

# Outershield® 81Ni1-HSR

## CLASSIFICATION

AWS A5.29	E81T1-Ni1M-J	A-Nr	10
EN ISO 17632-A	T 50 5 1Ni P M 2 H5 T	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
- Specific design for stress relieved applications, guaranteed impact properties after PWHT
- Meets NACE MR-0175 requirements

## WELDING POSITIONS (ISO/ASME)



## CURRENT TYPE / SHIELDING GAS (ISO 14175)

DC+	
M21	Mixed gas Ar+ (>15-25%) CO <sub>2</sub>
Flow rate	15-25 l/min

## APPROVALS

Shielding gas	BV	DNV	GL	LR	TÜV	DB
M21	4YSDH5	IVYMSH5	4YH5S	4YSH5	+	+

## 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 <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(I)	
						-40°C	-50°C
Required: AWS A5.29			min. 470	550-690	min. 19	min. 27	
EN ISO 17632-A			min. 500	560-720	min. 18	min. 47	
Typical values	M21	AW	530	600	24	90	60
		SR 1h/600°C, 3G up - V45°	525	590	25		70

## PACKAGING AND AVAILABLE SIZES

Diameter (mm)	1.2	1.6
16 kg spool B300	X	X
16 kg spool S300	X	

# Outershield® 81Ni1-HSR

## EXAMPLES OF MATERIALS TO BE WELDED

Steel grades	Standard	Type
<b>General structural steels</b>	EN 10025	S185, S235, S275, S355
<b>Ship plates</b>	ASTM A131	Grade A, B, C, D, AH32 to DH36
<b>Cast steels</b>	EN 10213-2	GP240R
<b>Pipe material</b>	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
<b>Boiler &amp; pressure vessel steels</b>	EN 10028-2	P235GH, P265GH, P295GH, P355GH
<b>Fine grained steels</b>	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 + [15-25]% CO<sub>2</sub>

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