

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/mm ² [kgf/mm ²]	EI. (%)		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.	–	–

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	TIG	MIG			C	Si	Mn	Cr	Ni	Mo
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
	-	M-307LSi		EN 12072 G188Mn	0.07	0.8	7.1	18.0	8.0	-
	T-308	M-308		AWS ER308 JIS Y308	0.04	0.38	1.90	19.8	9.8	-
	T-308L	M-308L		AWS ER308L JIS Y308L	0.02	0.38	1.90	19.8	9.8	-
	T-308H	M-308H		AWS ER308H	0.05	0.42	2.06	19.90	9.70	-
	T-308LSi	M-308LSi		AWS ER308LSi JIS Y308LSi	0.02	0.75	1.95	19.7	10.4	-
	T-309	M-309		AWS ER309 JIS Y309	0.05	0.36	1.84	23.6	13.3	-
	T-309L	M-309L		AWS ER309L JIS Y309L	0.01	0.40	1.92	23.2	13.8	-
	T-309LSi	M-309LSi		AWS ER309LSi JIS Y309LSi	0.02	0.75	2.28	23.2	13.7	-
	T-309LMo	M-309LMo		EN 12072 G 2312SL	0.02	0.45	1.45	14.50	21.40	2.61
	T-310	M-310		AWS ER310 JIS Y310	0.10	0.10	1.73	26.6	20.9	-
	T-312	M-312		AWS ER312 JIS Y312	0.10	0.43	1.72	8.70	30.4	-
	T-316	M-316		AWS ER316 JIS Y316	0.04	0.40	1.62	19.1	12.1	2.3
	T-316L	M-316L		AWS ER316L JIS Y316L	0.02	0.39	1.89	18.6	11.8	2.2
	T-316LSi	M-316LSi		AWS ER316LSi JIS Y316LSi	0.02	0.76	1.85	18.7	12.2	2.3
	T-317L	M-317L		AWS ER317L JIS Y317L	0.02	0.48	1.09	18.90	13.10	3.40
	T-347	M-347		AWS ER347 JIS Y347	0.05	0.46	2.24	19.3	9.3	Cb : 0.6
	-	M-409Cb		AWS ER409Cb	0.01	0.45	0.46	0.23	11.40	Nb+Ta : 0.36
	T-410	M-410		AWS ER410 JIS Y410	0.02	0.34	0.39	12.8	-	-
	T-420	M-420		AWS ER420	0.33	0.41	0.37	12.70	-	-
T-430	M-430	AWS ER430 JIS Y430	0.02	0.33	0.44	16.6	-	-		
-	M-430LNb	-	0.01	0.49	0.46	18.50	0.20	Nb+Ta : 0.5		
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 JIS KS ERNi-1 YNi-1	0.03	0.30	0.30	-	93.0	Ti : 3.0
	KW-T82	KW-M82		AWS JIS KS ERNiCr-3 YNiCr-3	0.03	0.05	3.0	19.8	Rem.	Cb: 2.5 Fe : 1.0
	KW-T625	KW-M625		AWS JIS KS ERNiCrMo-3 YNiCrMo-3	0.02	0.22	0.20	21.5	Rem.	8.6 Fe : 3.70
	KW-T276	KW-M276		AWS JIS KS ERNiCrMo-4 YNiCrMo-4	0.01	0.06	0.80	15.9	Rem.	16.0 w : 3.6
	KW-T690	KW-M690		AWS JIS KS ERNiCrFe-7 ERNiCrFe-7	0.016	0.26	0.33	29.7	59.4	Fe : 9.10
	KW-T60	KW-M60		AWS JIS KS ERNiCu-7 YNiCu-7	0.01	0.19	3.44	-	Rem.	Cu : 28.9 Ti : 2.30
	KW-T617	KW-M617		AWS ERNiCrCoMo-1	0.07	0.30	0.30	22.10	Rem.	8.70 Fe:1.40 Co:11.10
	KW-TCuNi	KW-MCuNi		AWS JIS KS ERNiCuNi-3 YCuNi-3	0.03	0.10	0.80	-	31.0	Ti : 0.4 Cu : Rem.
	KW-TCuNi9	KW-MCuNi9		JIS KS YCuNi-1 YCuNi-1	0.01	0.05	0.9	-	10.5	Cu Rem.
	-	KW-MCuAl A1		AWS ERNiCuAl-1	Cu Rem. Zn 0.01 Mn 0.30 Fe 0.16 Si 0.06	Al: 8.20 Pb: 0.01				
	-	KW-MCuAl A2		AWS JIS KS ERNiCuAl-2 YCuAl	Cu Rem. Zn 0.01 Mn 0.10 Fe 0.85 Si 0.06	Al: 9.20 Pb: 0.01				
	-	KW-MCuAl A3		AWS JIS KS ERNiCuSi-A YCuSi-B YCuSi-B	Cu Rem. Zn 0.005 Mn 0.89 Fe 0.05 Si 3.00	Al: 0.005 Pb: 0.005				

