

# Outershield 81K2-HSR

## Low temperature rutile cored wire

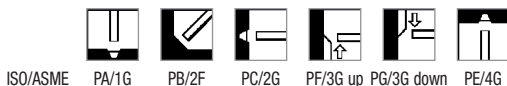
### Classification

AWS A5.29 : E81T1-K2M-JH4  
EN 758 : T 50 6 1.5Ni P M 2 H5

### General description

All position gas shielded 1.5% Ni alloyed flux cored wire for offshore and similar applications  
Specific design for stress relieved applications, guaranteed impact properties after PWHT  
Superior weldability, low spatter, good bead appearance and outstanding operators appeal  
Exceptional mechanical properties (CVN >80J at -60°C)  
Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
Superior product consistency with optimal alloy control  
Excellent wire feeding

### Welding positions



### Current type/Shielding gas

DC +  
Ar+ (>5-25)% CO<sub>2</sub> (EN 439: M21)  
15-25 l/min

### Approvals

Shielding gas	DNV	LR
M21	Pending	Pending

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

Shielding gas	C	Mn	Si	P	S	Ni	H <sub>DM</sub> ml/100g
M21	0.06	1.3	0.3	0.012	0.010	1.4	3

### Mechanical properties, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V (J)		
						-40°C	-50°C	-60°C
Required: A5.29			min. 470	550-690	min.19	min. 27		
EN 758			min. 500	560-720	min.18			
Typical values	M21	AW	590	630	23	140	100	80
	M21	SR	570	620	24			85

SR 1h/600°C, 3G up - V45°

### Packaging and available sizes

Unit type	Net weight/unit (kg)	Diameter (mm)
Wire reel B300	15	X

Outershield 81K2-HSR: rev. EN 20

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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	S275, S355, S420, S460

## 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

## Welding parameters, optimum fill, shielding gas Ar + (>5 - 25)% CO<sub>2</sub>

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