

TOKUDEN

WELDING MATERIALS



TOKUDEN CO., LTD.

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PRODUCT TABLE

FOR STAINLESS STEELS					
STEEL TYPE	SMAW	FCAW	GMAW	GTAW	SAW
308	NCF-08	MT-308F	M-308	T-308	U-308 H-308
308L	NCF-08L	MT-308LF	M-308L	T-308L	U-308L H-308L
308LSi			M-308LS		
308N2		MT-308N2			
309	NCF-09	MT-309F	M-309	T-309	U-309
309L	NCF-09L	MT-309LF	M-309L	T-309L	
309Mo	NCF-09Mo			T-309Mo	
309LMo	NCF-09MoL	MT-309MoLF		T-309MoL	
309J		MT-309J			
25-4	NCF-11				
25-9	NCF-19	MT-259			
310	NCF-10				
310Mo	NCF-10Mo				
310S			M-310S	T-310S	
312	NCF-12	MT-312	M-312	T-312	
316	NCF-16		M-316	T-316	H-316
316L	NCF-16L	MT-316LF	M-316L	T-316L	U-316L
316LSi			M-316LS		
316LCu	NCF-16CuL				
317L	NCF-17L	MT-317LF		T-317L	
317J2	NCF-09MN	MT-309MN			
320	NCF-20Cb3			T-20Cb3	
329J1	NCF-329				
329J4L	NCF-329J4L	MT-329J4L		(T-329J4L)	
410	NCF-41		M-410	T-410	H-410
409Nb	NCF-41Cb	MT-410Nb			
420			M-420J2	T-420J2	
430			M-430	T-430	
430Nb	NCF-43Cb				
347 347L	NCF-47 NCF-47L	MT-347F		T-347	
630	NCF-63	MT-630		T-630	
410NiMo	(CX-2RM2-4) (CX-2RM2-5) (CX-2RMO-4)	(MT-2RMO-4) (MT-2RMO-6)		T-2RMO-4	

FOR HEAT RESISTANT ALLOY			
ALLOY TYPE	SMAW	GMAW	GTAW
25Cr-12Ni (ACI HH)	NCF-HH		
28Cr-15Ni (ACI HI)	NCF-HI		
25Cr-20Ni (ACI HK)	NCF-HK	M-HK	T-HK
25Cr-35Ni (ACI HP)	NCF-HP		T-HP
25Cr-45Ni-5W (NA22H)	NIH-22		
25Cr-35Ni-15Co-5W (SUPERTHERM)	WST-55		
25Cr-20Ni-20Co-Mo-W (LCN-155)	NCC		

FOR NICKEL & NICKEL ALLOY				
GRADE		SMAW	GMAW	GTAW
Ni2061	Ni-1	NIB	M-NIB	T-NIB
Ni4060	NiCu-7	NIA	M-NIA	T-NIA
Ni6062	NiCrFe-1	NIC	M-NIC	T-NIC
Ni6082,6182	NiCrFe-3	NIC-3	M-NIC-3	T-NIC-3
Ni6601	NiCrFe-11		M-NIC-601	T-NIC-601
Ni6617	NiCrCoMo-1		M-NIC-617	T-NIC-617
Ni7718	NiFeCr-2		M-NIC-718	T-NIC-718
Ni6625	NiCrMo-3	NIC-625	M-NIC-625	T-NIC-625
Ni1066	NiMo-7			T-HTL-B2
Ni6275	NiCrMo-5	HTL-C		
Ni6276	NiCrMo-4	HTL-C2	M-HTL-C2	T-HTL-C2
Ni6022	NiCrMo-10	HTL-C22	M-HTL-C22	T-HTL-C22
Ni6002	NiCrMo-2		M-HTL-X	T-HTL-X
Others		NCR-50		

FOR CAST IRON				
GRADE		SMAW	GMAW	GTAW
Ni		SN EN	M-SN	T-SN
NiFe		FN FN-S	M-FN M-FN(Ti)	T-FN
Fe		IGF-1 IGF-2		

FOR COPPER & COPPER ALLOY				
ALLOY TYPE	SMAW	GMAW	GTAW	OGW
Cu	CUG-D	M-CU-2	T-CU-1 T-CU-2	
CuSi	CUS	M-CUS	T-CUS	
CuSn	CUP-C	M-CUP-C	T-CUP-C	
CuNi	CUN-1D CUN-3D	M-CUN-1 M-CUN-3	T-CUN-1 T-CUN-3	
CuAl	CUL-A	M-CUL-A	T-CUL-A	
CuNiAl	CUL	M-CUL M-CUL-10 M-CUL-N	T-CUL T-CUL-10	
CuZn				COB T-COB COB-S CUZ

FOR HARD FACING						
TYPE	SMAW	FCAW	GMAW	GTAW	OGW	SAW
Pearlite type	MMB MMA MMD LM-2	MT-250 MT-300				UT-250 UT-250V
Sorbite type	TH-50 TH-350	MT-350				UT-350 UT-350V UT-400 Bond-350VH
Martensite type	TH-450 KM TH-80 KB CD-60 CSW CS-600 QD-600 SF SF-2 SF-3	MT-450 MT-600 MT-700 MT-HVC				UT-450 UT-450V UT-600 Bond-450VH Bond-CXRH Bond-CX-10 Bond-X1 Bond-2RMO-4
Maraging steel	MS-1			T-MS-1(M)		
High Mn type	HM-1 MN	MT-HM				
16%Mn-16%Cr type	CRM-2 CRM-3	MT-CRM-2	M-CRM-2			
13%Cr type	CR-55 TH-11CR CXA-21 CXA-41	MT-CR50 MT-CXRH MT-CXA-21 MT-CXA-21D MT-CXA-40 MT-CXA-41 MT-CXA-41C				UT-CXRH UT-X1 UT-2RMO-4
18%Cr-8%Ni type	BH-1 BH-2					
Cr-Mo-V type	SB HFA-2	MT-HF-2		T-SD-1		
Stellite alloy type	STL-1 STL-2 STL-3 STL-21	MT-STL-1 MT-STL-12 MT-STL-6 MT-STL-21		STL-1G STL-2G STL-3G STL-21G	STL-1G STL-2G STL-3G	
Ni alloy type			M-SA-45	T-SA-45		
Cr-Ni-Co type	NCC-2					
Molybdenum high speed steel	MR-750 TO-9			T-TO-9		
High Cr-Fe type	CRH-226 CRH CRH-Nb CRH-3 CRH-4	MT-FZ10 MT-FZ20 MT-FZ30 MT-FZ90 MT-CRH MT-CRH-3 GAT-FCR GAT-CRB HOWIT-900				UT-225CRV
Tungsten carbide type	TWC TWC-1000	MT-FZ1000			TWC-1G SWC-G	

FOR MILD STEEL, HIGH TENSILE STEEL & LOW ALLOY STEEL			
STEEL TYPE	SMAW	FCAW	SAW
Mild steel	FM FM-2 SOH LC		Bond-50KH
TS ≥ 490MPa	LF	MT-53H	U-36
TS ≥ 590MPa	LF-60	MT-60H	UT-60
TS ≥ 690MPa	LF-70		Bond-CXL-1
TS ≥ 780MPa	LF-80		
Low Alloy steel	TM-85 TM-50CR MOC-1 MOCN-23	MT-CW-1 MT-CW-23 MT-511 MT-521 MT-502F MT-MOCN-23	

FOR TITANIUM		
GRADE	GMAW	GTAW
Ti-2	M-Ti	T-Ti
Ti-3		T-Ti(2)
Ti-7	M-Ti(Pd)	T-Ti(Pd)

FOR ALUMINUM & ALUMINUM ALLOY		
GRADE	GMAW	GTAW
1070	M-ALPS	T-ALPS
1100	M-ALP3	T-ALP3
4043		T-AL43S
4047		T-AL10Si
5356	M-ALC2	T-ALC2
5183	M-ALC7	T-ALC7

