MAG WELDING CONSUMABLES

Classification	Brand name	Dia. (mm)	Equivalent specification	Welding position	Shielding gas	Type of current	Typical chemical composition of all-weld-metal (%)					
							C	Si	Mn	Cr	Ni	Mo
For mild steel	K-61T	1.2~1.6	AWS E61T-G JIS YFW-A430R KS YFW-A430R	F, V, OH, H, VD	80%Ar+20%CO_2	DC(+)	0.03	0.12	0.80	–	–	–
For high tensile strength steel (490MPa)	K-71T	1.2~2.4	AWS E71T-1 JIS YFW-C50DR KS YFW-C50DR	F, V, OH, H, VD	CO_2	DC(+)	0.04	0.45	1.30	–	–	–
	K-71TLF	1.2~2.4	AWS E71T-1 JIS YFW-C502R KS YFW-C502R	F, V, OH, H, VD	CO_2	DC(+)	0.03	0.38	1.35	–	–	–
	K-71TM	1.2~2.4	AWS E71T-1M JIS YFW-A50DR KS YFW-A50DR	F, V, OH, H	80%Ar+20%CO_2	DC(+)	0.03	0.59	1.44	–	–	–
	K-70TB	1.2~2.4	AWS E70T-5M JIS YFW-A502B KS YFW-A502B	F, H-Fil	80%Ar+20%CO_2	DC(+)	0.04	0.34	1.30	–	–	–
	K-71TB	1.2~2.4	AWS E71T-5/-5M JIS YFW-C502B KS YFW-C502B	F, V, OH, H	CO_2	DC(+)	0.02	0.60	1.60	–	–	–
	K-70T	1.2~1.6	AWS E70T-1/-1M JIS YFW-C50DM KS YFW-C50DM	F, H-Fil	CO_2	DC(+)	0.03	0.50	1.45	–	–	–
	K-70ST	1.2~1.6	AWS E70T-1 JIS YFW-C502R KS YFW-C502R	F, H-Fil	CO_2	DC(+)	0.04	0.49	1.36	–	–	–
	KX-100	1.2~1.6	AWS E70C-3C JIS YFW-C50DM KS YFW-C50DM	F, H-Fil	CO_2	DC(+)	0.04	0.54	1.55	–	–	–
	KX-200	1.2~2.4	AWS E70T-1 JIS YFW-C50DM KS YFW-C50DM	F, H-Fil	CO_2	DC(+)	0.04	0.41	1.25	–	–	–
	KX-200H	1.2~1.6	AWS E70T-1 JIS YFW-C502M KS YFW-C502M	F, H-Fil	CO_2	DC(+)	0.04	0.56	1.61	–	–	–
	KX-70CM	1.2~1.6	AWS E70C-3M JIS YFW-A50DM KS YFW-A50DM	F, H-Fil	CO_2	DC(+)	0.03	0.40	1.60	–	–	–
	KX-706M	1.2~1.6	AWS E70C-6M JIS YFW-A502M KS YFW-A502M	F, H-Fil	CO_2	DC(+)	0.04	0.60	1.50	–	–	–
	K-NGS4	1.6~3.2	AWS E70T-4 JIS YFW-S50GB KS YFW-S50GB	F, H-Fil	–	DC(+)	0.17	0.22	1.80	Al : 1.32		
	K-NGS10	1.2~2.0	AWS E71T-10 JIS YFW-S50GB KS YFW-S50GB	F, H-Fil, V	–	DC(—)	0.10	0.11	0.53	Al : 1.10		
	K-NGS11	1.2~2.0	AWS E71T-11 JIS YFW-S50GB KS YFW-S50GB	F, H-Fil, V	–	DC(—)	0.10	0.10	0.55	Al : 1.20		
	K-NGS	1.2~2.0	AWS E71T-GS JIS YFW-S50GB KS YFW-S50GB	F, H-Fil, V	–	DC(±)	0.16	0.31	0.82	Al : 1.30		
For high tensile strength steel (550~900MPa)	K-81T	1.2~1.6	AWS E81T1-Ni1 JIS YFW-C602R KS YFW-C602R	F, V , H H-Fil	CO_2	DC(+)	0.04	0.35	1.17	–	1.00	–
	K-82T	1.2~1.6	AWS E81T1-Ni2	F, H-Fil, V	CO_2	DC(+)	0.03	0.48	1.26	–	2.00	–
	KX-300	1.2~1.6	AWS E80T1-Ni1 JIS YFW-C602M KS YFW-C602M	F, H-Fil	CO_2	DC(+)	0.02	0.47	1.34	–	0.97	–
	K-91T	1.2~1.6	AWS E91T1-Ni1 JIS YFW-C602R KS YFW-C602R	F, V, OH H, VD	CO_2	DC(+)	0.03	0.42	1.37	–	0.93	–
	K-110TK3	1.2~1.6	AWS E110T1-K3	F, H-Fil,VD	CO_2	DC(+)	0.04	0.51	1.72	–	2.04	0.42
For atmospheric corrosion resisting steel	K-71TW	1.2~1.6	AWS E81T1-W2 JIS YFA-50W KS YFA-50W	F, H-Fil,VD	CO_2	DC(+)	0.05	0.54	1.10	0.55	0.45	Cu 0.42

Typical mechanical properties of all-weld-metal			Application	Approvals
T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
487 {49}	31	20 {2} (-20℃)	All position welding of POS-AG steel and low silicon steel for single and multi-pass applications.	–
580 {59}	29	50 {5} (-20℃)	MAG Welding of storage vessels, shipbuilding, and other structural fabrications.	ABS, BV, CCS, CWB, DNV,GL, KR, LR, NK, RINA, JIS, KS
570 {58}	28	60 {6} (-20℃)	MAG Welding of storage vessels, shipbuilding, heavy industry and other structural fabrications.	ABS, BV, CCS, DNV, GL, KR, LR, NK, RINA, TUV, JIS, KS
570 {59}	29	60 {6} (-20℃)	All position welding of machinery, shipbuildings, bridges and vehicles.	ABS, BV, DNV, LR, RINA,TÜV, JIS, KS
550 {56}	29	50 {5} (-30℃)	MAG Welding of storage vessels, shipbuilding and other structural fabrications.The toughness and crack resistance of the weld metal have been improved by a lime-fluoride base slag.	–
610 {32}	30	50 {5} (-30℃)	Butt and fillet welding of carbon steel for machinery, cars, shipbuilding, birdges, ets.	–
570 {58}	25	65 {7} (-20℃)	Flat and H-fillet welding of medium and heavy thick plate with higher deposition rate.	CWB, JIS, KS
584 {59}	28	50 {5} (-20℃)	For fillet welding of inorganic zinc-rich primer coated steels,often used in the machinery, steel fabrications and bridge construction industries	ABS, BV, DNV, GL, KR, LR, NK, JIS, KS
550 {60}	29	60 {6} (-20℃)	Butt and fillet welding of steel structures such as industrial machinery.	ABS, BV, DNV, GL, KR,LR, NK, JIS, KS
550 {56}	27	60 {6} (-20℃)	Flat and H-fillet welding of medium and heavy thick plate with higher deposition rate.	ABS, BV, CCS, DNV, GL, KR,LR, NK, TÜV, JIS, KS
540 {55}	29	55 {6} (-20℃)	For fillet welding of inorganic zinc-rich primer coated steels, often used in the machinery, steel fabrications and bridge construction industries. Welding speed is very high(Twin-Tandem 1000mm/min)	ABS, DNV, GL, KR, LR, JIS, KS
540 {55}	29	55 {6} (-20℃)	Butt and fillet welding of steel structures such as shipbuilding and construction machines, etc.	ABS, BV, DNV, GL, LR, RINA, JIS, KS
610 {62}	27	55 {6} (-30℃)	Butt and fillet welding of steel structures such as shipbuilding and construction machines, etc.	ABS, BV, CWB, DNV, GL, LR, RINA , JIS
545 {55}	23	–	The welding of heavy machinery, large constuction components where appropriate in barge building. The wire is intended for single- and multiple-pass welding in the flat and horizontal positions.	–
530 {54}	22	–	Lap and fillet welding for single pass applications.	–
530 {54}	23	–	For single and multi-pass of groove welds and fillet welds.	–
570 {53}	22	–	For single-pass of groove welds in the flat welding position and fillet welds on sheet metal.	–
630 {64}	28	45 {5} (-30℃)	All position MAG welding of 590MPa class high tensile strength steel of construction structure, machinery, bridges and storage tanks.	–
673 {68}	24	45 {5} (-40℃)	MAG welding of 590MPa class Al-killed steel for low-temperature service. The weld metal contains about 2.0% Ni and good impact value at low temperature down to -40℃	–
640 {65}	25	47 {5} (-30℃)	For flat or horizontal fillet (tandem) MAG welding of mild and 590MPa high tensile steel. Recommended for petro-chemical applications, machinery steels, bridge construction industries.	–
725 {74}	22	87 {9} (-30℃)	For gas-shielded metal arc welding of 600 MPa high tensile steel for low temperature service. For all-position work with many high-strength low alloy steels such as ASTM A302, A572, A575, A734	–
834 {85}	21	50 {5} (-20℃)	For high strength steel application as HY 80 Grade and ASTM A514, A517,A710, All position gas shielded 1.8%Mn-2%Ni-0.55%Mo alloyed Flux cored arc welding wire..	ABS, CWB
590 {60}	28	40 {4} (-30℃)	Butt and fillet welding of carbon steel and 490MPa class high tensile strength weather proof steel.	–

MAG WELDING CONSUMABLES

Classification	Brand name	Dia. (mm)	Equivalent specification	Welding position	Shielding gas	Type of current	Typical chemical composition of all-weld-metal (%)					
							C	Si	Mn	Cr	Ni	Mo
For atmospheric corrosion resisting steel	K-81TW	1.2~1.6	AWS E81T1-W2 JIS YFA-58A KS YFA-58A	F, H-Fil,VD	CO_2	DC(+)	0.05	0.54	1.20	0.55	0.55	Cu 0.45
For low temperature service steel	K-71UT	1.2~1.6	AWS E71T1-1/-9J JIS YFL-C504R KS YFL-C504R	F, V ,OH H, VD	CO_2	DC(+)	0.04	0.30	1.35	–	0.39	–
	K-71TSR	1.2~1.6	AWS E71T-12J JIS YFL-C504R KS YFL-C504R	F, V, H, H-Fill	CO_2	DC(+)	0.02	0.45	1.41	–	0.41	–
	K-80TK2	1.2~1.6	AWS E80T1-K2 JIS YFL-C506M KS YFL-C506M	F, H-Fil	CO_2	DC(+)	0.03	0.45	1.50	–	1.50	–
	K-81TK2	1.2~1.6	AWS E81T1-K2 JIS YFL-C506R KS YFL-C506R	F, V, OH, H, VD	CO_2	DC(+)	0.03	0.46	1.45	–	1.50	–
	K-81TSR	1.2~1.6	AWS E81T1-K2 JIS YFL-C506R KS YFL-C506R	F, V, H, H-Fill	CO_2	DC(+)	0.02	0.31	1.21	–	1.47	–
For heat-resisting steel	K-81TA1	1.2~1.6	AWS E81T1-A1 JIS YFM-C KS YFM-C	F, V, OH H, VD	CO_2	DC(+)	0.02	0.55	1.21	–	–	0.53
	K-81TB2	1.2~1.6	AWS E81T-B2 JIS YF1CM-C KS YF1CM-C	F, V, H H-Fill,	CO_2	DC(+)	0.04	0.44	1.08	1.25	–	0.53
	K-91TB3	1.2~1.6	AWS E91T1-B3 JIS YF2CM-C KS YF2CM-C	F, V, H H-Fill	CO_2	DC(+)	0.05	0.51	1.18	2.25	–	1.00
	K-91TB9	1.2~1.6	–	F, V, H H-Fill	80%Ar+20%CO_2	DC(+)	0.12	0.25	0.72	10.3	0.70	1.00

