

# Outershield® 81K2-H

## CLASSIFICATION

<b>AWS A5.29</b>	E81T1-K2M-J (all diameters)	<b>A-Nr</b>	10
<b>EN ISO 17632-A</b>	T 50 6 1.5Ni P M 2 H5 (only diameter 1.2 mm)	<b>F-Nr</b>	6
		<b>9606 FM</b>	2

## GENERAL DESCRIPTION

All position gas shielded 1.5% Ni, Ti and B alloyed flux cored wire  
 Used in off-shore and similar applications  
 Superior weldability, low spatter, good bead appearance  
 Outstanding operator appeal  
 Exceptional mechanical properties (CVN >80J at -60°C)  
 Superior product consistency with optimal alloy control  
 Excellent wire feeding  
 For PWHT, use Outershield 81K2-HSR

## 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	DNV	RINA	LR	RMRS	CWB
M21	IVY46MSH5	4YS	4Y40SH5	4Y50SH5	+

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

Shielding gas	C	Mn	Si	P	S	Ni	HDM
M21	0.04	1.4	0.2	0.012	0.010	1.4	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(J)		
						-40°C	-50°C	-60°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	590	630	23	130	100	80

## PACKAGING AND AVAILABLE SIZES

Diameter (mm)	1.2	1.6
4.5 kg plastic spool S200	X	
16 kg S300 (alu bag)	X	
16 kg spool B300	X	
25 kg wire reel B435		X

Outershield® 81K2-H: rev. C-EN29-22/06/17

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## EXAMPLES OF MATERIALS TO BE WELDED

Steel grades/Standard	Type
<b>General structural steels</b>	
EN 10025 part 2	S185, S235, S275, S355
<b>Ship plates</b>	
ASTM A131	Grade A, B, D, AH32 to EH40
<b>Cast steels</b>	
EN 10213-2	G P 240R
<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
EN 10025 part 6	S460Q, S460QL, S460QL1, S500S, S500QL, S500QL1

## 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