WELDING MATERIALS FOR STAINLESS STEEL

Covered Electrodes

BRAND	CORRESPONDING STANDARD AWS A5.4 JIS Z3221	SIZE (mm)	GENERAL DESCRIPTION
NCF-08	E308-16 E308H-16 ES308-16	2, 2.6, 3.2, 4, 5	19Cr-9Ni Austenitic structure, lime-titania type. For welding of 18Cr-8Ni stainless steel.
NCF-08L	E308L-16 ES308L-16	2, 2.6, 3.2, 4, 5	Low-C, 19Cr-9Ni (0.04% max C) Austenitic structure, lime-titania type. For welding of Low C-18Cr-8Ni stainless steel.
NCF-09	E309-16 ES309-16	2, 2.6, 3.2, 4, 5, 6	22Cr-12Ni Austenitic structure, lime-titania type. For welding of 22Cr-12Ni stainless steels or dissimilar metals.
NCF-09L	E309L-16 ES309L-16	3.2, 4, 5	Low-C, 22Cr-12Ni (0.04% max C) Austenitic structure, lime-titania type. For welding of Low C-22Cr-12Ni stainless steels or dissimilar metals.
NCF-09Mo	E309Mo-16 ES309Mo-16	2.6, 3.2, 4, 5	22Cr-12Ni-2Mo Austenitic structure, lime-titania type. For welding of dissimilar metals.
NCF-09MoL	E309LMo-16 ES309LMo-16	2.6, 3.2, 4, 5	Low-C, 22Cr-12Ni-2Mo (0.04% max C) Austenitic structure, lime-titania type. For welding of dissimilar metals.
NCF-09MN	— —	3.2, 4, 5	25Cr-13Ni-1.3Mo-0.2N Austenitic structure, lime-titania type. For welding of 25Cr-12Ni-1Mo-N stainless steels.
NCF-10	E310-16 ES310-16	2.6, 3.2, 4, 5	25Cr-20Ni Austenitic structure, lime-titania type. For welding of 25Cr-20Ni stainless steels or dissimilar metals.
NCF-10Mo	E310Mo-16 ES310Mo-16	3.2, 4, 5	25Cr-20Ni-2Mo Austenitic structure, lime-titania type. For welding of 25Cr-20Ni-2Mo stainless steels or dissimilar metals.
NCF-11	— —	3.2, 4, 5	25Cr-4Ni Ferritic structure, lime-titania type. For welding of 18Cr, 18Cr clad steel or dissimilar metals.
NCF-12	E312-16 ES312-16	2.6, 3.2, 4, 5	29Cr-9Ni Ferrite-Austenitic two-phase structure, lime-titania type. For welding of dissimilar metals.
NCF-16	E316-16 E316H-16 ES316-16	2, 2.6, 3.2, 4, 5	18Cr-12Ni-2Mo Austenitic structure, lime-titania type. For welding of 19Cr-12Ni-2Mo stainless steels.
NCF-16L	E316L-16 ES316L-16	2, 2.6, 3.2, 4, 5	Low-C, 18Cr-12Ni-2Mo (0.04% max C) Austenitic structure, lime-titania type. For welding of Low C-19Cr-12Ni-2Mo stainless steels.
NCF-16CuL	— ES316LCu-16	3.2, 4	Low-C, 19Cr-12Ni-2Mo-Cu (0.04% max C) Austenitic structure, lime-titania type. For welding of Low C-19Cr-12Ni-2Mo-2Cu stainless steels.

Stainless Steel

BRAND	CORRESPONDING STANDARD AWS A5.4 JIS Z3221	SIZE (mm)	GENERAL DESCRIPTION
NCF-17L	E317L-16 ES317L-16	3.2, 4	Low-C, 19Cr-12Ni-3Mo (0.04% max C) Austenitic structure, lime-titania type. For welding of Low C-19Cr-12Ni-3Mo stainless steels.
NCF-19	— —	2.6, 3.2, 4, 5	25Cr-9Ni Ferrite-Austenitic two-phase structure, lime-titania type. For welding of dissimilar metals.
NCF-20Cb3	E320-16 ES320-16	3.2, 4, 5	20Cr-34Ni-3Cu-2Mo-Nb Austenitic structure, lime-titania type. For welding of Carpenter-20Cb3.
NCF-329	— ES329J1-16	3.2, 4, 5	24Cr-7Ni-2Mo-N Ferrite-Austenitic two-phase structure, lime-titania type. For welding of duplex stainless steels.
NCF-329J4L	— ES329J4L-16	3.2, 4, 5	25Cr-9Ni-3.5Mo-N Ferrite-Austenitic two-phase structure, lime-titania type. For welding of duplex stainless steels.
NCF-41	E410-16 ES410-16	3.2, 4, 5	13Cr Martensitic structure, low hydrogen type. For welding of similar composition alloys or hard-facing.
NCF-41Cb	— ES409Nb-16	3.2, 4, 5	13Cr-Nb Ferritic structure, low hydrogen type. For welding of 13Cr stainless steels.
NCF-43Cb	— ES430Nb-16	4	17Cr-Nb Ferritic structure, low hydrogen type. For welding of 18Cr stainless steel.
NCF-47	E347-16 ES347-16	2.6, 3.2, 4, 5	19Cr-9Ni-Nb Austenitic structure, lime-titania type. For welding of 18Cr-9Ni-Nb or 18Cr-8Ni-Ti stainless steels.
NCF-47L	E347-16 ES347L-16	2.6, 3.2, 4, 5	Low-C, 19Cr-9Ni-Nb (0.04% max C) Austenitic structure, lime-titania type. For welding of 18Cr-9Ni-Nb or 18Cr-8Ni-Ti stainless steels.
NCF-63	E630-16 ES630-16	4, 5	17Cr-4Ni-3Cu-Nb (17-4PH) Precipitation-hardening stainless steel, low hydrogen type. For welding of precipitation-hardening stainless steels or hard facing.
CX-2RM2-4	— —	4, 5	13Cr-4Ni Martensitic structure, low hydrogen type. For welding of similar metals or 13Cr stainless steels.
CX-2RM2-5	(E410NiMo-16) (ES410NiMo-16)	4, 5	13Cr-5Ni Martensitic structure, low hydrogen type. For welding of similar metals or 13Cr stainless steels.
CX-2RMO-4	— —	3.2, 4, 5	13Cr-4Ni-1Mo Martensitic structure, low hydrogen type. For welding of similar metals or 13Cr stainless steels.

Flux-Cored Wires for Gas Metal Arc Welding

BRAND	CORRESPONDING STANDARD AWS A5.22 JIS Z3323	SHIELD GAS & SIZE (mm)	GENERAL DESCRIPTION
MT-308F	E308T0-1 E308T0-4 TS308-FB0	CO ₂ 1.2, 1.6	19Cr-9Ni Austenitic structure. For welding of 18Cr-8Ni stainless steel.
MT-308LF	E308LT0-1 E308LT0-4 TS308L-FB0	CO ₂ 0.8, 0.9, 1.2, 1.6	Low-C, 19Cr-9Ni Austenitic structure. For welding of Low C-18Cr-8Ni stainless steel.
MT-309F	E309T0-1 E309T0-4 TS309-FB0	CO ₂ 1.2, 1.6	24Cr-12Ni Austenitic structure. For welding of 22Cr-12Ni stainless steels or dissimilar metals.
MT-309LF	E309LT0-1 E309LT0-4 TS309L-FB0	CO ₂ 0.8, 0.9, 1.2, 1.6	Low-C, 24Cr-12Ni Austenitic structure. For welding of Low C-22Cr-12Ni stainless steels or dissimilar metals.
MT-308N2	— TS308N2-FB0	CO ₂ 1.2, 1.6	22Cr-8Ni-N Austenitic structure. For welding of 18Cr-8Ni-N stainless steel.
MT-309J	— TS309J-FB0	CO ₂ 1.2, 1.6	27Cr-12Ni Austenitic structure. For welding of dissimilar metals.
MT-309MoLF	E309LMoT0-1 TS309LMo-FB0	CO ₂ 1.2, 1.6	24Cr-12Ni-2Mo Austenitic structure. For welding of dissimilar metals.
MT-309MN	— —	CO ₂ 1.2	25Cr-12Ni-1.5Mo Austenitic structure. For welding of 25Cr-13Ni-1Mo-N stainless steels.
MT-316LF	E316LT0-1 E316LT0-4 TS316L-FB0	CO ₂ 0.8, 0.9, 1.2, 1.6	Low-C, 18Cr-12Ni-2Mo Austenitic structure. For welding of Low C-18Cr-12Ni-2Mo stainless steels.
MT-312	E312T0-1 TS312-FB0	CO ₂ 1.2	29Cr-9Ni Ferrite-Austenitic two-phase structure. For welding of dissimilar metals.
MT-317LF	E317LT0-1 E317LT0-4 TS317L-FB0	CO ₂ 1.2, 1.6	Low-C, 19Cr-12Ni-3Mo Austenitic structure. For welding of Low C-19Cr-13Ni-3Mo stainless steels.
MT-329J4L	— TS329J4L-FC0	CO ₂ 1.2	25Cr-9Ni-3Mo-N Ferrite-Austenitic two-phase structure. For welding of duplex stainless steels.
MT-347F	E347T0-1 E347T0-4 TS347-FB0	CO ₂ 1.2, 1.6	19Cr-9Ni-Nb Austenitic structure. For welding of 19Cr-9Ni-Nb stainless steels.
MT-630	— —	CO ₂ 1.2, 1.6	17Cr-Ni-3Cu-Nb (17-4PH) Precipitation-hardening stainless steel. For welding of precipitation-hardening stainless steels or hard facing.
MT-410Nb	— TS409Nb-FC	CO ₂ 1.2, 1.6	13Cr-Nb Ferritic structure. For welding of 13Cr stainless steels.