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 JIS KS R45 GA46 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/mm ² {kgf/mm ² }	El. (%)		TIG	MIG
840 {86}	28	Welding of 22%Cr-9%Ni-3%Mo (UNS S31803, S32900) steels.		
610 {62}	40	Welding of dissimilar steel such as austenitic manganese steel to carbon steel forgings.		
610 {62}	42	Welding of AISI Types 301, 302, 304 and 308.		
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
590 {60}	42	Welding of high carbon 18%Cr-8%Ni steel (AISI 304H)		
590 {60}	42	Improves the usability of the filler metal, welding of low carbon 18%Cr-8%Ni steels.	CWB	CWB, TÜV
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
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
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.		
660 {67}	33	Subtable for dissimilar metal joint and underlaying on ferritic steels for overlaying stainless steel weld metals.		
600 {61}	40	Welding of similar composition base metals .		
730 {75}	30	Welding of cast alloys of similar composition. Welding of dissimilar metals such as carbon steel to stainless steel.		
580 {59}	38	Welding of 18%Cr-12%Ni-Mo steel.(AISI Type 316)		
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
570 {58}	39	Improves the usability of the filler metal. Welding of low carbon 18%Cr-12%Ni-Mo steel.	CWB	CWB, TÜV
640 {65}	40	Welding of low carbon 18%Cr-12%Ni-Mo steel (AISI 317L)		
640 {65}	41	Welding of 18%Cr-9%Ni-Nb steel(AISI Type347), 18%Cr-9%Ni-Ti steels(AISI Type321).		
31: 850°C	56	Welding of 13%Cr-Nb steel(AISI Type 409), used on robots within the automotive industry for vehicle exhaust systems.		
540 {55}	35	Welding of 13%Cr steels(AISI Types 403, 410)		
-	-	Surfacing in requiring corrosion resistance.		
510 {52}	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.		
48: 850°C	45	Welding of 18%Cr Nb steels (AISI Types 429, 444) used on robots within the automotive industry for vehicle exhaust systems.		
450 {46}	29	Welding of pure nickel and nickel alloy. Repair welding of cast iron.	ABS	
640 {65}	36	Welding of Ni-Cr-Fe alloys (Inconel 600 alloy) Welding of carbon steel, stainless steel to Inconel		
770 {79}	41	Welding of Ni-Cr-Mo alloys (Hastelloy) Surfacing steel with Ni-Cr-Mo weld metal.		ABS
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.		
690 {70}	40	Welding of Ni-Cr-Fe alloy. (Inconel 690)		
510 {52}	30	Welding of Ni-Cu alloys (Monel) Surfacing steel with Ni-Cu alloy weld metal.		
780 {80}	40	Welding of Inconel 617 alloy Dissimilar combinations of High temperature alloys.		
510 {52}	30	Welding of Cu-Ni alloys. (Cupro Nickel)	ABS	
370 {38}	37	Welding of Cu-Ni(90Cu/10Ni)alloys. (Cupro Nickel)		
535 {55}	39	Welding of Al-Bronze (Al 8%) Alloy. Surfacing in requiring corrosion resistance and wear resistance.		
556 {57}	32	Welding of Al-Bronze (Al 9%) Alloy. Surfacing in requiring corrosion resistance and wear resistance.		
375 {38}	43	Welding of Silicon (Si 3%) Alloy. Welding of copper-silicon and copper-zinc base metals, to themselves and also to steel.		