Typical mechanical properties of all-weld-metal			Application	Approvals
T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
630 {64}	28	60 {6} (-30℃)	Butt and fillet welding of high tensile strength weather-proof steel, for example ASTM A-242 or A-588, which is used normally without painting, for shipbuildings. and bridges, etc.	–
600 {61}	26	55 {5} (-40℃)	All position gas shielded 0.4%Ni alloyed Flux cored arc welding wire. Typical applications are railcar, automotive, heavy equipment and general structual steel fabrications.	ABS, BV, DNV, GL, KR, NK, LR, JIS, KS
621 {63}	25	119 {12} (-40℃)	All position gas shielded 0.4%Ni alloyed Flux cored arc welding wire. Applications are railcar, automotive, machinery, shipbuilding and heavy equipment etc .(NACE.API steel)	ABS, BV, DNV, GL, KR, LR, NK
640 {65}	25	50 {5} (-60℃)	MAG welding of Al-killed steel which are used for low temperature service steel at down to -60℃ for offshore structures of LPG carriers.	ABS, BV, DNV, GL, KR, LR, NK, JIS, KS
650 {66}	25	60 {6} (-60℃)	Butt and fillet welding of 1.5% Ni steel and Al-killed steel. For low temperature service steel at down to -60℃for offshore structures of LPG carriers.	ABS, BV, DNV, GL, KR, LR, NK, JIS, KS
640 {65}	25	97 {10} (-60℃)	For gas shielded metal arc welding of 600MPa high tensile steel for low temperature service. LNG and LPG carriers and storage tank etc. (Acceptable for CTOD characteristics.)	–
637 {65}	25	PWHT : 620℃ X 1hr. S · R	Single-and Multi-pass welding in all positions using 100%CO_2 shielding gas for steam pipes of boilers, oil refining industries, casting and pressure vessels for high temperature service.	–
600 {61}	25	PWHT : 690℃ X 1hr. S · R	For welding of 1.25%Cr-0.5%Mo steel for main steam pipes of boilers for electric power and equipment oil fefining industries and high temperature synthetic industries.	–
680 {69}	24	PWHT : 690℃ X 1hr. S · R	For welding of 2.25%Cr-1%Mo steel used for steam pipes of boilers, oil refining industry casting and pressure vessels for high temperature service.	–
810 {82}	15	PWHT : 760℃ X 1hr. S · R	Butt and fillet welding of 9%Cr-1% Mo-Ni-Nb-V steel used for high pressure boilers. Applications are ASTM A189-F91, A199-T91, A231-T91, A369-FP91, A387-Gr91	–

Classification	Brand name	Dia. (mm)	Equivalent specification	Welding position	Shielding gas	Type of current	Typical chemical composition of all-weld-metal (%)					
							C	Si	Mn	Cr	Ni	Mo
For hardfacing	K-250HT	1.2~1.6	JIS YF2A-C-250 KS YF2A-C-250	F, H-Fil	CO_2	DC(+)	0.07	0.50	1.59	1.30	–	–
	K-300HT	1.2~1.6	JIS YF2A-C-300 KS YF2A-C-300	F, H-Fil	CO_2	DC(+)	0.09	0.68	1.54	1.10	–	–
	K-350HT	1.2~1.6	JIS YF2A-C-350 KS YF2A-C-350	F, H-Fil	CO_2	DC(+)	0.12	0.45	1.37	1.30	–	0.20
	K-450HT	1.2~1.6	JIS YF2A-C-450 KS YF2A-C-450	F, H-Fil	CO_2	DC(+)	0.24	0.51	1.20	2.00	–	0.60
	K-500HT	1.2~1.6	JIS YF3B-C-500 KS YF3B-C-500	F, H-Fil	CO_2	DC(+)	0.19	2.06	0.35	5.26	–	0.59
	K-600HT	1.2~1.6	JIS YF3B-C-600 KS YF3B-C-600	F, H-Fil	CO_2	DC(+)	0.25	2.18	0.36	6.5	–	0.50
	K-700HT	1.2~1.6	JIS YF3B-C-700 KS YF3B-C-700	F, H-Fil	CO_2	DC(+)	0.30	2.40	0.50	7.0	W:0.70	
	K-800HT	1.2~1.6	JIS YF3B-C-800 KS YF3B-C-800	F, H-Fil	CO_2	DC(+)	0.44	1.5	0.55	8.6	W:0.50	
	K-CXA-40HT	1.2~1.6	JIS YF4B-C-350 KS YF4B-C-350	F, H-Fil	98%Ar+2%O_2	DC(+)	0.05	0.25	0.30	12.0	4.20	–
	K-CXA-41HT	1.2~1.6	JIS YF4B-C-350 KS YF4B-C-350	F, H-Fil	98%Ar+2%O_2	DC(+)	0.05	0.39	0.49	12.1	3.90	1.10

Hardness of all-weld-metal			Application	Approvals
Hv	H_RC	Hs		
260	24	37	MAG welding for metal-to-metal wearing and underlayer welding of hardsurfacing Low spatter level, easy salg removal and reduced grinding time after work handening.	–
300	30	42	MAG welding for hardfacing and repairing rollers, shafts and wheels etc. It can be possible to get abrasion resistance with proper preheat and interpass temperature.	–
360	37	50	MAG welding wire with higher hardness for metal-to-metal wear and mild abrasion. Used on transfer rollers and idlers, crane wheels and shafts etc.	–
450	45	61	MAG welding wire for metal-to-metal wearing or abrasion. The weld metal is of mertensite structure and has stable hardness because it contains carbide forming elements.	–
510	50	66	K-500HT can be used on carbon, medium carbon, low alloy, manganese steel. It is especially suitable for overlaying thin gauge materials, bulding up edges, crusher rolls etc.	–
590	55	73	MAG welding wire produces a deposit which resists metal-to-metal wear and mild abrasion It can be used for crane wheels, blower blades, bucket lips, dredge parts etc.	–
690	60	80	MAG welding wire for heavy abrasion resistance with martensitic stucture. It can be used for crusher hammers, ore chuter, dozer blades, ripper teeth, bucket lips etc.	–
780	63	87	MAG welding for heavy abrasion resistance with martensitic stucture. It can be used for Augers, bucket lips, conveyor screws, blower blades, dozer blades etc.	–
370	38	51	MAG welding wire for metal-to-metal wearing and underlayer welding of hardsurfacing It can be used for tractor rollers, trunnions, crane wheels, track rails, idlers, etc.	–
370	38	51	MAG welding wire for metal-to-metal wearing, abrasion and corrosion. It can be used for tractor rollers, shafts, rollrs, valves, track rails, idlders, etc.	–

MAG WELDING CONSUMABLES

Classification	Brand name	Dia. (mm)	Equivalent specification	Welding position	Shielding gas	Type of current	Typical chemical composition of all-weld-metal (%)					
							C	Si	Mn	Cr	Ni	Mo
For stainless steel	K-308T	1.2~1.6	AWS E308T0-1/-4 JIS YF308C KS YF308C	F, H-Fil	CO_2 /Ar+CO_2	DC(+)	0.05	0.60	1.55	19.5	10.5	–
	K-308LT	1.2~1.6	AWS E308LT1-1/-4 JIS YF308LC KS YF308LC	F, V, OH H, VD	CO_2 /Ar+CO_2	DC(+)	0.03	0.62	1.56	19.5	10.5	–
	K-308LF	1.2~1.6	AWS E308LT0-1/-4 JIS YF308LC KS YF308LC	F, H-Fill	CO_2 /Ar+CO_2	DC(+)	0.03	0.52	1.70	20.3	10.4	–
	K-309T	1.2~1.6	AWS E309T0-1/-4 JIS YF309C KS YF309C	H-Fil	CO_2 /Ar+CO_2	DC(+)	0.05	0.58	1.45	23.5	13.0	–
	K-309LT	1.2~1.6	AWS E309LT1-1/-4 JIS YF309LC KS YF309LC	F, V, OH, H, VD	CO_2 /Ar+CO_2	DC(+)	0.03	0.60	1.40	23.6	13.1	–
	K-309LF	1.2~1.6	AWS E309LT1-1/-4 JIS YF309LC KS YF309LC	F, H-Fil	CO_2 /Ar+CO_2	DC(+)	0.03	0.65	1.55	24	13.2	–
	K-309LMT	1.2~1.6	AWS E309L JIS YF309LG KS YF309LG	F, H-Fil	98%Ar+2%O_2	DC(+)	0.03	0.48	1.57	23.9	12.4	–
	K-309MoLT	1.2~1.6	AWS E309LMoT1-1 JIS YF309MoLC KS YF309MoLC	F, V, OH, H, VD	CO_2	DC(+)	0.03	0.54	1.30	23.7	13	2.70
	K-312T	1.2~1.6	AWS E312T1-1	F, V, OH, H, VD	CO_2	DC(+)	0.04	0.83	1.00	30.2	9.5	0.22
	K-316T	1.2~1.6	AWS E316T0-1/-4 JIS YF316C KS YF316C	F, H-Fil	CO_2 /Ar+CO_2	DC(+)	0.05	0.60	1.47	18.4	12	2.50
	K-316LT	1.2~1.6	AWS E316LT1-1/-4 JIS YF316LC KS YF316LC	F, V, OH, H, VD	CO_2 /Ar+CO_2	DC(+)	0.03	0.65	1.20	18.3	12.2	2.80
	K-316LF	1.2~1.6	AWS E316LT0-1/-4 JIS YF316LC KS YF316LC	F, H-Fil	CO_2 /Ar+CO_2	DC(+)	0.03	0.65	1.58	19.4	12.4	2.42
	K-317LT	1.2~1.6	AWS E317LT1-1 JIS YF317LC KS YF317LC	F, V, OH, H, VD	CO_2	DC(+)	0.03	0.65	1.25	18.8	13.7	3.50
	K-329T	1.2~1.6	AWS E2209T1-1/4	F, V, OH, H, VD	CO_2 /Ar+CO_2	DC(+)	0.03	0.49	1.67	23.1	9.66	2.84
	K-347T	1.2~1.6	AWS E347T1-1 JIS YF347C KS YF347C	F, V, OH, H, VD	CO_2	DC(+)	0.05	0.63	1.75	19.5	10.5	Nb: 0.50
	K-409TiT	1.2~1.6	AWS EC409	F, H-Fil	98%Ar+2%O_2	DC(+)	0.05	0.50	0.45	12.1	Ti : 0.70	
	K-409TiC	1.2~1.6	AWS EC409	F, H-Fil	98%Ar+2%O_2	DC(+)	0.03	0.55	0.60	11.4	Ti : 1.00	
	K-410T	1.2~1.6	AWS E410T0-1/-4 JIS YF410C KS YF410C	F, H-Fil	CO_2 /Ar+CO_2	DC(+)	0.07	0.20	0.47	13	–	–
	K-410NiMoT	1.2~1.6	AWS E410NiMoT0-4	F, H-Fil	Ar+20%CO_2	DC(+)	0.04	0.23	0.36	12.2	4.1	0.7
	K-430T	1.2~1.6	AWS E430T0-G JIS YF430 KS YF430	F, H-Fil	98%Ar+2%O_2	DC(+)	0.02	0.61	0.49	16.2	Ti : 1.00	
	K-436T	1.2~1.6	–	F, H-Fil	98%Ar+2%O_2	DC(+)	0.03	0.35	0.63	17.5	Ti: 0.50	1.06
	K-439T	1.2~1.6	–	F, H-Fil	98%Ar+2%O_2	DC(+)	0.03	0.33	0.64	17.8	Ti: 0.30	–