Stainless Steel

BRAND	CORRESPONDING STANDARD AWS A5.22 JIS Z3323	SHIELD GAS & SIZE (mm)	GENERAL DESCRIPTION
MT-259	— —	CO ₂ 1.2, 1.6	25Cr-9Ni Ferrite-Austenitic two-phase structure. For welding of dissimilar metals.
MT-2RMO-4	(E410NiMoT0-G) —	Ar 1.6	13Cr-4Ni-1Mo Martensitic structure. For welding of similar composition metals or hard-facing.
MT-2RMO-6	— —	Ar 1.6	13Cr-6Ni-1Mo Martensitic structure. For welding of similar composition metals or hard-facing.

Wires for MIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.9 JIS Z3321	SIZE	GENERAL DESCRIPTION
M-308	ER308 YS308	0.8, 0.9, 1, 1.2, 1.6	19Cr-9Ni Austenitic structure. For welding of 18Cr-8Ni stainless steels.
M-308L	ER308L YS308L	0.8, 0.9, 1, 1.2, 1.6	Low-C, 19Cr-9Ni (0.03% max C) Austenitic structure. For welding of Low C-18Cr-8Ni stainless steels.
M-308LS	ER308LSi YS308LSi	0.8, 0.9, 1.2, 1.6	High-Si, Low-C, 19Cr-9Ni (0.03% max C) Austenitic structure. For welding of Low C-18Cr-8Ni stainless steels.
M-309	ER309 YS309	0.8, 0.9, 1, 1.2, 1.6, 2	24Cr-13Ni Austenitic structure. For welding of 22Cr-12Ni stainless steels or dissimilar metals.
M-309L	ER309L YS309L	0.9, 1.2, 1.6	Low-C, 24Cr-13Ni (0.03% max C) Austenitic structure. For welding of Low C-22Cr-12Ni stainless steels or dissimilar metals.
M-316	ER316 YS316	0.8, 0.9, 1.2, 1.6	18Cr-12Ni-2Mo Austenitic structure. For welding of 18Cr-12Ni-2.5Mo stainless steels.
M-316L	ER316L YS316L	0.9, 1.2, 1.6	Low-C, 18Cr-12Ni-2Mo (0.03% max C) Austenitic structure. For welding of Low C-18Cr-12Ni-2.5Mo stainless steels.
M-316LS	ER316LSi YS316LSi	0.9, 1.2, 1.6	High-Si, Low-C, 18Cr-12Ni-2Mo (0.03% max C) Austenitic structure. For welding of Low C-18Cr-12Ni-2.5Mo stainless steels.
M-310S	— YS310S	0.9, 1, 1.2, 1.6	25Cr-20Ni Austenitic structure. For welding of 25Cr-20Ni stainless steels.
M-312	ER312 YS312	1.2, 1.6	29Cr-9Ni Ferrite-Austenitic two-phase structure. For welding of dissimilar metals.

BRAND	CORRESPONDING STANDARD AWS A5.9 JIS Z3321	SIZE	GENERAL DESCRIPTION
M-410	ER410 YS410	1.2, 1.6	13Cr Martensitic structure. For welding of 13Cr stainless steels.
M-420J2	ER420 YS420	1.2, 1.6	13Cr–Mo–Cu Martensitic structure. For welding of 13Cr stainless steels or hard-facing.
M-430	ER430 YS430	1.2, 1.6	17Cr Ferritic structure. For welding of 18Cr stainless steels.

Filler Metals for TIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.9 JIS Z3321	SIZE	GENERAL DESCRIPTION
T-308	ER308 YS308	1.2, 1.6, 2, 2.4, 3.2, 4	19Cr–9Ni Austenitic structure. For welding of 18Cr–8Ni stainless steels.
T-308L	ER308L YS308L	1.2, 1.6, 2, 2.4, 3.2, 4	Low-C, 19Cr–9Ni (0.03% max C) Austenitic structure. For welding of Low C–18Cr–8Ni stainless steels.
T-309	ER309 YS309	1.2, 1.6, 2, 2.4, 3.2, 4	24Cr–13Ni Austenitic structure. For welding of 22Cr–12Ni stainless steels or dissimilar metals.
T-309L	ER309L YS309L	1.6, 2, 2.4, 2.6, 3.2	Low-C, 24Cr–13Ni (0.03% max C) Austenitic structure. For welding of Low C–22Cr–12Ni stainless steels or dissimilar metals.
T-309Mo	ER309Mo YS309Mo	1.6, 2, 2.4, 2.6, 3.2	24Cr–12Ni–2Mo Austenitic structure. For welding of surfacing or dissimilar metals.
T-309MoL	ER309LMo YS309LMo	1.6, 2, 2.4, 3.2	Low-C, 24Cr–12Ni–2Mo (0.03% max C) Austenitic structure. For surfacing of dissimilar metals.
T-316	ER316 YS316	1.2, 1.6, 2, 2.4, 3.2, 4	18Cr–12Ni–2Mo Austenitic structure For welding of 18Cr–12Ni stainless steels or dissimilar metals.
T-316L	ER316L YS316L	1.2, 1.6, 2, 2.4, 3.2, 4	Low-C, 18Cr–12Ni–2Mo (0.03% max C) Austenitic structure. For welding of Low C–18Cr–12Ni stainless steels or dissimilar metals.
T-310S	— YS310S	1.2, 1.6, 2, 2.4, 3.2, 4	25Cr–20Ni Austenitic structure. For welding of 25Cr–20Ni stainless steels or stainless clad steels.
T-312	ER312 YS312	1.2, 1.6, 2, 2.6, 3.2, 4	29Cr–9Ni Ferrite–Austenitic two-phase structure. For welding of dissimilar metals.
T-317L	ER317L YS317L	1.6, 2, 2.4, 2.6	Low-C, 18Cr–12Ni–3Mo (0.03% max C) Austenitic structure. For welding of Low C–18Cr–12Ni–3.5Mo stainless steels.

Stainless Steel

BRAND	CORRESPONDING STANDARD AWS A5.9 JIS Z3321	SIZE	GENERAL DESCRIPTION
T-20Cb3	ER320LR YS320LR	2, 2.4, 3.2	20Cr-34Ni-3Cu-2Mo-Nb Austenitic structure, lime-titania type. For welding of Carpenter-20Cb3.
T-329J4L	— —	1.6, 2, 2.4, 3.2	Low-C, 24Cr-7Ni-3Mo (0.03% max C) Ferrite-Austenitic two-phase structure. For welding of 24Cr-7Ni-2Mo stainless steels.
T-347	ER347 YS347	1.6, 2, 2.4, 3.2	19Cr-9Ni-Nb Austenitic structure. For welding of 18Cr-8Ni-Nb(Ti) stainless steels.
T-410	ER410 YS410	1.6, 2, 2.6, 3.2, 4, 5	13Cr Martensitic structure. For welding of 13Cr stainless steels or hard-facing.
T-420J2	ER420 YS420	1.6, 2, 2.6, 3.2, 4, 5	13Cr-Mo-Cu Martensitic structure. For welding of 13Cr stainless steels or hard-facing.
T-430	ER430 YS430	1.6, 2, 2.6, 3.2	17Cr Ferritic structure. For welding of 18Cr stainless steels.
T-630	ER630 YS630	1.6, 2, 2.4, 3.2	17Cr-4Ni-3Cu-Nb (17-4PH) Precipitation-hardening stainless steel. For welding of precipitation-hardening stainless steels or hard facing.
T-2RMO-4	ER410NiMo YS410NiMo	1.6, 2, 2.4, 3.2	13Cr-4Ni-1Mo Martensitic structure. For surfacing of heat, corrosion and wear resistance.

Fluxes for Submerged Arc Welding

BRAND (Wire+Flux)	CORRESPONDING STANDARD		SIZE (mm)	GENERAL DESCRIPTION
	AWS A5.9	JIS Z3321 JIS Z3352		
U-308 + Bond-S1	ER308 FSS-B1	YS308 SACS2	3.2, 4	19Cr-9Ni Austenitic structure. For welding of 18Cr-8Ni stainless steel.
U-308L + Bond-S1	ER308L FSS-B1	YS308L SACS2	3.2, 4	Low C-19Cr-9Ni Austenitic structure. For welding of Low C-18Cr-8Ni stainless steel.
U-316L + Bond-S1	ER316L FSS-B1	YS316L SACS2	3.2, 4	Low C-18Cr-12Ni-2Mo Austenitic structure. For welding of Low C-18Cr-12Ni-2Mo stainless steels.

