

Outershield® 81Ni1-H

Low temperature rutile cored wire

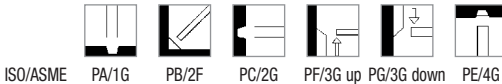
Classification

AWS A5.29-98 : E81T1-Ni1MJ H4 (all diameters)
 EN 758-97 : T 50 5 1Ni P M 2 H5 (only diameter 1.2 mm)

General description

All position gas shielded 1% Ni flux cored wire, offshore and similar applications
 Superior weldability, low spatter, good bead appearance
 Outstanding operators appeal
 Exceptional mechanical properties (CVN >47J at -40°C)
 Very low hydrogen H_{bm} <5 ml/100g)
 Superior product consistency with optimal alloy control
 Excellent wire feeding

Welding positions



Current type/Shielding gas

DC +
 Ar+ (>5-25)% CO₂ (EN 439: M21)
 15-25 l/min

Approvals

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

Chemical composition (w%), typical, all weld metal

Shielding gas	C	Mn	Si	P	S	Ni	H _{bm} ml/100g
M21	0.05	1.4	0.2	0.013	0.010	0.95	3

Mechanical properties, 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 A5.29-98			min. 470	550-690	min. 19	min. 27	
EN 758-97			min. 500	560-720	min. 18	min. 47	
Typical values	M21	AW	530	600	24	90	60

Packaging and available sizes

Unit type	Net weight/unit (kg)	Diameter (mm)	
		1.2	1.6
Plastic spool S200	4.5	X	
Wire reel B300	15	X	X
Wire reel B435	25		X

Outershield® 81Ni1-H: rev. EN 15

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Materials to be welded

Steel	Code	Type
General structural steel	EN 10025	S185, S235, S275, S355
Ship plates	ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	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
	EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
	EN 10028-2	P235GH, P265GH, P295GH, P355GH
Boiler & pressure vessel steel	EN 10113-2	S275, S275, S355, S420
	EN 10113-3	S275M, S275ML, S355M, S355ML, S420M, S420ML

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 weld metal
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, shielding gas Ar + (>5 - 25)% CO₂

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