

Outershield® 81Ni1-H

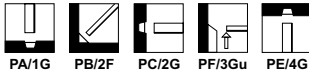
CLASSIFICATION

AWS A5.29	E81T1-Ni1M-J (all diameters)	A-Nr	10
EN ISO 17632-A	T 50 51Ni P M 2 H5 (only diameter 1.2 mm)	F-Nr	6
		9606 FM	2

GENERAL DESCRIPTION

All position gas shielded 1% Ni flux cored wire, offshore and similar applications
 Superior weldability, low spatter, good bead appearance
 Outstanding operator appeal
 Exceptional mechanical properties [CVN >47] at -50°C
 Superior product consistency with optimal alloy control
 Excellent wire feeding
 Meets NACE MR-0175 requirements
 For PWHT, use Outershield 81Ni1-HSR

WELDING POSITIONS (ISO/ASME)



CURRENT TYPE / SHIELDING GAS (ISO 14175)

DC +
 M21 : Mixed gas Ar+ (>15-25%) CO₂
 Flow rate: 15-25 l/min

APPROVALS

Shielding gas	RINA	BV	DNV	GL	LR
M21	4YSH5	SA3,3YMHH	IVYMSH5	4YH10S	4Y40SH5

CHEMICAL COMPOSITION (W%), TYPICAL, ALL WELD METAL

Shielding gas	C	Mn	Si	P	S	Ni	HDM
M21	0.05	1.4	0.2	0.013	0.010	0.95	3 ml/100 g

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
						-40°C	-50°C
Required: AWS A5.29 EN ISO 17632-A			min. 470 min. 500	550-690 560-720	min. 19 min. 18	min. 27	min. 47
Typical values	M21	AW	530	600	24	90	60

PACKAGING AND AVAILABLE SIZES

Diameter (mm)	1.0	1.2	1.4	1.6	2.0
4.5 kg plastic spool S200	X	X			
16 kg S300 (alu bag)	X	X	X	X	X
16 kg spool B300		X	X		
16 kg spool B5300		X			

Outershield® 81Ni1-H; rev. C-EN31-22/06/17

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EXAMPLES OF MATERIALS TO BE WELDED

Steel grades/Standard	Type
General structural steels	
EN 10025 part 2	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steels	
EN 10213-2	G P 240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB
API 5LX	X42, X46, X52, X60, X65, X70
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steels	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steels	
EN 10025 part 3	S275N, S275NL, S355N, S355NL, S420N, S420NL, S460N, S460NL
EN 10025 part 4	S275M, S275ML, S355M, S355ML, S420M, S420ML, S460M, S460ML

CALCULATION DATA

Diameter (mm)	Electrical stick-out (mm)	Wire Feed Speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition rate (kg/h)	kg wire/ kg weldmetal
1.2	20	445	130	20-22	1.6	1.20
		700	180	23-25	2.5	1.20
		950	220	25-27	3.4	1.20
		1270	265	27-29	4.5	1.20
		1590	305	30-32	5.9	1.20
1.6	20	320	170	21-23	1.9	1.20
		510	235	22-24	3.1	1.20
		635	275	24-25	3.9	1.20
		760	310	25-27	4.7	1.20
		890	350	27-29	5.6	1.20
		1015	385	28-30	6.4	1.20
		1080	400	30-31	6.8	1.20

WELDING PARAMETERS, OPTIMUM FILL PASSES IN SHIELDING GAS Ar + [\geq 15-25]% CO₂

Diameter (mm)	Welding positions				
	PA/1G	PB/2F	PC/2G	PF/3Gup	PE/4G
1.2	230-280A	230-280A	200-240A	200-240A	160-220A
	26-32V	26-32V	25-32V	25-28V	23-28V
1.6	250-350A	250-350A	230-280A	220-260A	170-240A
	24-32V	24-32V	24-32V	24-28V	22-28V

FCAW