Fluxes for Submerged Arc Welding (Band Welding)

BRAND (Hoop+Flux)	CORRESPONDING STANDARD		SIZE (mm)	GENERAL DESCRIPTION
	AWS A5.9	JIS Z3321 JIS Z3352		
H-308 + Bond-S1H	EQ308 FBSS-B	BS308 SACS2	0.4 × 50	19Cr-9Ni Austenitic structure. For welding of 18Cr-8Ni stainless steel.
H-308L + Bond-S1H	EQ308L FBSS-B	BS308L SACS2	0.4 × 50	Low C-19Cr-9Ni Austenitic structure. For welding of Low C-18Cr-8Ni stainless steel.
H-316L + Bond-S1H	EQ316 FBSS-B	BS316L SACS2	0.4 × 50	Low C-18Cr-12Ni-2Mo Austenitic structure. For welding of Low C-18Cr-12Ni-2Mo stainless steels.

WELDING MATERIALS FOR HEAT RESISTANT ALLOY

Covered Electrodes

BRAND	CORRESPONDING STANDARD AWS A5.4 JIS Z3221	SIZE (mm)	GENERAL DESCRIPTION
NCF-HH	— —	3.2, 4, 5	25Cr-13Ni Austenitic structure, lime type For welding of 25Cr-12Ni heat-resisting cast steel.
NCF-HI	— —	3.2, 4, 5	28Cr-15Ni Austenitic structure, lime-titania type For welding of 28Cr-15Ni heat-resisting cast steel.
NCF-HK	E310H-16 ES610H-16	3.2, 4, 5	25Cr-20Ni Austenitic structure, lime-titania type For welding of 25Cr-20Ni heat-resisting cast steel.
NCF-HP	— —	3.2, 4, 5	25Cr-35Ni Austenitic structure, lime-titania type For welding of 25Cr-35Ni heat-resisting cast steel.
NIH-22	— —	3.2, 4, 5	25Cr-45Ni-4.5W Austenitic structure, lime type For welding of heat-resisting cast steel NA22H.
WST-55	— —	3.2, 4, 5	25Cr-35Ni-15Co-5W Austenitic structure, lime type For welding of SUPERTHERM.
NCC	— —	3.2, 4, 5	25Cr-20Ni-20Co-3Mo-2.5W Austenitic structure, lime-titania type For welding of heat-resisting alloys LCN-155 or hard-facing.

Wires for MIG Welding

BRAND	SIZE (mm)	GENERAL DESCRIPTION
M-HK	1.6	25Cr-20Ni Austenitic structure For welding of 25Cr-20Ni heat-resisting cast steel.

Filler Metals for TIG Welding

BRAND	SIZE (mm)	GENERAL DESCRIPTION
T-HK	1.6, 2, 2.4, 3.2	25Cr-20Ni Austenitic structure For welding of 25Cr-20Ni heat-resisting cast steel.
T-HP	2.6, 3.2	25Cr-35Ni Austenitic structure For welding of 25Cr-35Ni heat-resisting cast steel.

WELDING MATERIALS FOR NICKEL AND NICKEL-ALLOY

Covered Electrodes

BRAND	CORRESPONDING STANDARD AWS A5.11 JIS Z3224	SIZE (mm)	GENERAL DESCRIPTION
NIB	ENi-1 ENi2061	3.2, 4	97Ni, Pure nickel. Lime type For welding of pure nickel or dissimilar metals and overlaying on steels.
NIA	ENiCu-7 ENi4060	3.2, 4, 5	65Ni-30Cu, Monel. Lime-titania type For welding of monel, monel clad steels or dissimilar metals.
NIC	(ENiCrFe-1) ENi6062	2.6, 3.2, 4, 5	Ni-15Cr-8Fe-1.5Nb, Inconel. Lime-titania type For welding of Inconel.
NIC-3	ENiCrFe-3 ENi6182	2.6, 3.2, 4, 5	Ni-15Cr-8Fe-6Mn-1.5Nb, Inconel. Lime-titania type For welding of Inconel, dissimilar metals and overlaying on steels.
NIC-625	ENiCrMo-3 ENi6625	4, 5	Ni-21Cr-9Mo-3.5Nb, Inconel. Low hydrogen type For welding of Inconel-625 or overlaying.
HTL-C	ENiCrMo-5 ENi6275	2.6, 3.2, 4	Ni-15Cr-17Mo-5Fe-4W, Hastelloy-C. Lime-titania type For welding of Hastelloy-C, dissimilar metals and overlaying.
HTL-C2	ENiCrMo-4 ENi6276	3.2, 4, 5	Ni-15Cr-17Mo-5Fe-4W, Low-C Hastelloy-C. Lime-titania type For welding of Hastelloy- C, Hastelloy-C276.
HTL-C22	ENiCrMo-10 ENi6022	3.2, 4, 5	Ni-20Cr-13Mo-4Fe-3W, Low-C Hastelloy-C22. Lime-titania type For welding of Hastelloy-C22, Inconel-622 or dissimilar metals.
NCR-50	— —	3.2, 4	50Cr-50Ni $\alpha + \gamma$ two -phase structure, lime type For welding of 50Ni-50Cr alloy castings or overlaying on steels.

Wires for MIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.14 JIS Z3334	SIZE (mm)	GENERAL DESCRIPTION
M-NIB	ERNi-1 SNI2061	1.2, 1.6	97Ni-3Ti, Pure nickel. For welding of pure nickel, dissimilar metals and overlaying on steels.
M-NIA	ERNiCu-7 SNI4060	1.2, 1.6	65Ni-30Cu, Monel. For welding of monel, monel clad steels or dissimilar metals.
M-NIC	ERNiCrFe-5 SNI6062	1.2, 1.6	Ni-15Cr-8Fe-2Nb, Inconel. For welding of Inconel.
M-NIC-3	ERNiCr-3 SNI6082	1.2, 1.6	Ni-20Cr-3Mn-2.5Nb, Inconel. For welding of Inconel, dissimilar metals and overlaying on steels.
M-NIC-601	ERNiCrFe-11 SNI6601	1.2, 1.6	Ni-23Cr-14Fe-1.4Al, Inconel. For welding of Inconel-601.
M-NIC-617	ERNiCrCoMo-1 SNI6617	1.2, 1.6	Ni-22Cr-12.5Co-9Mo-1Al, Inconel. For welding of Inconel-617.
M-NIC-625	ERNiCrMo-3 SNI6625	1.2, 1.6	Ni-21Cr-9Mo-3.5Nb, Inconel. For welding of Inconel-625 or overlaying.
M-NIC-718	ERNiFeCr-2 SNI7718	1.2, 1.6	Ni-18Cr-3Mo-18Fe-5Nb-Al-Ti, Inconel. For welding of Inconel-718.
M-HTL-C2	ERNiCrMo-4 SNI6276	1.2, 1.6	Ni-15Cr-15Mo-5Fe-4W, Low-C Hastelloy-C. For welding of Hastelloy-C, Hastelloy-C276
M-HTL-C22	(ERNiCrMo-10) SNI6022	1.2, 1.6	Ni-22Cr-18Fe-9Mo-W, Low-C Hastelloy-C22. For welding of Hastelloy-C22, Inconel-622 or dissimilar metals.
M-HTL-X	ERNiCrMo-2 SNI6002	1.2, 1.6	Ni-22Cr-18Fe-9Mo-1.5Co-W, Hastelloy-X. For welding of Hastelloy- Alloy X or dissimilar metals.

Nickel and Nickel Alloy

Filler Metals for TIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.14 JIS Z3334	SIZE (mm)	GENERAL DESCRIPTION
T-NIB	ERNi-1 SNI2061	1.6, 2, 2.4, 3.2	97Ni-3Ti, Pure nickel. For welding of pure nickel or dissimilar metals.
T-NIA	ERNiCu-7 SNI4060	1.6, 2, 2.4, 3.2, 4	65Ni-30Cu, Monel. For welding of monel, monel clad steels, dissimilar metals and overlaying on steels.
T-NIC	ERNiCrFe-5 SNI6062	1.6, 2, 2.4, 3.2, 4	Ni-15Cr-8Fe-2Nb, Inconel. For welding of Inconel, dissimilar metals.
T-NIC-3	ERNiCr-3 SNI6082	1.6, 2, 2.4, 3.2, 4	Ni-20Cr-3Mn-2.5Nb, Inconel. For welding of Inconel, dissimilar metals and overlaying on steels.
T-NIC-601	ERNiCrFe-11 SNI6601	1.6, 2, 2.4, 3.2	Ni-23Cr-14Fe-1.4Al, Inconel. For welding of Inconel-601.
T-NIC-617	ERNiCrCoMo-1 SNI6617	1.6, 2, 2.4, 3.2	Ni-22Cr-12.5Co-9Mo-1Al, Inconel. For welding of Inconel-617.
T-NIC-625	ERNiCrMo-3 SNI6625	1.6, 2, 2.4, 3.2	Ni-21Cr-9Mo-3.5Nb, Inconel. For welding of Inconel-625, dissimilar metals and surfacing with Inconel-625.
T-NIC-718	ERNiFeCr-2 SNI7718	1.6, 2, 2.4, 3.2	Ni-18Cr-3Mo-18Fe-5Nb-Al-Ti, Inconel. For welding of Inconel-718.
T-HTL-B2	ERNiMo-7 SNI1066	2, 2.4, 3.2, 4	Ni-28Mo, Low-C Hastelloy-B. For welding of Hastelloy-B or Hastelloy-B2
T-HTL-C2	ERNiCrMo-4 SNI6276	1.6, 2, 2.4, 3.2	Ni-15Cr-15Mo-5Fe-4W, Low-C Hastelloy-C. For welding of Hastelloy-C, Hastelloy-C276
T-HTL-C22	(ERNiCrMo-10) SNI6022	1.6, 2, 2.4	Ni-22Cr-18Fe-9Mo-W, Low-C Hastelloy-C22. For welding of Hastelloy-C22, Inconel-622 or dissimilar metals.
T-HTL-X	ERNiCrMo-2 SNI6002	1.6, 2, 2.4, 3.2	Ni-22Cr-18Fe-9Mo-1.5Co-W, Hastelloy-X. For welding of Hastelloy-X.