Typical mechanical properties of all-weld-metal			Application	Approvals
T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
580 {59}	38	–	MAG weding of 18%Cr-8%Ni stainless steel (STS 301, 302, 304, and 308) corrosion resistibility and mechanical properties of the weld metals are superior in as-welded condition.	ABS, BV, DNV, KR, NK,JIS
570 {58}	42	–	MAG weding of low carbon 18%Cr-8%Ni stainless steel (STS 301, 302, 304L, and 308L) As a rutile flux- cored wire, specially designed to operate in the vertical and overhead positions.	ABS, BV, CWB, KR, JIS TÜV, NK
620 {63}	38	–	An austenite stainless steel flat-position gas shielded flux-cored wire with low carbon used for joining common austenite stainless steel such as type of STS 301, 302, 304L, and 304L	JIS
590 {60}	36	–	MAG weding of 22%Cr-12%Ni stainless steel. Corrosion resistibility and mechanical properties of the weld metal are superior in as-welded condition.	ABS, BV, DNV, KR, LR, NK, JIS
550 {56}	41	–	MAG welding of a dissimilar joint consisiting of a stainless steel and a carbon steel or a low alloy steel. The principal application is the vertical and overhead joining of disimilar and difficult to weld steels.	ABS, BV, CWB, DNV, KR, LR, NK, PINA, TÜV, JIS
630 {64}	40	–	An austenite stainless steel flat-position gas shieldied flux-cored wire with low carborn containing 22%Cr-12%Ni used for the welding of dissimilar metals such as stainless steel to mild or alloy steel.	JIS
560 {57}	40	–	Butt and fillet welding of automobile muffler (STS 304L, 409) or low carbon 22%Cr-12%Ni stainless steels. Welding of dissimilar metal such as carbon steel to stainless steels.	JIS
670 {68}	32	–	Welding of dissimilar metals such as molybdenum-contained austenitic stainless steels to carbon steel,the first pass in 316(L) clad steel.	KR, JIS
760 {77}	25	–	MAG welding of 30%Cr-9%Ni stainless steel (STS 304, 308, 312) The principal application is the vertical and overhead joining of dissimilar and difficult to weld steels.	JIS
580 {59}	38	–	MAG welding of 18%Cr-12%Ni-2%Mo stainless steel (STS 316). Heat resistibility and mechanical properties of the weld metals are superior in as-welded condition.	ABS, KR, JIS
550 {56}	40	–	MAG welding of low carbon 18%Cr-12%Ni-2%Mo stainless steel (STS 316L, 316Ti, 316Cb). As a rutile flux-cored wire, specially designed to operate in the vertical and overhed positions.	ABS, BV, CWB, DNV KR, NK, RINA, TÜV, JIS
600 {61}	39	–	An austenite stainless steel flat-position gas shielded flux-cored wire with low carbon used for joining common austenite stainless steel such as types of STS 316L,316Ti,316Cb.	JIS
610 {62}	33	–	MAG welding wire applicable to low carbon 18%Cr-12%Ni-2%Mo-N stainless steel (STS 316LN) and low carbon 19%Cr-13%Ni-3%Mo stainless steel (STS 317L)	ABS, JIS
816 {83}	27	–	All positional, flux-cored wire for the welding of duplex stainless steel. The structure of the all-weld metal is austenitic-ferrite (FN 35 ~ 50). The pitting corrosion resistance factor PRE(N) is higer than 35.	ABS
680 {69}	34	–	MAG welding wire appplicable to 18%Cr-8%Ni-Nb stainless steel (STS 347) and 18%Cr-8%Ni-Ti stainless steel (STS 321). It is used in the chemical and process plant industries.	–
560 {57}	17	–	A titanium-stabilised, 12%Cr-Ti metal-cored wire for welding ferritic (STS 409)stainless steel. It is suited for use on robots within the automotice industry for vehicle exhaust systems.	ABS
–	–	–	A titanium-stabilised, 12%Cr-Ti metal-cored wire for welding ferritic (STS 409) stainless steel. It is developed to meet the needs of the auto-motive exhaust fabricators that desired a metal-cored wire.	–
530 {54}	24	PWHT : 750℃ X 1hr. S · R	MAG welding wire applicable to 13%Cr stainless steel (STS 403, 410)	–
870 {89}	25	PWHT : 600℃ X 1hr. S · R	MAG welding wire applicable to 13%Cr-4%Ni-Mo stainless steel (STS 403, 405, 410, 420) and surfacing to resist corrosion, erosion or abrasion.	–
535 {54}	25	PWHT : 760℃ X 1hr. S · R	A titanium-stabilised, 16%Cr-Ti metal-cored wire for welding ferritic (STS 430) stainless steel. It is suited for use on robots within the automotive industry for vehicle exhaust systems.	–
477 {49}	23	–	A titanium-stabilised, 17%Cr-1%Mo-Ti metal-cored wire for welding ferritic (STS 436) stainless steel. It is suited for use on robots within the automotive industry for vehicle exhaust systems.	–
501 {51}	22	–	A titanium-stabilised, 18%Cr-Ti metal-cored wire for welding ferritic (STS 439) stainless steel. It is suited for use on robots within the automotive industry for vehicle exhaust systems.	–

Solid wires

MAG WELDING CONSUMABLES

Classification	Brand name	Dia. (mm)	Equivalent specification	Welding position	Shielding gas	Type of current	Typical chemical composition of all-weld-metal (%)					
							C	Si	Mn	P	S	Mo
For high tensile strength steel (490 Mpa)	KC-25	0.8~1.6	AWS ER70S-3 JIS YGW14 KS YGW14	F, V, OH, H	CO_2	DC(+)	0.10	0.45	0.90	0.015	0.009	–
	KC-25M	0.8~1.6	AWS ER70S-3 JIS YGW16 KS YGW16	F, V, OH, H	Ar+20%CO_2	DC(+)	0.10	0.50	1.02	0.015	0.009	–
	KC-26	0.8~1.6	AWS ER70S-G JIS YGW11 KS YGW11	F, V, OH, H	CO_2	DC(+)	0.11	0.55	1.31	0.014	0.011	–
	KC-27	0.8~1.6	AWS ER70S-G JIS YGW15 KS YGW15	F, V, OH, H	Ar+20%CO_2	DC(+)	0.08	0.44	0.98	0.014	0.010	–
	KC-28	0.8~1.6	AWS ER70S-6 JIS YGW12 KS YGW12	F, V, OH, H	CO_2	DC(+)	0.08	0.50	1.05	0.014	0.010	–
	KC-70S2	0.8~1.6	AWS ER70S-2	F, V, OH, H	CO_2	DC(+)	0.05	0.29	0.66	0.012	0.007	–
	ZO-25	0.8~1.6	AWS ER70S-3 JIS YGW14 KS YGW14	F, V, OH, H	CO_2	DC(+)	0.10	0.45	0.90	–	–	–
	ZO-26	0.8~1.6	AWS ER70S-G JIS YGW11 KS YGW11	F, V, OH, H	CO_2	DC(+)	0.11	0.55	1.31	–	–	–
	ZO-27	0.8~1.6	AWS ER70S-G JIS YGW15 KS YGW15	F, V, OH, H	Ar+20%CO_2	DC(+)	0.08	0.44	0.98	–	–	–
	ZO-28	0.8~1.6	AWS ER70S-6 JIS YGW12 KS YGW12	F, V, OH, H	CO_2	DC(+)	0.08	0.50	1.05	–	–	–
For high tensile strength steel (550~690 Mpa)	ZO-60	0.8~1.6	AWS ER80S-G JIS YGW21 KS YGW21	F, V, OH, H	CO_2	DC(+)	0.07	0.59	1.47	–	–	0.28
	ZO-55	1.2~1.6	AWS ER70S-G JIS YGW18 KS YGW18	F, V, OH, H	CO_2	DC(+)	0.07	0.78	1.55	0.014	0.009	–
For heat-resisting steel	KC-80D2	0.8~1.6	AWS ER80S-D2 JIS YGM-C KS YGM-C	F, V, OH, H	CO_2	DC(+)	0.11	0.32	1.24	–	0.48	–
	KC-80SB2	1.2~1.6	AWS ER80S-B2 JIS YG1CM-G KS YG1CM-G	F, V, OH, H	Ar+2%CO_2	DC(+)	0.10	0.4	0.41	0.011	0.015	–
	KC-90SB3	1.2~1.6	AWS ER90S-B3 JIS YG2CM-G KS YG2CM-G	F, V, OH, H	Ar+2%CO_2	DC(+)	0.10	0.38	0.40	0.011	0.015	–

