

Welding Consumables for Offshore Wind Turbines and Related Applications

Welding Consumables for Offshore Wind Turbine Towers (-40°C Low-Temperature Toughness)

Steel Grade	Welding Process	Brand Name	Features	Specifications
S355	MCAW	SM-3A	Narrow Gap [Ar+CO ₂]	AWS A5.18 E70C-GM H4 EN ISO17632-A-T 42 4 ZMn M M21 1 H5
		SF-3A	All Positions [Ar+CO ₂]	AWS A5.20 E71T-9M-J H4 EN ISO17632-A-T 46 4 ZMnNi P M21 1 H5
	FCAW	SF-3M	All Positions [CO ₂]	AWS A5.20 E71T-9C-J H4 EN ISO17632-A-T 46 4 ZMnNi P C1 2 H5
		NF-1 / Y-E	Narrow Gap	AWS A5.23 F8A4-EG-G
	SAW	NB-55E / Y-D	Multi Pass Welding	AWS A5.17 F7A8-EH14
		L-55SN	Low Hydrogen All Positions	AWS A5.5 E7016-G EN ISO2560-A-E 46 6 ZMnNi B 1 2
S420 S460	MCAW	SM-47A	Narrow Gap [Ar+CO ₂]	AWS A5.28 E80C-G H4 EN ISO17632-A-T 46 6 1Ni M M21 1 H5
		SF-3AM	All Positions [Ar+CO ₂]	AWS A5.29 E81T1-Ni1M H4 EN ISO17632-A-T 46 6 ZMn1Ni P M21 2 H5
	FCAW	SF-47E	All Positions [CO ₂]	AWS A5.29 E81T1-Ni1C-J H4 EN ISO17632-A-T 46 6 ZMn1Ni P C1 2 H5
		NB-55E / Y-DM3	Multi Pass Welding	AWS A5.23 F8A4-EG-G
	SAW	L-57SN	Low Hydrogen All Positions	AWS A5.5 E8016-G EN ISO2560-A-E 46 6 ZMnNi B 1 2
		NITTETSU L-60W	Root Welding All Positions	AWS A5.5 E8016-G



Typical Mechanical Properties of All-weld Metal

Steel Grade	Welding Process	Brand Name	Shielding gas	Mechanical properties			
				YS MPa	TS MPa	El %	vE-40°C J
S355	MCAW	SM-3A	Ar+CO ₂	540	600	29	70
		SF-3A	Ar+CO ₂	574	639	28	80
	FCAW	SF-3M	CO ₂	515	585	30	115
		NF-1 / Y-E	—	480	570	29	130
	SAW	NB-55E / Y-D	—	460	560	33	200
		L-55SN	—	517	573	31	140
S420 S460	MCAW	SM-47A	Ar+CO ₂	584	660	29	110
		SF-3AM	Ar+CO ₂	544	605	30	105
	FCAW	SF-47E	CO ₂	550	615	29	115
		NB-55E / Y-DM3	—	530	650	26	140
	SAW	L-57SN	—	520	580	31	160
		NITTETSU L-60W	—	555	626	32	110

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Welding Consumables for the Jack-up Legs of a Wind Turbine Installation Vessel

Welding Process	Brand Name	Polarity	Welding Position	Specification	Approval Ship Class			
					ABS	DNV	LR	BV
SMAW	L-80SN	AC/DC	All Positions	AWS A5.5 E11016-G	5YQ690MW	5Y69 H5	5Y69m H5	5Y69 H5
SAW	NB-250J / Y-80J	AC/DC	Flat Horizontal	AWS A5.23 F11A10-EG-G	5YQ690M H5	V Y69M H5	5Y69M H5	A4Y69M H5
GMAW	YM-80A [Ar+CO ₂]	DCEP	Flat Horizontal	AWS A5.28 ER110S-G	4YQ690SA	IV Y69MS	—	—
FCAW	SF-80A [Ar+CO ₂]	DCEP	All Positions	AWS A5.29 E111T1-GM-H4	4YQ690SA H5	IV Y69MS H5	4Y69S H5	SA4Y69 H5
MCAW	SM-80A [Ar+CO ₂]	DCEP	Flat Horizontal	AWS A5.28 E110C-G-H4	4YQ690SA H5	IV Y69MS H5	—	—

Typical Mechanical Properties of All-weld Metal

Welding Process	Brand Name	Welding Position	Shielding Gas	Mechanical Properties				
				Polarity	YS MPa	TS MPa	El %	vE-40°C J
SMAW	L-80SN	All Positions	—	AC	799	861	20	107
				DCEP	758	835	21	98
SAW	NB-250J / Y-80J	Flat Horizontal	—	AC	773	869	24	112
				DCEP	749	851	25	104
GMAW	YM-80A	Flat Horizontal	Ar+CO ₂	DCEP	698	898	22	74
FCAW	SF-80A	All Positions	Ar+CO ₂	DCEP	795	825	23	76
MCAW	SM-80A	Flat Horizontal	Ar+CO ₂	DCEP	755	812	22	95



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Warning!

Fumes and gas may be hazardous to your health. Please take appropriate preventive measures such as the implementation of ventilation as well as wearing a protector for breathing. Arc light is harmful to the eyes and skin. Please use appropriate shielding measures. Please do not touch anything where electricity is activated. It may cause death.

Request to Customers

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