WELDING MATERIALS FOR CAST IRON

Covered Electrodes

BRAND	CORRESPONDING STANDARD AWS A5.15 JIS Z3252	SIZE (mm)	GENERAL DESCRIPTION
SN	ENi-CI ECNi-CI	2.6, 3.2, 4, 5, 6	Pure nickel Graphite type Preheating is not required. For repairing, cavity-filling and joining of cast iron.
EN	(ENi-CI) —	2.6, 3.2, 4, 5	Ni Base, 1.5special elements. Graphite type Applications similar to SN, its crack resisting property is quite satisfactory.
FN	ENiFe-CI ECNiFe-CI	2.6, 3.2, 4, 5, 6	45Fe-55Ni Graphite type Preheating is not required. For repairing, cavity-filling, joining of cast iron and dissimilar metals.
FN-S	ENiFe-CI ECNiFe-CI	2.6, 3.2, 4, 5	45Fe-55Ni Graphite type Applications similar to FN. Not glow electrode.
IGF-1	— ECSt	3.2, 4, 5, 6	Carbon steel low hydrogen type Preheating is required. For overlaying of cast iron.
IGF-2	— ECFeC-3	3.2, 4, 5, 6	Grey cast iron Graphite type Preheating is required. For overlaying of cast iron.

Wires for MIG Welding

BRAND	SIZE (mm)	GENERAL DESCRIPTION
M-SN	0.8, 0.9, 1.2, 1.6	Pure nickel Preheating is not required. For repairing, cavity-filling and joining of cast iron.
M-FN	1.2, 1.6	45Fe-55Ni Preheating is not required. For repairing, cavity-filling and joining of cast iron.
M-FN(Ti)	1.2	45Fe-55Ni Preheating is not required. For repairing, cavity-filling and joining of cast iron.

Filler Metals for TIG Welding

BRAND	SIZE (mm)	GENERAL DESCRIPTION
T-SN	2, 2.6, 3.2	Pure nickel Preheating is not required. For repairing, cavity-filling and joining of cast iron.
T-FN	1.2, 1.6, 2, 2.6, 3.2	45Fe-55Ni Preheating is not required. For repairing, cavity-filling and joining of cast iron.

WELDING MATERIALS FOR COPPER AND COPPER ALLOY

Covered Electrodes

BRAND	CORRESPONDING STANDARD AWS A5.6 JIS Z3231	SIZE (mm)	GENERAL DESCRIPTION
CUG-D	— DCu	3.2, 4, 5	99Cu, Pure-copper. For welding of deoxidized coppers, oxygen-free coppers and tough pitch copper.
CUS	(ECuSi) DCuSiB	3.2, 4, 5	95Cu-3Si, Silicon-bronze. For welding of copper-zinc alloys, copper, silicon bronze and overlaying.
CUP-C	ECuSn-C DCuSnB	3.2, 4, 5	92Cu-7Sn-P, Phosphor-bronze. For welding of phosphor bronze, brasses and dissimilar metals.
CUL	(ECuNiAl) —	3.2, 4, 5	90Cu-7Al-1Ni, Aluminum-bronze. For welding of aluminum bronze, dissimilar metals, and surfacing steel with aluminum bronze.
CUL-A	(ECuAl-A2) —	3.2, 4, 5	90Cu-8Al, Aluminum-bronze For welding of aluminum bronze, manganese bronze, high strength copper-zinc alloys.
CUN-1D	— —	3.2, 4, 5	90Cu-10Ni, Cupro-nickel. For welding of 90-10 cupro-nickel.
CUN-3D	— —	3.2, 4, 5	70Cu-30Ni, Cupro-nickel. For welding of 70/30, 80/20, 90/10 cupro-nickel, cupro-nickel clad steel.

Gas Welding Rods

BRAND	SIZE (mm)	GENERAL DESCRIPTION
COB	1.6, 2, 2.6, 3.2, 4, 5	59Cu-40Zn-Sn Flux coated rod. For braze-welding of steels, copper alloy, cast iron, stainless steel.
COB-S	1.6, 2, 2.6, 3.2, 4, 5	58Cu-40Zn-Sn-Ni Flux coated rod. For surfacing on steel, cast iron, copper alloy.
T-COB	1.6, 2, 2.6, 3.2, 4, 5	59Cu-40Zn-Sn For braze-welding of steels. ※ COB flux (For gas welding of copper, copper alloy.)
CUZ	4, 5, 6	45.5Cu-2Ni-0.5Si-52Zn For hard-surfacing of steels, cast iron, copper alloy.

Wires for MIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.7 JIS Z3341	SIZE (mm)	GENERAL DESCRIPTION
M-CU-2	ERCu YCu	1.2, 1.6, 2	>99Cu, Pure-copper. For welding of pure copper.
M-CUL	— YCuAlNi B	1.2, 1.6	90Cu-7Al-1Ni, Aluminum-bronze. For welding of aluminum bronzes and overlaying for corrosion resistant surfaces.
M-CUL-10	— YCuAlNi A	1.2, 1.6	88Cu-10Al-1Ni, Aluminum-bronze. For welding of aluminum bronzes, dissimilar metals and overlaying for corrosion resistant surfaces.
M-CUL-A	ERCuAl-A2 YCuAl	1.2, 1.6	90Cu-9Al, Aluminum-bronze. For welding of aluminum bronzes, aluminum bronzes and overlaying for corrosion resistant surface.
M-CUL-N	ERCuNiAl YCuAlNi C	1.6	80Cu-9Al-5Ni, Aluminum-bronze. For joining or repairing of cast or wrought nickel-aluminum-bronze materials.
M-CUN-1	— YCuNi-1	1.2, 1.6	90Cu-10Ni, Cupro-nickel. For welding of 90-10 cupro-nickel.
M-CUN-3	ERCuNi YCuNi-3	1.2, 1.6	70Cu-30Ni, Cupro-nickel. For welding of 90-10, 70-30 cupro-nickel.
M-CUP-C	— YCuSn B	1.2, 1.6	92Cu-7Sn-P, Phosphor-bronze. For welding of phosphor bronze, dissimilar metals and overlaying for wear resistant surfaces.
M-CUS	ERCuSi-A YCuSi B	1.2, 1.6	95Cu-3.5Si, Silicon-bronze. For welding of silicon bronze and overlaying for wear or corrosion resistant surface.

Copper and Copper Alloy

Filler Metals for TIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.7 JIS Z3341	SIZE (mm)	GENERAL DESCRIPTION
T-CU-1	ERCu YCu	1.6, 2, 2.4, 3.2, 4, 5	>99Cu, Pure-copper. For welding of copper and copper clad steel.
T-CU-2	ERCu YCu	1.6, 2, 2.4, 3.2, 4, 5	>99Cu, Pure-copper. Flux coated rod. Applications similar to T-CU-1.
T-CUL	— YCuAlNi B	2.6, 3.2, 4, 5	90Cu-7Al-1Ni, Aluminum-bronze. For welding of aluminum bronzes, dissimilar metals and overlaying for corrosion resistant surfaces.
T-CUL-10	— YCuAlNi A	3.2, 4, 5	88Cu-10Al-1Ni, Aluminum-bronze. For welding of aluminum bronzes, dissimilar metals and overlaying for corrosion resistant surfaces.
T-CUL-A	ERCuAl-A2 YCuAl	1.6, 2, 2.4, 3.2, 4, 5	90Cu-9Al, Aluminum-bronze. For welding of aluminum bronzes, dissimilar metals and overlaying for corrosion resistant surfaces.
T-CUN-1	— YCuNi-1	1.6, 2, 2.4, 3.2	90Cu-10Ni, Cupro-nickel. For welding of 90-10 cupro-nickel.
T-CUN-3	ERCuNi YCuNi-3	1.6, 2, 2.4, 3.2	70Cu-30Ni, Cupro-nickel. For welding of 90-10, 70-30 cupro-nickel.
T-CUP-C	— YCuSn B	1.6, 2, 2.6, 3.2, 4, 5	92Cu-7Sn-P, Phosphor-bronze. For welding of phosphor bronze, dissimilar metals and overlaying for wear resistant surfaces.
T-CUS	ERCuSi-A YCuSi B	2, 2.4, 3.2, 4	95Cu-3.5Si, Silicon-bronze. For welding of silicon bronze and overlaying for wear or corrosion resistant surface.