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]		
430 {43}	520 {53}	33	90 {9} (-18℃)	Welding of cars, sheet metals and general fabrications.	ABS, CWB, KR, LR, NK, DNV, JIS, KS
440 {45}	540 {55}	30	100 {10} (-18℃)	Welding of structural steel, ships, bridges and industrial machinery.	–
490 {50}	560 {57}	29	110 {11} (-18℃)	Welding of structural steel, ships, bridges, boilers and pressure vessels.	ABS, BV, DNV, KR, LR, NK, GL, JIS, KS
490 {50}	560 {57}	31	160 {16} (-18℃)	Welding of automobiles, bridges, structural steels, machinery and ships.	ABS, DNV, NK, JIS
450 {46}	550 {56}	30	90 {9} (-29℃)	Welding of general shop fabrications, construction works, and electric products.	ABS, BV, DNV, GL, KR, LR, NK, CCS, CWB, JIS, KS, TÜV
490 {50}	550 {56}	29	80 {8} (-29℃)	Welding of automobiles, structure steel, machinery and ships.	–
430 {44}	520 {53}	33	90 {9} (-18℃)	Welding of cars, sheet metals and general fabrications.	–
490 {50}	560 {57}	29	110 {11} (-18℃)	Welding of structural steel, ships, bridges, boilers and pressure vessels.	ABS, KR, LR, NK, JIS, KS
490 {50}	560 {57}	31	160 {16} (-18℃)	Welding of automobiles, bridges, structural steels, machinery and ships.	ABS, DNV, LR, NK, JIS
450 {46}	550 {56}	30	90 {9} (-29℃)	Welding of general shop fabrications, construction works and electric products.	ABS, LR, NK, JIS, KS
550 {56}	640 {65}	27	110 {11} (-18℃)	Welding of 590N/mm² class high tensile strength steel.	NK, JIS
580 {59}	640 {65}	27	170 {17} (-29℃)	Butt and fillt welding of mild steel & 540N/㎟ class high tensile strength steel. Construction Equipment, Bridges and Building	–
590 {60}	660 {67}	22	50 {5} (-29℃)	Welding of 0.5% Mo steel.	–
500 {51}	580 {59}	25	80 {8} (-29℃)	Welding of 1.25%Cr-0.5 Mo Heat Resistant steels.	–
570 {58}	660 {67}	24	80 {8} (-29℃)	Welding of 2.25%Cr-1% Mo Heat Resistant steels	–

TIG · MIG WELDING CONSUMABLES

Classification	Brand name		Size (mm)	Equivalent specification	Typical chemical composition of rod or wire (%)					
	TIG	MIG			C	Si	Mn	Cr	Ni	Mo
For high tensile strength steel (490 Mpa)	T-50	–	TIG ; Dia. : 1.2 - 3.2 Length : 1,000	AWS ER70S-6 JIS YGT 50	0.08	0.82	1.52	–	–	–
	T-50G	–		AWS ER70S-G JIS YGT 50	0.09	0.70	1.50	–	–	–
	T-53	–		AWS ER70S-3 JIS YGT 50	0.07	0.65	1.18			–
	T-70S2	–		AWS ER70S-2 JIS YGT 50	0.05	0.50	1.09	–	–	–
For high-resisting steel	T-80D2	–		AWS ER80S-D2 JIS YGT60	0.08	0.63	1.85			0.5
	T-80SB2	–		AWS ER80S-B2 JIS YGT1CM	0.10	0.43	0.44	1.27	–	0.43
	T-90SB3	–		AWS ER90S-B3 JIS YGT2CM	0.10	0.40	0.42	2.33	–	0.43

Typical mechanical properties of all-weld-metal		Application	Approvals	
T.S N/mm² [kgf/mm²]	El. (%)		TIG	MIG
580 {59}	30	Welding of pipes, steel sheets, plates and other structural steel where the requirements for quality and finish are exacting.	ABS	–
580 {59}	32	Welding of mild steel, 490N/mm high tensile steel and aluminum-killed steel for low temperature use. It is suitable for root pass welding of pipes and all position welding of thin plates.	–	–
550 {56}	32	Welding of pipes, steel sheets, plates and other structural steels where the requirements for quality and finish are exacting.	–	–
570 {58}	29	Welding of pipes, steel sheets, plates and other structural steels.	–	–
700 {71}	22	Welding of 0.5% Mo steel	–	–
500 {51}	26	Welding of 1.25%Cr-0.5%Mo Heat Resistant steels.	–	–
680 {68}	26	Welding of 2.25%Cr-1%Mo Heat Resistant steels.	–	–

TIG · MIG WELDING CONSUMABLES

Classification	Brand name		Size (mm)	Equivalent specification	Typical chemical composition of all-weld-metal (%)						Typical mechanical properties of all-weld-metal		Application	Approvals	
	TIG	MIG			C	Si	Mn	Cr	Ni	Mo	T.S N/mm² [kgf/mm²]	El. (%)		TIG	MIG
For stainless steel	T-2209	M-2209	TIG ; Dia. : 1.2 - 4.0 Length : 1,000 MIG ; Dia. : 0.8 - 1.6	AWS ER2209	0.01	0.4	1.75	22.7	8.7	3.2	840 {86}	28	Welding of 22%Cr-9%Ni-3%Mo (UNS S31803, S32900) steels.		
	-	M-307LSi		EN 12072 G188Mn	0.07	0.8	7.1	18.0	8.0	–	610 {62}	40	Welding of dissimilar steel such as austenitic manganese sgteel to carbon steel forgings.		
	T-308	M-308		AWS ER308 JIS Y308	0.04	0.38	1.90	19.8	9.8	–	610 {62}	42	Welding of AISI Types 301, 302, 304 and 308.		
	T-308L	M-308L		AWS ER308L JIS Y308L	0.02	0.38	1.90	19.8	9.8	–	570 {58}	44	Welding of low carbon 18%Cr-8%Ni steel such as AISI Types 304L and 308L.	BV, DNV, KR, CWB, TÜV	CWB
	T-308H	M-308H		AWS ER308H	0.05	0.42	2.06	19.90	9.70	–	590 {60}	42	Welding of high carbon 18%Cr-8%Ni steel (AISI 304H)		
	T-308LSi	M-308LSi		AWS ER308LSi JIS Y308LSi	0.02	0.75	1.95	19.7	10.4	–	590 {60}	42	Improves the usability of the filler metal, welding of low carbon 18%Cr-8%Ni steels.	CWB	CWB, TÜV
	T-309	M-309		AWS ER309 JIS Y309	0.05	0.36	1.84	23.6	13.3	–	610 {62}	40	Welding of base metals of similar alloys in wrought or cast forms. Welding of dissimilar steel such as Type 304 to carbon steel or low alloy steels.		BV
	T-309L	M-309L		AWS ER309L JIS Y309L	0.01	0.40	1.92	23.2	13.8	–	570 {58}	42	Welding of similar alloys in wrought or cast forms. Joining of Type 304 to carbon steel and welding the clad side of Type 304 clad steels.	BV, DNV, KR, CWB	CWB
	T-309LSi	M-309LSi		AWS ER309LSi JIS Y309LSi	0.02	0.75	2.28	23.2	13.7	–	590 {60}	40	Welding of similar alloys in wrought or cast forms. Joining of Type 304 to carbon steel and welding the clad side of Type 304 clad steels.		
	T-309LMo	M-309LMo		EN 1207Z G 2312SL	0.02	0.45	1.45	14.50	21.40	2.61	660 {67}	33	Sutabile for dissimilar metal joint and underlaying on ferritic steels for overlaying stainless steel weld metals.		
	T-310	M-310		AWS ER310 JIS Y310	0.10	0.10	1.73	26.6	20.9	–	600 {61}	40	Welding of similar composition base metals .		
	T-312	M-312		AWS ER312 JIS Y312	0.10	0.43	1.72	8.70	30.4	–	730 {75}	30	Welding of cast alloys of similar aomposition.Welding of dissimilar metals such as carbon steel to stainless steel.		
	T-316	M-316		AWS ER316 JIS Y316	0.04	0.40	1.62	19.1	12.1	2.3	580 {59}	38	Welding of 18%Cr-12%Ni-Mo steel.(AISI Type 316)		
	T-316L	M-316L		AWS ER316L JIS Y316L	0.02	0.39	1.89	18.6	11.8	2.2	570 {58}	40	Welding of low carbon 18%Cr-12%Ni-Mo steel where the corrosion resistant qualities are required.	BV, ABS, DNV, KR,CWB, TÜV	BV, DNV, KR, CWB
	T-316LSi	M-316LSi		AWS ER316LSi JIS Y316LSi	0.02	0.76	1.85	18.7	12.2	2.3	570 {58}	39	Improves the usability of the filler metal. Welding of low carbon 18%Cr-12%Ni-Mo steel.	CWB	CWB, TÜV
	T-317L	M-317L		AWS ER317L JIS Y317L	0.02	0.48	1.09	18.90	13.10	3.40	640 {65}	40	Welding of low carbon 18%Cr-12%Ni-Mo steel (AISI 317L)		
	T-347	M-347		AWS ER347 JIS Y347	0.05	0.46	2.24	19.3	9.3	Cb : 0.6	640 {65}	41	Welding of 18%Cr-9%Ni-Nb steel(AISI Type347), 18%Cr-9%Ni-Ti steels(AISI Type321).		
	–	M-409Cb		AWS ER409Cb	0.01	0.45	0.46	0.23	11.40	Nb+Ta : 0.36	31: 850℃	56	Welding of 13%Cr-Nb steel(AISI Type 409), used on robots within the automotive industry for vehicle exhaust systems.		
	T-410	M-410		AWS ER410 JIS Y410	0.02	0.34	0.39	12.8	–	–	540 {55} 750℃×1hr. S·R	35	Welding of 13%Cr steels(AISI Types 403, 410)		
	T-420	M-420		AWS ER420	0.33	0.41	0.37	12.70	–	–	–	–	Surfacing in requiring corrosion resistance.		
	T-430	M-430		AWS ER430 JIS Y430	0.02	0.33	0.44	16.6	–	–	510 {52} 780℃×1hr. S·R	30	Welding of 17%Cr steel and clad side types 403, 405 clad steels. Welding of dissimilar steels such as Cr-stainless steel to carbon steel.		
	–	M-430LNb		–	0.01	0.49	0.46	18.50	0.20	Nb+Ta : 0.5	48: 850℃	45	Welding of 18%Cr Nb steels (AISI Types 429, 444) used on robots within the automotive industry for vehicle exhayst systems.		
For nickel alloy and copper alloy	KW-T61	KW-M61	TIG ; Dia. : 1.6 - 3.2 Length : 1,000 MIG ; Dia. : 0.8 - 1.6	AWS ERNi-1 JIS YNi-1 KS YNi-1	0.03	0.30	0.30	–	93.0	Ti : 3.0	450 {46}	29	Welding of pure nickel and nickel alloy. Repair welding of cast iron.	ABS	
	KW-T82	KW-M82		AWS ERNiCr-3 JIS YNiCr-3 KS YNiCr-3	0.03	0.05	3.0	19.8	Rem.	Cb: 2.5 Fe : 1.0	640 {65}	36	Welding of Ni-Cr-Fe alloys (Inconel 600 alloy) Welding of carbon steel, stainless steel to Inconel		
	KW-T625	KW-M625		AWS ERNiCrMo-3 JIS YNiCrMo-3 KS YNiCrMo-3	0.02	0.22	0.20	21.5	Rem.	8.6 Fe : 3.70	770 {79}	41	Welding of Ni-Cr-Mo alloys (Hastellyc) Surfacing steel with Ni-Cr-Mo weld metal.		ABS
	KW-T276	KW-M276		AWS ERNiCrMo-4 JIS YNiCrMo-4 KS YNiCrMo-4	0.01	0.06	0.80	15.9	Rem.	16.0 w : 3.6	740 {76}	32	Welding of low carbon Ni-Cr-Mo alloy. Welding of low carbon Ni-Cr-Mo alloy to steel and to other nickel base alloys.		
	KW-T690	KW-M690		AWS ERNiCrFe-7 JIS ERNiCrFe-7	0.016	0.26	0.33	29.7	59.4	Fe : 9.10	690 {70}	40	Welding of Ni-Cr-Fe alloy. (Inconel 690)		
	KW-T60	KW-M60		AWS ERNiCu-7 JIS YNiCu-7 KS YNiCu-7	0.01	0.19	3.44	–	Rem.	Cu : 28.9 Ti : 2.30	510 {52}	30	Welding of Ni-Cu alloys (Monel) Surfacing steel with Ni-Cu alloy weld metal.		
	KW-T617	KW-M617		AWS ERNiCrCoMo-1	0.07	0.30	0.30	22.10	Rem.	8.70 Fe:1.40 Co:11.10	780 {80}	40	Welding of Inconel 617 alloy Dissmilar combinations of High temperature alloys.		
	KW-TCuNi	KW-MCuNi		AWS ERCuNi JIS YCuNi-3 KS YCuNi-3	0.03	0.10	0.80	–	31.0	Ti : 0.4 Cu : Rem.	510 {52}	30	Welding of Cu-Ni alloys. (Cupro Nickel)	ABS	
	KW-TCuNi9	KW-MCuNi9		JIS YCuNi-1 KS YCuNi-1	0.01	0.05	0.9	–	10.5	Cu Rem.	370 {38}	37	Welding of Cu-Ni(90Cu/10Ni)alloys. (Cupro Nickel)		
	–	KW-MCuAl A1		AWS ERCuAl-A1	Cu Rem.	Zn 0.01	Mn 0.30	Fe 0.16	Si 0.06	Al: 8.20 Pb: 0.01	535 {55}	39	Welding of Al-Bronze (Al 8%) Alloy. Surfacing in requring corrosion resistance and wear resistance.		
	–	KW-MCuAl A2		AWS ERCuAl-A2 JIS YCuAl KS YCuAl	Cu Rem.	Zn 0.01	Mn 0.10	Fe 0.85	Si 0.06	Al: 9.20 Pb: 0.01	556 {57}	32	Welding of Al-Bronze (Al 9%) Alloy. Surfacing in requring corrosion resistance and wear resistance.		
	–	KW-MCuAl A3		AWS ERCuSi-A JIS YCuSi-B KS YCuSi-B	Cu Rem.	Zn 0.005	Mn 0.89	Fe 0.05	Si 3.00	Al: 0.005 Pb: 0.005	375 {38}	43	Welding of Silicon (Si 3%) Alloy. Welding of copper-sillicon and copper-zinc base metals, to themselves and also to steel.		

