+)	0.42	0.57	0.40	9.7	1.3	W	600	Hardfacing of press moulds, forged metal moulds, tool steel and hardened parts by quenching.	
	KSB-2	3.2~5.0	JIS DF3B-600-BR KS DF3B-600-BR	F	AC /DC(+)	0.50	0.09	0.52	6.1	1.8	V	570	Hardfacing of clutch, cams, forming dies and forged metal moulds.	
	KOSPEL-800R	2.6~5.0	–	F	AC /DC(+)	0.38	0.42	0.32	5.5	2.5	V	350	Hardfacing of conveyor screw, caterpillar, crusher and dredger teeth.	
Special type	KM-1000	3.2~4.0	JIS DFWA-700-S KS DFWA-700-S	F	AC /DC(+)	2.98	0.60	1.88	–	–	W	820	For severe abrasion. Hardfacing of cutter knives, shovel teeth, cement mixers and fans, etc.	

For cast iron

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)					Typical mechanical properties of all-weld-metal			Application	Approvals
						C	Si	Mn	Fe	Ni	T.S N/mm² [kgf/mm²]	El. (%)	Hardness (HV)		
Graphite type	KL-100	3.2~5.0	JIS DFCCI KS DFCCI	F	AC /DC(+)	3.16	6.27	0.42	Rem.	–	–	–	280	Repairing of ingot cases.	
	KCF-50	2.6~5.0	AWS (ESt)	F	AC /DC(+)	1.68	0.50	0.35	Rem.	–	490 {50}	33	200	Repairing of various kinds of cast iron products.	
	KFN-50	2.6~5.0	AWS ENiFe-CI JIS DFCNiFe KS DFCNiFe	F	AC /DC(+)	0.80	0.36	1.45	Rem.	55.5	550 {56}	–	190	Welding of various types of cast irons. Welding of cast irons to steel and other ferrous and nonferrous materials.	
	KSN-100	2.6~5.0	AWS ENi-CI JIS DFCNi KS DFCNi	F	AC /DC(+)	0.55	0.40	0.35	0.85	Rem.	420 {43}	–	180	Welding of cast irons to themselves or dissimilar metals such as low alloy and carbon steel.	

For nickel and nickel alloys

Type of covering	Brand name	Size (mm)	Equivalent specification	Welding position	Type of current	Typical chemical composition of all-weld-metal (%)							Typical mechanical properties of all-weld-metal		Application	Approvals
						C	Si	Mn	Fe	Ni	Cr	Cb+Ta	T.S N/mm² [kgf/mm²]	El. (%)		
Low hydrogen type	KNCF-3	2.6~5.0	AWS ENiCrFe-3 JIS DNiCrFe-3 KS DNiCrFe-3	F, V, OH, H	DC(+)	0.06	0.42	7.95	3.9	69.1	16.2	1.9	700 {71}	35	Welding of Ni-Cr-Fe alloys (Inconel 600) or clad side of joints in steel clad with Ni-Cr-Fe alloy. Surfacing steel with Ni-Cr-Fe weld metal, when comparatively high Mn contents are not determinant.	
	KW-A690	2.6~5.0	AWS ENiCrFe-7	F, V,OH	AC /DC(+)	0.05	0.52	1.45	10.1	Rem.	29.5	1.2	670 {68}	44	Welding of Ni-Cr-Fe alloy steel (Inconel 690) Welding of different materials, such as inconels, inconel and low alloy steels, stainless steels and low alloy steels.	