WELDING MATERIALS FOR HARD FACING

Covered Electrodes

BRAND	CORRESPONDING STANDARD JIS Z3251	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
MMB	DF2A-200-R	230	3.2, 4, 5, 6	0.1C-0.5Mn Pearlitic structure, High titania type. For surfacing for the intermetallic abrasion.
MMA	DF2A-250-R	250	3.2, 4, 5, 6	0.1C-0.8Mn Pearlitic structure, High titania type. For surfacing for the intermetallic abrasion.
MMD	DF2A-250-R	270	3.2, 4, 5	0.1C-1.5Cr Pearlitic structure, High titania type. For surfacing for the intermetallic abrasion.
LM-2	DF2A-300-B	280	3.2, 4, 5	0.2C-1.4Mn Pearlitic structure, Low hydrogen type. For surfacing for the intermetallic abrasion.
TH-50	DF2A-300-R	320	2.6, 3.2, 4, 5, 6	0.2C-1.6Cr Sorbitic structure, High titania type. For surfacing for the intermetallic and earth abrasion.
TH-350	DF2A-350-B	370	3.2, 4, 5, 6	0.25C-2.5Cr-0.5Mo Sorbitic structure, Low hydrogen type. For surfacing for the intermetallic and earth abrasion.
TH-450	DF2A-450-B	450	3.2, 4, 5, 6	0.25C-2.0Cr-0.5Mo Martensitic structure, Low hydrogen type. For surfacing for the intermetallic and earth abrasion.
KM	DF2B-600-B	590	3.2, 4, 5, 6	0.5C-2.5Mn-2.5Cr Martensitic structure, Low hydrogen type. For surfacing for the intermetallic and earth abrasion.
TH-80	DF3C-600-B	680	3.2, 4, 5, 6	0.7C-5.5Cr-0.5Mo Martensitic structure, Low hydrogen type. For surfacing for the earth abrasion.
KB	DF3C-700-B	770	3.2, 4, 5, 6	1.35C-5.0Cr-0.5B Cr-B martensitic structure, Low hydrogen type. For surfacing for the earth abrasion.
HM-1	DFMA-200-B	200	3.2, 4, 5	0.7C-16Mn High-Mn austenitic steel, Low hydrogen type. For surfacing for the impact abrasion.
MN	DFMB-200-B	200	3.2, 4, 5	0.7C-14Mn-4Ni 13Mn-Ni austenitic steel, Low hydrogen type. For surfacing for the impact abrasion.
CRH-226	—	500	3.2, 4, 5	2C-25Cr Cr-carbide martensitic structure, Lime titania type. For surfacing for the intermetallic and earth abrasion.
CRH	DFCrA-600-B	650	3.2, 4, 5, 6	4.5C-25Cr Cr-carbide martensitic structure, Graphite. For surfacing for the earth abrasion.
CRH-Nb	DFCrA-700-B	820	3.2, 4, 5, 6	5.5C-23Cr-4Nb Cr-Nb-carbide type, Low hydrogen type. For surfacing for the earth abrasion.

Hard Facing

BRAND	CORRESPONDING STANDARD JIS Z3251	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
CRH-3	DFCrA-700-B	950	3.2, 4, 5, 6	5.5C-28Cr-3Nb -0.3V-4W Cr-Nb-V-W-carbide type, Low hydrogen type. For surfacing for the earth abrasion.
CRH-4	DFCrA-700-B	990	3.2, 4, 5	5.5C-24Cr-6Nb-V-3W Cr-Nb-V-W-carbide type, Graphite. For surfacing for the earth abrasion.
TWC	DFWA-700-S	(800)	3.2, 4, 5, 6	50%(W ₂ C+WC) W-carbide type, Graphite. For surfacing for the earth abrasion.
TWC-1000	DFWA-700-S	(1000)	6	70%(W ₂ C+WC) W-carbide type, Special. For surfacing for the earth abrasion.
CR-55	DF4B-500-B	550	3.2, 4, 5	0.35C-13Cr-Ni 13Cr martensitic structure, Low hydrogen type. For surfacing for the intermetallic and earth abrasion.
CD-60	DF4B-600-B	620	3.2, 4, 5, 6	0.4C-11Cr-Mo Martensitic structure, Low hydrogen type. For surfacing dies.
SB	DF3C-600-B	620	2.6, 3.2, 4, 5	0.6C-6Cr-Mo-V Cr-Mo-V-martensitic structure, Low hydrogen type. For surfacing for impact abrasion at elevated temperature.
CSW	DF3B-600-B	630	2.6, 3.2, 4	0.5C-2Si-8Cr Martensitic structure, Low hydrogen type. For surfacing dies.
CS-600	DF3B-600-B	630	3.2, 4, 5	0.5C-8Cr-Mo Martensitic structure, Low hydrogen type. For surfacing dies.
QD-600	—	600	2.6, 3.2, 4, 5	0.35C-8Cr-11W-Mo Cr-W-Mo-carbide martensitic structure, Lime titania type. For surfacing dies.
MR-750	—	730	3.2, 4, 5	0.8C-3Cr-4Mo-V Mo high speed steel, Lime titania type. For surfacing dies.
TO-9	DF5A-700-B	750	3.2, 4	0.8C-4Cr-6Mo-W-V Mo high speed steel, Low hydrogen type. For surfacing dies.
TH-11CR	DF4A-600-B	580	2.6, 3.2, 4, 5	0.3C-12Cr 13Cr- martensitic structure, Low hydrogen type. For repairing dies.
SF	—	500	2.6, 3.2, 4	Martensitic structure, Low hydrogen type. It is an electrode for direct hard surfacing for dies made by cast iron.
SF-2	—	450	2.6, 3.2, 4	Martensitic structure, Lime titania type. It is an electrode for direct hard surfacing for dies made by cast iron.

BRAND	CORRESPONDING STANDARD JIS Z3251	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
SF-3	—	400	2.6, 3.2, 4	Martensitic structure, Low hydrogen type. It is an electrode for direct hard surfacing for dies made by cast iron.
MS-1	—	450	2.6, 3.2, 4	0.02C-18Ni-5Mo-9Co Maraging steel, Low hydrogen type. For surfacing dies.
NCC-2	—	240	4, 5	0.1C-25Cr-20Ni-20Co N-155 austenitic steel, Lime titania type. For surfacing for the impact abrasion at elevated temperature.
BH-1	—	200	3.2, 4, 5	0.2C-18Cr-8Ni Austenitic structure, Low hydrogen type. For surfacing for the impact abrasion at elevated temperature.
BH-2	—	250	3.2, 4, 5	0.3C-8Cr-8Ni-Mo-W Austenitic structure, Low hydrogen type. For surfacing for the impact abrasion at elevated temperature.
CRM-2	DFME-200-B	200	3.2, 4, 5	0.2C-16Cr-16Mn Austenitic structure, Low hydrogen type. For surfacing for the impact abrasion at elevated temperature.
CRM-3	DFME-250-B	280	3.2, 4, 5, 6	0.4C-16Cr-16Mn-Mo-V Austenitic structure, Low hydrogen type. For surfacing for the impact abrasion at elevated temperature.
CXA-21	DF4A-400-B	400	3.2, 4, 5, 6	0.05C-13Cr-2Ni-1Mo Martensitic structure, Low hydrogen type. It is suitable for surfacing of valve and valve sheets.
CXA-41	DF4A-400-B	410	3.2, 4, 5, 6	0.08C-13Cr-4Ni-1Mo Martensitic structure, Low hydrogen type. Applications similar to CXA-21.
STL-1	DCoCrC-600	630	3.2, 4, 4.8	2.5C-50Co-30Cr-12W Stellite, Lime titania type. It is suitable for surfacing for heat, corrosion and wear resistance.
STL-2	DCoCrB-500	520	3.2, 4, 4.8	1.5C-55Co-30Cr-8W Stellite, Lime titania type. Applications similar to STL-1.
STL-3	DCoCrA-400	420	3.2, 4, 4.8	0.9C-55Co-30Cr-5W Stellite, Lime titania type. Applications similar to STL-1.
STL-21	DCoCrD-350	360	3.2, 4, 4.8	0.2C-60Co-28Cr-6Mo Stellite, Lime titania type. Applications similar to STL-1.