OXYFUEL GAS WELDING CONSUMABLES

Classification	Brand name	Size (mm)	Equivalent specification	Typical chemical composition of rod (%)							Typical mechanical properties of all-weld-metal.		Application	Approvals
				C	Mn	Si	P	S	Cu	Al	T.S N/mm² [kgf/mm²]	El. (%)		
For carbon steel	T-40	Dia ; 1.0~5.0 Length ; 1,000	AWS R45 JIS GA46 KS GA46	0.08	0.45	0.02	0.013	0.010	0.20	0.005	450 {46}	20	Welding of low carbon steel with oxyfuel gas.	

SUBMERGED ARC WELDING CONSUMABLES

Types of fluxes	Brand name	Size (mm)	Equivalent specification	Typical chemical composition of all-weld-metal (%)					
				C	Si	Mn	P	S	Mo
Bonded type	EF-100× KD-50	2.4~6.4	AWS F7A(P)0 – EH14 JIS S502-H KS FS-BN1xYS-S6	0.09	0.45	1.30	0.014	0.012	–
	EF-100H× KD-50	2.4~6.4	AWS F7A(P)2 – EH14 JIS S502-H KS FS-BN1xYS-S6	0.08	0.34	1.34	0.013	0.011	–
	EF-100H× KD-60	2.4~6.4	AWS F8A(P)4 – EA3-G JIS S584-H KS FS-BN1xYS-M5	0.08	0.28	1.27	0.012	0.011	0.48
	EF-200× KD-40	2.4~6.4	AWS F7A(P)4 – EL8 JIS S502-H KS FS-BN1xYS-S1	0.09	0.53	1.25	0.015	0.012	–
	EF-200K× KD-42	2.4~6.4	AWS F7A(P)6 – EM12K JIS S502-H KS FS-BN1xYS-S3	0.09	0.45	1.30	0.014	0.012	–
	EF-200H× KD-60	2.4~6.4	AWS A.23 F8P0-EA3-A3 JIS S572-M	0.08	0.15	1.62	0.013	0.013	0.49
	EF-200H× KD-B2	2.4~6.4	AWS F8P0-EB2-B2 JIS S572-1CM	0.07	0.21	1.75	0.011	0.010	0.44
	EF-100S× KD-42	2.4~6.4	AWS E7A(P)2-EM12K JIS S502-H KS FS-BN1/YS-S3	0.05	0.52	1.63	0.021	0.012	–
	EF-260× KD-60	2.4~6.4	AWS E8A(P)6-EA3-G JIS S584-H KS FS-BN1/YS-M5	0.05	0.13	1.41	0.014	0.012	0.48
Fused type	G-50 × KD-50	2.4~6.4	AWS F7A2-EH14 JIS S502-H KS FS-FG2xYS-S6	0.07	0.33	1.78	0.012	0.011	–
	G-60 × KD-50	2.4~6.4	AWS F7A2-EH14 JIS S502-H KS FS-FG2xYS-S6	0.08	0.41	1.85	0.012	0.011	–

Typical mechanical propertiesm of all-weld-metal				Application	Approvals
Y.P N/mm² [kgf/mm²]	T.S N/mm² [kgf/mm²]	El. (%)	I.V J [kgf · m]		
460 {47}	530 {53}	27	70 {7} (-18℃)	Butt and fillet welding of vessels, LPG tanks and pipes, especially high speed welding of with low current.	ABS, BV, DNV, KR, LR, NK
450 {45}	540 {54}	27	75 {7} (-30℃)	Butt and fillet welding of 490N/mm² class high tensile strength steel.	–
560 {57}	640 {65}	29	50 {5} (-40℃)	Butt and fillet welding of 540N/mm² class high tensile strength steel.	–
450 {45}	550 {55}	27	55 {5} (-40℃)	Butt and fillet welding of general structures such as ships, structual steels and general fabrications. Suitable for single or multi-layer welding of one side or both side of steel plates.	–
460 {46}	560 {56}	28	80 {8} (-50℃)	Butt and fillet welding of vessels, steel structures and general fabrication, espeilly high speed welding with low current.	–
580 {59}	630 {64}	31	70 {7} (-20℃)	Single and multi-layer welding of 590N/mm² class high tensile steel such as steel structures, pipes and machinery	–
550 {56}	620 {63}	27	50 {5} (-20℃)	Single or multi-pass submerged arc welding of 1.25%Cr-1% Mo steel usedfor oil refininig equipment, fossil power equipment, etc.	–
551 {56}	591 {60}	30	70 {7} (-30℃)	welding of vessels, steel stucture and general fabrications.	–
640 {65}	685 {70}	27	80 {8} (-50℃)	single and multi-layer welding of 590N/mm² class high tensile steel such as steel structures, pipes and machinery.	–
420 {43}	540 {53}	27	65 {6} (-30℃)	Butt and fillet welding of general structures such as ships, bridges, machines and other steel structures.	ABS, BV, DNV, KR, LR, NK
430 {43}	530 {53}	27	65 {6} (-30℃)	Butt and fillet welding of general structures such as ships, machines and general fabrication.	ABS, BV, DNV, KR, LR, NK

OXYFUEL GAS WELDING CONSUMABLES

Classification	Brand name	Size (mm)	Equivalent specification	Typical chemical composition of rod (%)						
				C	Mn	Si	P	S	Cu	Al
For carbon steel	T-40	Dia ; 1.0~5.0 Length ; 1,000	AWS R45 JIS GA46 KS GA46	0.08	0.45	0.02	0.013	0.010	0.20	0.005

Typical mechanical properties of all-weld-metal.		Application	Approvals
T.S N/mm² [kgf/mm²]	El. (%)		
450 {46}	20	Welding of low carbon steel with oxyfuel gas.	

COMPARISION TABLE

AWS	JIS	KISWEL	Bohler	ESAB	Hobart	KOBE	Lincoln	Nippon steel
E6019	D4301	KI-101LF				B-10, 14, B-17, BI-14		B-1
	D4303	KT-303				TB-24, 43, IBI-24		A-1
E6010		KCL-10	FOX CEL	Pipeweld 6010	60AP	KOBE-6010	Fleetweld 5P	
E6011	D4311	KCL-11			335A, 335C	KOBE-6011	Fleetweld 35	
E6012		K-6012			12	TB-62	Fleetweld 7	
E6013	D4313	KR-3000	FOX MSU	OK 43.32, 46.00	447A, 447C	RB-26	Fleetweld 37	S-132
E6027	D4327	KF-300LF		OK Femax 39.50		ZERODE 27	Jetweld 2	
E7014		K-7014		OK 46.16	14A		Fleetweld 47	
E7024	D4324	K-7024	FOX HL 180 Ti	OK Femax 33.65	24	ZERODE 50F	Jetweld 1	
E7016	D4316	KH-500LF		OK 53.00	716	LB-26		NITTETSU-16
	D5016	KK-50LF	FOX EV 50-A	OK 53.05		LB-24		EX-55
E7018		K-7018	FOX EV 50-AK	OK 48.00	718	LB-52-18	Jetweld LH70	NITTETSU 7018
E7028	D5026	K-7028LF	FOX HL 180 Kb	OK Femax 38.48	728	LB-52H	Jetweld LH3800	NITTETSU LM55-G
E7048		KH-500VLF		OK Femax 53.35		LB-6V		NITTETSU 16V
E9018-M		K-9018M			HOBALLOY 9018-M			
E10018-M		K-10018M	FOX EV 75		HOBALLOY 10018M			
E11018-M		K-11018M	FOX EV 85		HOBALLOY 11018-M		Jetweld	
E12018-M		K-12018M						
E7010-A1		K-7010A1	FOX CEL Mo	Pipeweld 85			Shield-Arc 85	
E7016-A1	DT1216	K-7016A1				CMA-76		N-0S
E7018-A1		K-7018A1	FOX DMO Kb	OK 74.46	HOBALLOY 7018-A1			
E8016-B1		K-8016B1				CMB 86		
E8016-B2	DT2316	K-8016B2				CMA 98		N-1S
E8018-B2	DT2318	K-8018B2	FOX DCMS Kb		HOBALLOY 8018-B2	CMB-98	Jetweld LH-90MR	
E9016-B3	DT2416	K-9016B3				CMA-106		
E9018-B3	DT2418	K-9018B3	FOX CM 2 Kb		HOBALLOY 9018-B3	CMA 108		
E502-16	DT2516	K-502				CM-5		
E505-16	DT2616	K-505		OK 76.96		CM-9		
E8016-C1	DL5016-6P2	K-8016C1				CM-2		
E8018-C1		K-8018C1	FOX 2.5 Ni	OK 73.68	HOBALLOY 8018-C1		Jet-LH8018-C1MR	
E8016-C2	DL5016-6P3	K-8016C2		OK 73.79				
E8018-C2		K-8018C2		OK 73.78	HOBALLOY 8018-C2			
E8018-C3		K-8018C3	FOX EV 60	OK 73.35	HOBALLOY 8018-C3		Jet-LH8018-C3MR	
E308-16	D308-16	KST-308			Belinox 308-16	NC-38	Stainweld308-16	NITTETSU-308R
E308L-16	D308L-16	KST-308L	FOX EAS 2-TS	OK 61.30	Belinox 308L-16	NC-38L	Stainweld308L-16	NITTETSU-308LR
E309-16	D309-16	KST-309		OK 67.62	Belinox 309-16	NC-39	Stainweld309-16	NITTETSU-309R
E309L-16	D309L-16	KST-309L		OK 67.60	Belinox	NC-39L		NITTETSU-309LR