Hard Facing

Gas Welding Rods

BRAND	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
TWC-1G	—	3.5	60%(W ₂ C+WC). W-carbide type. For surfacing for the earth abrasion.
SWC-G	850	6	4.5C-35W W-carbide type. It is suitable for surfacing for heat, corrosion and wear resistance.

Filler Metals for TIG Welding

BRAND	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
STL-1G	630	3.2, 4, 4.8, 6.4	2.5C-50Co-30Cr-12W It is suitable for surfacing for heat, corrosion and wear resistance.
STL-2G	520	3.2, 4, 4.8, 6.4	1.5C-55Co-30Cr-8W It is suitable for surfacing for heat, corrosion and wear resistance.
STL-3G	420	3.2, 4, 4.8, 6.4	0.9C-55Co-30Cr-5W It is suitable for surfacing for heat, corrosion and wear resistance.
STL-21G	310	3.2, 4, 4.8, 6.4	0.2C-60Co-28Cr-6Mo It is suitable for surfacing for heat, corrosion and wear resistance.
T-SD-1	600	1.5, 2, 3, 3.2, 4	0.4C-5.5Cr-1.5Mo-V For surfacing dies.
T-MS-1(M)	500	1, 1.2, 1.6, 2, 2.6, 3.2, 4	0.01C-18Ni-5Mo-9Co For surfacing dies.
T-TO-9	700	1.6, 2, 2.6, 3.2	0.8C-4Cr-6Mo-W-V For surfacing dies.
T-SA-45	280	4	Ni-Cr-Mo-Co-Al-Ti + Special element It is suitable for surfacing for heat, corrosion and wear resistance.

Wires for MIG Welding

BRAND	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
M-CRM-2	200	1.2	0.1C-16Cr-16Mn For surfacing for impact abrasion at elevated temperature.
M-SA-45	280	1.6	Ni-Cr-Mo-Co-Al-Ti + Special element It is suitable for surfacing for heat, corrosion and wear resistance.

Band for Band Welding

BRAND (HOOP+FLUX)	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
H-11 + Bond-350VH	350	0.4 × 50	0.15C-2Cr-0.9Mo-0.15V Sorbitic structure. For surfacing for the intermetallic abrasion at elevated temperature.
H-11 + Bond-450VH	450	0.4 × 50	0.15C-4.5Cr-0.9Mo-0.15V Martensitic structure. For surfacing for the intermetallic abrasion at elevated temperature.
H-410 + Bond-CXRH	550	0.4 × 50	0.25C-13Cr 13Cr martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
H-410 + Bond-CX-10	350	0.4 × 50	0.04C-13Cr-2Ni 13Cr martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
H-410 + Bond-X1	390	0.4 × 50	0.06C-13Cr-2Ni-Mo 13Cr martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
H-410 + Bond-2RMO-4	400	0.4 × 50	0.05C-13Cr-4Ni-1Mo 13Cr-Ni-martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.

Hard Facing

Wires for Submerged Arc Welding

BRAND (WIRE+FLUX)	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
UT-250 + F-50	250	3.2, 4	0.1C-1.5Cr Pearlitic structure. For surfacing for the intermetallic abrasion.
UT-250V + F-50	250	3.2, 4	0.02C-1.8Cr-1.2Mo-0.15V Pearlitic structure. For surfacing for the intermetallic abrasion at elevated temperature.
UT-350 + F-50	350	3.2, 4	0.1C-2.5Cr-0.3Mo Sorbitic structure. For surfacing for the intermetallic abrasion.
UT-350V + F-50	350	3.2, 4	0.1C-3.5Cr-1.3Mo-0.15V Sorbitic structure. For surfacing for the intermetallic abrasion at elevated temperature.
UT-400 + F-50	400	3.2, 4	0.2C-3Cr-0.3Mo Martensitic structure. For surfacing for the intermetallic and earth abrasion.
UT-450 + F-50	450	3.2, 4	0.2C-3.5Cr-0.3Mo Martensitic structure. For surfacing for the intermetallic and earth abrasion.
UT-500 + F-80S	530	3.2, 4	0.25C-5.5Cr-1.5Mo-2W-0.3V Martensitic structure. For surfacing for the intermetallic and earth abrasion.
UT-600 + F-80S	600	3.2	0.4C-6Cr-4Mo Martensitic structure. For surfacing for the intermetallic and earth abrasion.
UT-CXRH + F-80S	600	3.2, 4	0.3C-13Cr Martensitic structure. For surfacing for the intermetallic and earth abrasion.
UT-X1 + F-80S	390	3.2, 4	0.07C-13Cr-2Ni-Mo Martensitic structure. For surfacing for corrosion and wear resistance.
UT-2RMO-4 + F-80S	380	3.2, 4	0.05C-13Cr-4Ni-1Mo Martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
UT-225CRV + F-80S	800	3.2, 4	5.7C-25Cr Cr-carbide martensitic structure. For surfacing for the earth abrasion.

Wires for Gas Arc Welding

BRAND	CORRESPONDING STANDARD JIS Z3326	HARDNESS OF WELD METAL HV	SHIELD GAS & SIZE (mm)	GENERAL DESCRIPTION
MT-250	YF2A-C-250	250	CO ₂ 1.2, 1.6	0.06C-1.2Cr Pearlitic structure. For surfacing for the intermetallic abrasion.
MT-300	YF2A-C-300	300	CO ₂ 1.2, 1.6	0.1C-1.3Cr Pearlitic structure. For surfacing for the intermetallic abrasion.
MT-350	YF2A-C-350	350	CO ₂ 1.2, 1.6	0.1C-1.5Cr-0.4Mo Sorbitic structure. For surfacing for the intermetallic and earth abrasion.
MT-450	YF2A-C-450	450	CO ₂ 1.2, 1.6	0.2C-2.6Cr-0.6Mo-0.5V Martensitic structure. For surfacing for the intermetallic and earth abrasion.
MT-600	YF3B-C-600	600	CO ₂ 1.2, 1.6	0.3C-2.5Si-7Cr-0.6Mo Martensitic structure. For surfacing for the intermetallic and earth abrasion.
MT-700	YF3B-C-700	700	CO ₂ 1.2, 1.6	0.5C-3Si-8Cr Martensitic structure. For surfacing for the intermetallic and earth abrasion.
MT-HVC	YF3B-C-800	800	CO ₂ 1.2, 1.6	0.8C-10Cr Martensitic structure. For surfacing for the intermetallic and earth abrasion.
MT-FZ10	—	750	CO ₂ 1.2, 1.6	High Cr-Fe Cr-carbide austenitic structure. For surfacing for the earth abrasion.
MT-FZ20	—	800	CO ₂ 1.2, 1.6	High Cr-Fe Cr-carbide austenitic structure. For surfacing for the earth abrasion.
MT-FZ30	—	900	CO ₂ 1.2, 1.6	High Cr-Fe Cr-carbide austenitic structure. For surfacing for the earth abrasion.
MT-FZ90	—	920	CO ₂ 1.6	High Cr-Fe Cr-Nb-V-W-carbide austenitic structure. For surfacing for the earth abrasion.
MT-FZ1000	—	1030	Ar 1.6	W-carbide type. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-CRH	YFCrA-C-700	700	CO ₂ 1.6	4.8C-24Cr Cr-carbide martensitic structure. For surfacing for the earth abrasion.
MT-CRH-3	YFCrA-C-800	900	CO ₂ 1.6	5.3C-24Cr-2Nb-0.6V-4W Cr-Nb-V-W-carbide type. For surfacing for the earth abrasion.
MT-HM	YFMA-C-200	220	CO ₂ 1.6	0.8C-13Mn Austenitic structure. For surfacing for the impact abrasion.
MT-HF-2	—	430	CO ₂ 1.2, 1.6	0.1C-5Cr-Mo-V For surfacing dies.
MT-CR50	YF4B-C-500	530	CO ₂ 1.6	0.2C-12Cr 13Cr- martensitic structure. For surfacing for the intermetallic and earth abrasion.

Hard Facing

BRAND	CORRESPONDING STANDARD JIS Z3326	HARDNESS OF WELD METAL HV	SHIELD GAS & SIZE (mm)	GENERAL DESCRIPTION
MT-CXRH	YF4B-C-600	650	CO ₂ 1.6	0.3C-12Cr 13Cr- martensitic structure. For surfacing for the intermetallic and earth abrasion.
MT-CRM-2	YFME-C-250	250	CO ₂ 1.2, 1.6	0.1C-16Cr-16Mn Austenitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-CXA-21	YF4A-G-400	400	Ar 1.6	0.06C-13Cr-2Ni-1Mo Martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-CXA-21D	YF4A-G	400	Ar 1.6	0.06C-13Cr-2Ni-1Mo(first layer) Martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-CXA-40	YF4A-G-400	380	Ar 1.6	0.05C-13Cr-4Ni Martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-CXA-41	YF4A-G-400	400	Ar 1.6	0.06C-13Cr-4Ni-1Mo Martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-CXA-41C	YF4A-C-400	400	CO ₂ 1.2, 1.6	0.06C-13Cr-4Ni-1Mo Martensitic structure. It is suitable for surfacing for heat, corrosion and wear resistance.
MT-STL-1	—	650	Ar 1.6	2.5C-50Co-30Cr-12W It is suitable for surfacing for heat, corrosion and wear resistance.
MT-STL-12	—	520	Ar 1.6	1.5C-55Co-30Cr-7W It is suitable for surfacing for heat, corrosion and wear resistance.
MT-STL-6	—	430	Ar 1.6	0.9C-55Co-30Cr-4W It is suitable for surfacing for heat, corrosion and wear resistance.
MT-STL-21	—	340	Ar 1.6	0.2C-60Co-28Cr-5Mo It is suitable for surfacing for heat, corrosion and wear resistance.

Flux-cored Wire for Self Shield Arc Welding

BRAND	CORRESPONDING STANDARD JIS Z3251	HARDNESS OF WELD METAL HV	SIZE (mm)	GENERAL DESCRIPTION
GAT-FCR	YFCrA-S-800	800	3.2	5.5C-21Cr Cr-carbide martensitic structure. For surfacing for the earth abrasion.
GAT-CRB	YFCrA-S-800	800	3.2	5.3C-22Cr-4Nb Cr-carbide martensitic structure. For surfacing for the earth abrasion.
HOWIT-900	YFCrA-S-800	850	3.2	6C-22Cr-6.5Nb-5.5Mo-1.5W Cr-Nb-Mo-W-carbide martensitic structure. For surfacing for the wear parts at elevated temperature.

WELDING MATERIALS FOR MILD STEEL, HIGH TENSILE STEEL AND LOW ALLOY STEEL

Covered Electrodes

BRAND	CORRESPONDING STANDARD AWS JIS	SIZE (mm)	GENERAL DESCRIPTION
FM	— Z3211 E4319	2.6, 3.2, 4, 5, 6	Ilmenite type. For welding of mild steel or 490–540MPa high tensile steels.
FM-2	— Z3211 E4319	3.2, 4	Ilmenite type. For welding of mild steels.
SOH	A5.1 E6012 Z3211 E4313	2.6, 3.2, 4, 5	High titania type. For welding of mild steels.
LC	— —	3.2, 4, 5, 6	Low hydrogen type. For welding of pure iron.
LF	A5.1 E7016 Z3211 E5516-G	3.2, 4, 5, 6	Low hydrogen type. For welding of mild steels or 520MPa high tensile steels.
LF-60	(A5.5 E9016-G) Z3211 E6216-N1M1	3.2, 4, 5, 6	Low hydrogen type. For welding of mild steel or 590MPa high tensile steels.
LF-70	(A5.5 E10016-G) Z3211 E6916-N3CM1	5	Low hydrogen type. For welding of mild steel or 690MPa high tensile steels.
LF-80	(A5.5 E11016-G) Z3211 E7816-N4CM2	4, 5	Low hydrogen type. For welding of mild steel or 780MPa high tensile steels.
TM-85	A5.5 E7016-A1 Z3223 E4916-1M3	3.2, 4, 5	Low hydrogen type. For welding of C-Mo steels, Cr-Mo steels or high tensile steels.
TM-50CR	— —	3.2, 4, 5	Low hydrogen type. For welding for sulfuric acid resistant steel.
MOC-1	A5.5 E8016-B2 Z3223 E5516-1CM	3.2, 4, 5	Low hydrogen type. For welding of 1.25Cr-0.5Mo steels.
MOCN-23	— —	4, 5, 6	Low hydrogen type. For welding of 1.5Ni-0.5Cr-0.2Mo steels.

Mild Steel, High Tensile Steel and Low Alloy Steel

Wires for MIG Welding or MAG Welding

BRAND	CORRESPONDING STANDARD AWS JIS	SHIELD GAS & SIZE (mm)	GENERAL DESCRIPTION
MT-53H	A5.20 E71T-1 Z3313 T49J0T1-CA	CO ₂ 1.2, 1.6	For welding of mild steel or 490 MPa high tensile steels.
MT-60H	A5.29 E80T1-A1 Z3318 T55T1-0C-2M3	CO ₂ 1.2, 1.6	For welding of mild steel or 590 MPa high tensile steels.
MT-CW-1	— —	CO ₂ 1.2, 1.6	0.5Cu For welding for sulfuric acid resistant steel.
MT-CW-23	— —	CO ₂ 1.2, 1.6	0.7Cr-0.3Cu For welding for sulfuric acid resistant steel.
MT-511	A5.29 E80T1-B2 Z3318 T55T1-1C-1CML	CO ₂ 1.2, 1.6	1.25Cr-0.5Mo For welding of heat resistant alloy.
MT-521	A5.29 E90T1-B3 Z3318 T62T1-1C-2C1ML	CO ₂ 1.6	2.25Cr-1Mo For welding of heat resistant alloy.
MT-502F	A5.22 E502T0-1 —	CO ₂ 1.2, 1.6	5Cr-0.5Mo For welding of heat resistant alloy.
MT-MOCN-23	— —	CO ₂ 1.2, 1.6	1.5Ni-0.3Cr-0.3Mo For welding of high tensile steel or low alloy steels.

Wires for Submerged Arc Welding

BRAND (Wire+Flux)	SIZE (mm)	GENERAL DESCRIPTION
UT-60 + F-50	3.2, 4	0.5Mo For welding of 590MPa high tensile steels.
U-36 + F-50	2.4, 3.2, 4, 4.8	This is a solid wire. For welding of 490MPa high tensile steel or mild steel.

Hoops for Submerged Arc Welding

BRAND (Hoop+Flux)	SIZE (mm)	GENERAL DESCRIPTION
H-11 + Bond-50KH	0.4 × 50	For welding of mild steels or underlaying.
H-11 + Bond-CXL-1	0.4 × 50	2.5Ni-1Cr-0.4Mo For welding of high tensile steels.

Titanium

WELDING MATERIALS FOR TITANIUM

Wires for MIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.10 JIS Z3331	SIZE (mm)	APPLICATION
M-Ti	(ERTi-2) STi0100J	1.2, 1.6	For welding of pure titanium.
M-Ti(Pd)	(ERTi-7) STi2251J	1.2, 1.6	For welding of Pd-titanium.

Filler Metals for TIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.10 JIS Z3331	SIZE (mm)	APPLICATION
T-Ti	(ERTi-2) STi0100J	1.6, 2, 2.4	For welding of pure titanium.
T-Ti(Pd)	(ERTi-7) STi2251J	1.6	For welding of Pd-titanium.
T-Ti(2)	(ERTi-3) STi0120J	1.2, 1.6, 2, 2.4, 3.2	For welding of pure titanium.

WELDING MATERIALS FOR ALUMINUM

Wires for MIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.10 JIS Z3232	SIZE (mm)	APPLICATION
M-ALPS	— A1070-WY	1.6, 2.4	1050, 1070, 1080, 1100, 1200
M-ALP3	ER1100 A1100-WY	1.6, 2.4	1100, 1200, 3003, 3203
M-ALC2	ER5356 A5356-WY	1.2, 1.6, 2.4	5052, 5154, 5083, 6061, 6063
M-ALC7	ER5183 A5183-WY	1.2, 1.6, 2.4	5083, 5154, 6061, 6063

Filler Metals for TIG Welding

BRAND	CORRESPONDING STANDARD AWS A5.10 JIS Z3232	SIZE (mm)	APPLICATION
T-ALPS	— A1070-BY	1.6, 2, 2.4, 3.2, 4	1050, 1070, 1080, 1100, 1200
T-ALP3	ER1100 A1100-BY	1.6, 2, 2.4, 3.2, 4	1100, 1200, 3003, 3203
T-AL43S	ER4043 A4043-BY	1.6, 2, 2.4, 3.2, 4	1100, 1200, 3003, 3203, 4043, 5052
T-AL10Si	ER4047 A4047-BY	1.6, 2, 2.4, 3.2	1100, 3003, 4032, 4043, 5052
T-ALC2	ER5356 A5356-BY	1.6, 2, 2.4, 3.2, 4	5052, 5154, 5083, 6061, 6063
T-ALC7	ER5183 A5183-BY	1.6, 2, 2.4, 3.2, 4	5083, 5154, 6061, 6063