AWS	JIS	KISWEL	Bohler	ESAB	Hobart	KOBE	Lincoln	Nippon steel
					309L-16			
E310-16	D310-16	KST-310	FOX FFB-A	OK 67.13	Soudocrom 310-16	NC-30	Stainweld 310-16	NITTETSU-310R
E312-16	D312-16	KST-312	FOX CN 29/9	OK 67.81	Soudocrom 312-16	NC-32		
E316-16	D316-16	KST-316			Soudocrom 316-16	NC-36		NITTETSU-316R
E316L-16	D316L-16	KST-316L	FOX EAS 4 M-TS	OK 63.30	Belinox 316-16	NC-36L	Stainweld 316L-16	NITTETSU-316LR
E318-16	D318-16	KST-318		OK 63.30		NC-318		
E347-16	D347-16	KST-347		OK 61.81	Belinox 347-16	NC-37	Stainweld 347-16	NITTETSU-347R
E410-16	D410-16	KST-410		OK 68.12		CR-40		
E430-16	D430-16	KST-430				CR-43		
	DF2A-250	KM-100		OK 83.28	Tufanhard 250	HF-240	Jet LH BU-90	H-250B
	DF2A-300	KM-300				HF-330		H-300C
	DF2B-450	KM-500				HF-500		H-500
	DF4B	KM-11Cr		OK 84.58	Cromecoat			H-13Cr
	DFMA	KM-900		OK 86.08	Cro-Nimang	HF-11	MANGJET	H-13M
ENi-Cl	DFCNNi	KSN-100		OK 92.18	Cast-Tex 99	CIA-1	Softweld 99 Ni	C-1N
ENiFe-Cl	DFCNiFe	KFN-50		OK 92.58	Cast-Tex 55	CIA-2	Softweld 55 Ni	C-5N
ER70S-3		KC-25			HB-25	MIX-50	LNT/LNM 25	YM-25
ER70S-6		KC-28	EMK 6	OK Autorod 12.51	Hb-28	MG-51T	LNM 26	YM-28
ER70S-G		KC-26				MG-50		YM-26
E71T-1	YFW-C50DR	K-71T		OK Tubrod 15.13	FabCo 825	DW-100	Outershield 71-H	SF-1
E71T-1/1M	YFW-C502R	K-71TLF	Ti-52-FD	OK Tubrod 15.15		MX-100T		SF-1A
E70T-1	YFW-C50DM	KX-200		OK Tubrod 15.12	FabCo 90	MX-200	Outershield 70	SM-1
	YFW-C502R	K-70ST				DW-200		
E71T-5/5M	YFW-C502B	K-71TB		OK Tubrod 15.00	FabCo 85	DWA-51B	Outershield T55-H	SF-36
E70C-6M	YFW-A502M	KX-706M						
E71T-1/9J	YFL-C504R	K-71UT		OK Tubrod 15.13S	Excel-ARC 71	DW-55E		
E71T-12J	YFL-C504R	K-71TSR			Formula XL-550	DW-55ESR		
E81T1-K2	YFL-C506R	K-81TK2			FabCOR 81K2-C	DW-55L	Outershield 81K2-H	
E81T1-B2	YF1CM-C	K-81TB2					Outershield 81B2-H	
E110T1-K3		K-110TK3						
E308T0-1/4	YF308C	K-308T				DW-308		SF-308
E308LT1-1/4	YF308LC	K-308LT	EAS 2 PW-FD	OK Tubrod 14.30		DW-308LP	Cor-A-Rosta 304L	SF-308LP
E309T0-1/4	YF309C	K-309T				DW-309		
E309LT1-1/4	YF309LC	K-309LT	CN 23/12 PW-FD	OK Tubrod 14.32		DW-309LP	Cor-A-Rosta 309L	SF-309LP
E316T0-1/4	YF316C	K-316T				DW-316		
E316LT1-1/4	YF316LC	K-316LT	EAS 4 PW-FD	OK Tubrod 14.31		DW-316LP	Cor-A-Rosta 316L	SF-316LP
E2209T1-1/4		K-329T	CN 22/9 PW-FD	OK Tubrod 14.37		DW-329A		
EC409		K-409TiT			FabCOR 409			
ER308	Y308	M-308			308	MGS-308	Lincolnweld L 18/8	YM-308
ER308L	Y308L	M-308L	EAS 2-IG	OK Autorod 16.10	308L		LNT/LNM 304L	YM-308L
ER308LSi	Y308LSi	M-308LSi	EAS 2-IG (Si)	OK Autorod 16.12	308L-Si	MGS-308LS	LNT/LNM 304LSi	
ER309	Y309	M-309	FA-IG		309	MGS-309		YM-309
ER309L	Y309L	M-309L	CN 23/12 PW-FD	OK Autorod 16.53	309L		LNT/LNM 309 LHF	
ER316	Y316	M-316		OK Autorod 16.35				YM-316
ER316L	Y316L	M-316L	EAS 4 M-IG	OK Autorod 16.30	316L		LNT/LNM 316L	YM-316L

Approvals

Brand name	KS	AWS	KR		ABS		LR	
			Grade	Welding positions	Grade	Welding positions	Grade	Welding positions
KI-101LF	E4301	E6019	RMW3	All, H-Fil, F	3	All, F	3m	All
KT-303	E4303	–	RMW3	All	3, D4303	All, F	3m	All
KCL-10	E4311	E6010	–	–	3, E6010	All, F	3m	All
KCL-11	E4311	E6011	–	–	3, E6011	All, F	3m	All
KR-3000	E4313	E6013	RMW2	All, H-Fil, F	2	All, F	2m	All
KR-3000V	E4313	E6013	–	–	2	All,V-down	2m	All, V-down
KH-500LF	E4316	E7016	RMW3H	All, H-Fil, F	3H10, 3Y	All, F	3m,3Ym,H15	All
KH-500VLF	E4316	E7048	RMW53H RMW3H	F, H, V-down	3H10, 3Y	All,V-down	3m,3Ym,H15	All, V-down
KH-500W	E4316	E7016	–	–	3H10, 3Y	All	–	–
KH-500T	E4316	E7016	–	–	3H10, 3Y	All,V-down	3m,3Ym,H15	All, V-down
KF-300LF	E4327	E6027	RMW3	Flat, H-Fil	3	Flat	3m	Flat
K-7014	–	E7014	RMW52	All, H-Fil, F	2Y, E7014	All, F	2m,2Ym	All
K-7024	E4324	E07024	RMW53	All, H-Fil, F	2Y, E7024	Flat	2m,2Ym	Flat
KK-50LF	D5016	E7016	RMW53H	All, H-Fil, F	3H10, 3Y	All, F	3m,3Ym,H15	All
K-7018	D5016	E7018	RMW53H	All, H-Fil, F	3H10, 3Y, E7018	All, F	3m,3Ym,H15	All
K-7028LF	D5026	E7028	RMW53HH	Flat, H-Fil	3H10, 3Y	Flat	3m,3Ym,H15	Flat
K-8018	D5316	E8018-G	–	–	3, 3Y	All,V-down	–	–
K-7010A1	–	E7010-A1	–	–	3Y, E7010-A1	All, F	–	–
K-8018B2	DT2318	E8018-B2	–	–	3H10, 3Y, E8010-B2	All, F	3m,3Ym,H15	All
K-8018C1	–	E8018-C1	–	–	3H10, 3Y, E8018-C1	All, F	3m,3Ym,H15	All
K-8018C3	–	E8018-C3	–	–	3H10, 3Y, E8018-C3	All, F	3m,3Ym,H15	All
KK-50N	DL5016-4A0	E7016-G	–	–	–	–	5Y40m,H15	All
K-7018N	–	E7018-1	–	–	–	–	5Y40m,H15	All
KST-308	D308-16	E308-16	RD308	All, H-Fil, F	A5.4-92, E308-16	All, F	–	–
KST-308L	D308L-16	E308L-16	–	–	A5.4-92, E308L-16	All, F	304L m	F, H, V-up
KST-309	D309-16	E309-16	RD309	All, H-Fil, F	A5.4-92, E309-16	All, F	SS/CMn	F, H, V-up
KST-309L	D309L-16	E309L-16	–	–	A5.4-92, E309L-16	All, F	–	–
KST-309Mo	D309Mo-16	E309Mo-16	–	–	–	–	–	–
KST-309MoL	D309MoL-16	E309MoL-16	RD309MoL	D, V, H	–	–	–	–
KST-310	D310-16	E310-16	–	–	–	–	–	–
KST-316	D316-16	E316-16	–	–	A5.4-92, E316-16	All, F	–	–
KST-316L	D-316L-16	E316L-16	RD316L	All, H-Fil, F	A5.4-92, E316L-16	All, F	316L m	F, H, V-up
KC-25(100%CO_2)	YGW14	ER70S-3	RSW53G (C1)	All	3SA, ER70S-3	Flat, V	3S,3YS,H15	All,V-down
KC-26(100%CO_2)	YGW11	ER70S-G	RSW53G (C1)	All	3YSA	All, V-down, F	3S,3YS,H15	All,V-down
			RAW53MG (C1)	Downhand				

DNV		NK		BV		GL		CCS		RINA		CWB	TÜV	KS	JIS
Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions				
3	All	KMW3	All	3	All	3	All	–	–	–	–			○	○
3	All	KMW3	All	–	–	3	All	–	–	–	–			○	○
–	–	KMW3	All	3	All	–	–	–	–	–	–	○★			○
3	All	–	–	–	–	–	–	–	–	–	–	○★			○
2	All	KMW2	All	2	All	2	All	–	–	–	–	○★		○	○
–	–	–	–	2	All, V-down	–	–	–	–	–	–			○	○
3YH10	All	KMW3H	All	3YHH	All	3H10	All	–	–	–	–			○	○
3YH10	All, V-down	KMW3H	All, V-down	3YHH	All, V-down	–	–	–	–	–	–			○	○
3YH10	All	–	–	–	–	–	–	–	–	–	–			○	○
–	–	KMW53HH	All, V-down	–	–	–	–	–	–	–	–			○	○
3	Falt, H-Fil	KMW3	Flat, H-Fil	3	Flat, H-Fil	3	Flat, H	–	–	–	–			○	○
–	–	KMW52	All	–	–	–	–	–	–	–	–	○★			○
3	Flat	KMW52	Flat	2Y	Flat, H-Fil	2Y	Flat, H	–	–	–	–	○★			○
3YH10	All	KMW53H	All	3YHH	All	3YH10	All	–	–	–	–			○	○
3YH10	All	KMW53H	All	3YHH	All	3YH10	All	–	–	–	–	○		○	○
3YH10	Flat, H-Fil	KMW53HH	Flat, H-Fil	3YHH	Flat, H-Fil	3YH10	Flat, H	–	–	–	–				○
–	–	–	–	–	–	–	–	–	–	–	–				○
–	–	–	–	–	–	–	–	–	–	–	–				
3YH15	All	–	–	–	–	–	–	–	–	–	–				
3YH15	All	–	–	–	–	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–				
5YH10	All/NV2(4)-4L	–	–	–	–	–	–	–	–	–	–				
5YH10	All/NV2(4)-4L	–	–	–	–	–	–	–	–	–	–	○★			
308	All	–	–	UP	All	4306	All	–	–	–	–	○★			
–	–	–	–	UP	All	4306	All	–	–	–	–	○★	○		
309	All	–	–	UP	All	4332	All	–	–	–	–	○★			
–	–	–	–	–	–	–	–	–	–	–	–	○★			
309Mo	All	–	–	–	–	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–	○★			
–	–	–	–	UP	All	4435	All	–	–	–	–	○★			
316L	All	–	–	UP	All	4435	All	–	–	–	–	○★	○		
Ⅲ YMS	All, V-down	kSW 53G(C)	All	–	–	–	–	–	–	–	–	○★		○	○
Ⅲ YMS	All, V-down	kSW 53G(C)	All	SA3YM	All, V-down	3YS	F, H, V-up, V-down	–	–	–	–			○	○
														○	○

Approvals

Brand name	KS	AWS	KR		ABS		LR	
			Grade	Welding positions	Grade	Welding positions	Grade	Welding positions
KC-26(Ar+20%CO_2)	YGW11	ER70S-G	–	–	–	–	–	–
KC-27(Ar+20%CO_2)	YGW15	ER70S-G	–	–	3YSA	All, V-down	–	–
KC-28(100%CO_2)	YGW12	ER70S-6	RSW53G (C1)	All	3SA, ER70S-6	Flat, V, V-down	3S, 3YS, H15	All, V-down
KC-28(Ar+20%CO_2)	YGW12	ER70S-6	–	–	3SA, 3YSA	All, V-down	–	–
ZO-26(100%CO_2)	YGW11	ER70S-G	RSW53G (C1)	D,H,V-up,V-down	3SA, 3YSA	All, V-down	3S, 3YS, H15	F,H,V-up,V-down
ZO-27(Ar+20%CO_2)	YGW15	ER70S-G	–	–	3SA, 3YSA	All, V-down	3S, 3YS, H15	F,H,V-up,V-down
ZO-28(100%CO_2)	YGW12	ER70S-6	–	–	3SA, 3YSA	All, V-down	3S, 3YS, H15	F,H,V-up,V-down
ZO-28(Ar+25%CO_2)	YGW12	ER70S-6	RAW53MG(M21)	Downhand	3A, 3YA	Flat	3M, 3YM, H15	Downhand
ZO-60(100%CO_2)	YGW21	ER80S-G	–	–	–	–	–	–
ZO-60/K-CM/DB-1-4	–	–	–	–	2A,2YA	Flat	–	–
T-50	YGT-50	ER70S-6	–	–	2YSA	All	–	–
T-308L	Y308L	ER308L	RY308LG(I)	All	–	–	304L	All
T-308LSi	Y308LSi	ER308LSi	–	–	–	–	–	–
T-309L	Y309L	ER309L	RY309LG(I)	All	–	–	SS/CMn	F, H, V-up, OH
T-316L	Y316L	ER316L	RY316LG(I)	D,H,V-up	A5.9-93,ER316L	All, V-down	316L	F,H,V-up,V-down
KW-T61	YNi-1	ERNi-1	–	–	AWS A5.14-97 ERNi-1	All	–	–
KW-TCuNi	YCuNi-3	ERCuNi	–	–	AWS A5.7-84R ERCuNi	All	–	–
M-308LSi	Y308LSi	ER308LSi	–	–	–	–	–	–
M-309	Y-309	ER309	–	–	–	–	–	–
M-316L	Y316L	ER316L	RY316LG(M1)	D,H	–	–	–	–
M-316LSi	Y316LSi	ER316LSi	–	–	–	–	–	–
KW-M625	ERNiCrMo-3	ERNiCrMo-3	–	–	A5.14-89,ERNiCrMo-3	All	3M,3YM,3YT	–
KD-40/EF-200	S502-H	F7A(P)4/EL8	RAW53TM	Flat	3TM, 3YTM	Flat	3M,3YM,3YT	Downhand
KD-42/EF-200K	S502-H	F7A(P)6/EM12K	RAW53TM	Flat	3TM, 3YTM	Flat	3M,3YM,3YT	Downhand
KD-50/EF-100	S502-H	F7A(P)2/EH14	RAW53TM	Flat	3TM, 3YTM	Flat	3M,3YM,3YT	Downhand
KD-50/EF-100H	S502-H	F7A(P)2/EH14	RAW53TM	Flat	3TM, 3YTM	Flat	–	Downhand
K-40/K-CM EF-200/DB-1-1	–	–	RAW52SR	Flat	2A, 2YA	Flat	2S,2YS,H15	–
K-71T(100%CO_2)	YFW-C50DR	E71T-1	RSW52G	All,V-down	2SA, 2YSA, H10	All, V-down	–	All, V-down
K-71T(Ar+20%CO_2)	YFW-A50DR	E71T-1M	–	–	–	–	2S,2YS,H15	–
K-71T/CBM-8061	–	–	RAW52MRG(C1)H	F,H,V-up,V-down	2SA, 2YSA, H15	F, H, V, V-down	3S,3YS,H10	F,H,V-up,V-down
K-71TLF(100%CO_2)	YFW-C50DR	E71T-1	RSW53G(C1)HH	All,V-down	3SA, 3YSA, H10	All, V-down	3S,3YS	All, V-down
K-71TLF(Ar+20%CO_2)	YFW-A50DR	E71T-1M	–	–	3SA, 3YSA, E71T-1M	All, V-down	–	All, V-down
K-71TM(100%CO_2)	YFW-C50DR	E71T-1	–	–	2SA, 2YSA, E71T-1/1M	All, V-down	3S,3YS	–
K-71TM(Ar+20%CO_2)	YFW-A50DR	E71T-1M	–	–	3SA, 3YSA	All, V-down	–	All, V-down
K-70T(100%CO_2)	YFW-C50DM	E70T-1	–	–	–	–	–	–
K-70T(Ar+20%CO_2)	YFW-A50DM	E70T-1M	–	–	–	–	3S,3YS	–
K-70ST(100%CO_2)	YFW-C50DR	E70T-1	RSW53G(C1)	Flat	3SA, 3YSA, E70T-1/1M	Flat	3S,3YS,H10	Downhand
K-70LB(100%CO_2)	YFW-C50DR	E70T-1	RSW53G(C1)HH	Falt	3SA, 3YSA, H10	Flat		Downhand

DNV		NK		BV		GL		CCS		RINA		CWB	TÜV	KS	JIS
Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions				
–	–	KSW53G(M2)	F,H,V-up,V-down	–	–	–	–	–	–	–	–			○	○
‖ YMS	All,V-down	KSW53G(M2)	F,H,V-up,V-down	–	–	–	–	–	–	–	–	○★	○	○	○
‖ YMS	All,V-down	KSW53G(C)	All	SA3YM	All,V-down	3YS	All,V-down	3S,3YS	All,V-down	–	–		○	○	○
–	–	–	–	–	–	–	–	–	–	–	–			○	○
‖ YMS	All,V-down	KSW53G(C)	F,H,V-up,V-down	SA3YM	All,V-down	3YS	All,V-down	–	–	–	–			○	○
‖ YMS	All,V-down	KSW53G(M2)	F,H,V-up,V-down	–	–	–	–	–	–	–	–				○
–	–	KSW53G(C)	F,H,V-up,V-down	–	–	–	–	–	–	–	–			○	○
‖ YM	Flat,H-Fil	KAW53MG(M2)	Flat	A3TM	Flat	3YS	F,H	–	–	–	–			○	○
–	–	KSW3Y46G(C)	F,H,V-up,V-down	–	–	–	–	–	–	–	–				○
‖ Y	Flat	KAW52SPG(C)	Flat	–	–	–	–	–	–	–	–				○
–	–	–	–	–	–	–	–	–	–	–	–				
308LM	All,V-down	–	–	UP	All	–	–	–	–	–	–		○		
–	–	–	–	–	–	–	–	–	–	–	–	○★			
309LM	All,V-down	–	–	UP	All	–	–	–	–	–	–				
316LM	All,V-down	–	–	UP	All	–	–	–	–	–	–		○		
–	–	–	–	–	–	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–	○★	○		
–	–	–	–	UP	Flat,H-Fil	–	–	–	–	–	–				
–	–	–	–	UP	Flat,H-Fil	–	–	–	–	–	–				
316LMS	All,V-down	–	–	UP	Flat,H-Fil	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–		○		
–	–	–	–	–	–	–	–	–	–	–	–				
‖ YTM	Flat	KAW53TM	Flat	A3TM,A3YTM	Downhand	3YTM	F	–	–	–	–				
‖ YTM	Flat	KAW53TM	Flat	A3TM,A3YTM	Downhand	3YTM	F	–	–	–	–				
‖ YTM	Flat	KAW53TM	Flat	A3TM,A3YTM	Downhand	3YTM	F	–	–	–	–				
‖ YTM	Flat	KAW53TM	Flat	3TM,3YTM	Downhand	3YM	F	–	–	–	–				
‖ Y	Flat	–	–	–	–	2YM	F	–	–	–	–				
‖ YMS	All,V-down	KSW52G(C)	All,V-down	SA2YM	All,V-down	2YH15S	All,V-down	3S,3YS	All,V-down	2YSHH	All,V-down	○		○	○
–	–	–	–	–	–	–	–	–	–	–	–	○★		○	○
‖ YMS(H15)	F,H,V,V-down	KAW52MPG(C)H15	F,H,V-up,V-down	SA2YMH	F,H,V-up,V-down	2YH15S	F,H,V-up,V-down	–	–	–	–			○	○
‖ YMS(H10)	All,V-down	KSW53G(C)H10	All,V-down	3S,3YS,H10	All,V-down	3YH10S	All,V-dwon	3S3YS,H10	All,V-down	3YS	All,V-down		○	○	○
‖ YMS	All,V-down	–	–	3Y,3YS	All,V-down	3YS	All,V-dwon	–	–	–	–		○	○	○
–	–	–	–	–	–	–	–	–	–	–	–			○	○
‖ YMS	All,V-down	–	–	SA3YM	All,V-down	–	–	–	–	3YSHH	All,V-down		○	○	○
–	–	–	–	–	–	–	–	–	–	–	–	○★		○	○
–	–	–	–	–	–	–	–	–	–	–	–	○★		○	○
‖ YMS	Flat,H-Fil	KSW53G(C)	Flat	3S,3YS	Flat,H-Fil	3YS	Flat,H	–	–	–	–			○	○
‖ YMS(H10)	Flat,H-Fil	–	–	–	–	3YH10S	Flat,H	–	–	–	–			○	○

Approvals

Brand name	KS	AWS	KR		ABS		LR	
			Grade	Welding positions	Grade	Welding positions	Grade	Welding positions
KX-100(100%CO_2)	YFW-C50DM	E70C-3C	RSW53G(C1)	Flat	2SA,2YSA	Flat	3S,3YS	Downhand
KX-200(100%CO_2)	YFW-C50DM	E70T-1	RSW53G(C1)	Flat	2SA,2YA,H10	Flat	2S,2YS	Downhand
			RAW53MG(C1)	Flat	3A,3YA,E70T-1	Flat	3M,3YM	Downhand
KX-200(Ar+20%CO_2)	YFW-A50DM	E70T-1M	–	–	–	–	–	–
KX-200H(100%CO_2)	YFW-C50DM	E70T-1	RSW53G(C1)HHH	F,H	3SA,3YSA,H5,E70T-1	F,H	3S,3YS,H10	F,H
			RAW53MG(C1)	Flat	3A,3YA,E70T-1	Flat	3M,3YM,H10	Downhand
KX-70CM(Ar+20%CO_2)	YFW-A50DM	E70C-3M	–	–	2SA,2YSA	Flat	2S,2YS	Downhand
KX-706M(100%CO_2)	YFW-C502M	E70C-6C	–	–	3SA,3YSA	Flat	3S,SYS	Downhand
KX-706M(Ar+20%CO_2)	YFW-A502M	E70C-6M	–	–	3SA,3YSA	Flat	3S,3YS	Downhand
KX-706M(Ar+2%CO_2)	YFW-A502M	E70C-6M	–	–	–	–	–	–
K-NGS	YFW-S50GB	E71T-GS	–	–	–	–	–	–
K-81T(100%CO_2)	YFW-C602R	E81T1-Ni1	RSW54G(C1)HHH	All,V-down	3SA,4YSA,H5	All,V-down	4YS,H5	All,V-down
K-110TK3(100%CO_2)	–	E110T1-K3	–	–	E110T1-K3,H5	All,V-down	–	–
K-71UT(100%CO_2)	YFL-C504R	E71T-1/9J	RSW54G(C1)HHH	All,V-down	3SA,4YSA,H5	All,V-down	4YS, H10	All,V-down
K-71TSR(100%CO_2)	YFL-504R	E71T-12J	RSW54G(C1)HHH	All,V-down	3SA,4YSA,H5	All,V-down	4YS,H5	All,V-down
K-80TK2(100%CO_2)	YFL-C506M	E80T1-K2	RSWL3G(C1)HHH	Flat	4YSA,4Y400SA,H5**47J/-60℃	Flat	5Y40S, H10	Downhand
			RAWL3MG(C1)HHH	Flat	4YA,4Y400A,H5**41J/-60℃	Flat	5Y40M, H10	Downhand
K-81TK2(100%CO_2)	YFL-C506R	E81T1-K2	RSWL3G(C1)HHH	All,V-down	4YSA,400SA,H5**47J/-60℃	All,V-down	5Y40S, H5	All,V-down
K-81TK2/CBM-8061	–	–	RAW53MR(C1)H	F,H,V-up.V-down	3SA,3YSA,H15	F,H,V,V-down	3S,3YS,H15	F,H,V-up,V-down
K-308T(100%CO_2)	YF308C	E308T0-1	RW308G	All	E308T1-1	All	–	–
K-308LT(100%CO_2)	YF308LC	E308LT1-1	RW308LG	All	E308LT1-1	All	–	–
K-308LT(Ar+20%CO_2)	YF308LC	E308LT1-4	–	–	–	–	–	–
K-309T(100%CO_2)	YF309C	E309T0-1	RW309G	All	E309T1-1	All	SS/CMnS	F,V-up,OH
K-309LT(100%CO_2)	YF309LC	E309LT1-1	RW309LG	All	E309LT1-1	All	SS/CMnS	All,V-down
K-309LT(Ar+20%CO_2)	YF309LC	E309LT1-4	–	–	–	–	–	–
K-309MoLT(100%CO_2)	YF309MoLC	E309LMoT1-1	RW309MOLG (C1)	Downhand	–	–	–	–
K-316T(100%CO_2)	YF316C	E316T0-1	RW316G	All	E316T1-1	All	–	–
K-316LT(100%CO_2)	YF316LC	E316LT1-1	RW316LG	All	E316LT1-1	All	–	–
K-316LT(Ar+20%CO_2)	YF316LC	E316LT1-4	–	–	–	–	–	–
K-317LT(100%CO_2)	YF317LC	E317LT1-1	–	–	E317LT1-1	Flat	–	–
K-329T(100%CO_2)	–	E2209T1-1	–	–	A5.22-95,E2209T1-1	All	–	–
K-409TiT(Ar+2%CO_2)	–	EC409	–	–	E409T0-G	Flat	–	–

DNV		NK		BV		GL		CCS		RINA		CWB	TÜV	KS	JIS
Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions	Grade	Welding positions				
Ⅲ YMS	Flat,H-Fil	KSW53G(C)	Flat	SA3YM	Flat	3YS	F	–	–	–	–			○	○
Ⅱ YMS	Flat	KSW53G(C)	Flat	SA2YM	Flat	3YS	F	3S,3YS	Flat	–	–		○	○	○
Ⅲ YM	Flat	KAW53MG(C)	Flat	3M,3YM	Flat	3YM	F	–	–	–	–		○	○	○
–	–	–	–	–	–	–	–	–	–	–	–		○	○	○
Ⅱ YMS(H5)	F,H,H-Fil	–	–	–	–	3YH5S	F,H	–	–	–	–			○	○
Ⅲ YM	Flat	–	–	–	–	3YM	F	–	–	–	–			○	○
Ⅱ YMS	Flat,H-Fil	–	–	SA2,SA2Y	Downhand	2YS	Flat,H	–	–	2YS	F,H-Fil			○	○
Ⅲ YMS	Flat,H-Fil	–	–	SA3,SA3Y	Downhand	3YS	Flat,H	–	–	3YS	F,H-Fil			○	○
Ⅲ YMS	Flat,H-Fil	–	–	3S,3YS	Downhand	3YS	Flat,H	–	–	–	–	○		○	○
–	–	–	–	–	–	–	–	–	–	–	–	○		○	○
–	–	–	–	–	–	–	–	–	–	–	–	○		○	○
IVYM(H5)	All,V-down	KSW54G(C)H5	All,V-down	4YS,H5	All,V-down	4YH5S	All,V-down	–	–	–	–			○	○
–	–	–	–	–	–	–	–	–	–	–	–	○			
IVYMS(H5)	All,V-down	KSW54G(C)H5	All,V-down	4S,4YS,H5	All,V-down	4YH5S	All,V-down	–	–	–	–			○	○
IVYMS(H5)	All,V-down	KSW54G(C)H5	All,V-down	4YS,H5	All,V-down	4YH5S	All,V-down	–	–	–	–			○	○
IVY40MSH5, -60℃	Flat	KSWL3G(C)H5	Flat	5Y40S,H5	Flat	6Y40H5S	F	–	–	–	–			○	○
IVY40MH5, -60℃	Flat,H-Fil	–	–	5Y40M,H5	Flat	–	–	–	–	–	–			○	○
IVY40MS(H5), -60℃	All,V-down	KSWL3G(C)H5	All,V-down	5Y40S,H5	All,V-down	6Y40H5S	All,V-down	–	–	–	–			○	○
Ⅲ YMS(H15)	F, H,V,V-down	KAW53MPG(C)H15	F,H,V-up,V-down	SA3YMH	F,H,V-up,V-down	3YH15S	F,H,V-up,V-down	–	–	–	–			○	○
308MS	All	KW308G(C)	F,H,V-up,V-down	UP	All	–	–	–	–	–	–				○
–	–	KW308LG(C)	All	UP	All	–	–	–	–	–	–	○	○		○
–	–	–	–	–	-	–	–	–	–	–	–	○	○		○
309MS	All	KW309G(C)	F,H,V-up,V-down	UP	All	–	–	–	–	–	–				○
309LMS	All,V-down	KW309LG(C)	All	UP	All	–	–	–	–	309LS	All,V-down	○	○		○
–	–	–	–	–	–	–	–	–	–	–	–	○	○		○
–	–	–	–	–	–	–	–	–	–	–	–				○
–	–	–	–	–	–	–	–	–	–	–	–				○
316LMS	All,V-down	KW316LG(C)	All	UP	F,H,V-up	–	–	–	–	316LS	All,V-down	○★	○		○
–	–	–	–	–	–	–	–	–	–	–	–	○	○		○
–	–	–	–	–	–	–	–	–	–	–	–				○
–	–	–	–	–	–	–	–	–	–	–	–				
–	–	–	–	–	–	–	–	–	–	–	–				

Remarks.

1. The abbreviations indicate the approval as follows;
   ABS : American Bureau of Shipping BV : Bureau Veritas CCS : China Classification Society CWB : Canadian Welding Bureau
   DNV: Det Norske Veritas GL : Germanischer Lloyd KR : Korean Register of Shipping LR : Lloyd's Register of Shipping NK : Nippon Kaiji Kyokai
   TÜV: Technischen Überwachungs-Vereine
2. The abbreviations indicate the welding position as follows;
   F : Flat H : Horizontal H-Fil : Horizontal fillet OH : Overhead V : Vertical VD : Vertical down
3. ★imdicate marketing approvals from the marketing companies.

CAUTION

Welding may produce fumes and gases hazardous to health.
Avoid breathing these fumes and gases, use the adequate ventilation.
The arc is harmful to skin and eyes and please use adequate protection equipment.
Attention for electric shock and don't touch to the electric parts.

CAUTIONS FOR CUSTOMER

- The general data shown on this catalogues of welding consumables, weld metals, is to explain the representive characteristics, not guarantee it except of the on shown of specification.
- The welding efficiency is depend on the chemical compositions of base metal and welding conditions, the experinces of welder, etc.
- The loss caused by misunderstanding and using of the technical information shown on this catalogues is up to user.