

# Outershield 12-H

## Creep resistant rutile cored wire

### Classification

AWS A5.29/A5.29M : E 81T1-A1M-H4  
 EN 12071 : T MoL P M 2 H5

### General description

All position mix gas shielded 0.5% Mo-alloyed rutile cored wire  
 Superior weldability, low spatter, good bead appearance  
 Outstanding operator appeal  
 Very low hydrogen content ( $H_{DM} < 5$  ml/100 g)  
 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

Tüv  
 Pending

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

Shielding gas	C	Mn	Si	P	S	Mo	H <sub>DM</sub> ml/100g
M21	0.065	0.8	0.2	0.014	0.010	0.46	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)	
						+20°C	-20°C
Required: AWS A5.29 EN 12071		SR <sup>1)</sup>	min. 470	550-690	min. 19	not required	
		SR <sup>2)</sup>	min. 355	min. 510	min. 22	47	
Typical values:	M21	SR <sup>3)</sup>	540	600	26	160	79

Stress relieving: SR<sup>1)</sup> = 620 ± 15°C/1h, SR<sup>2)</sup> = 570-620°C/1h, SR<sup>3)</sup> = 1h/620°C

### Packaging and available sizes

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

Outershield 12-H: rev. EN 20

# Outershield 12-H

## Materials to be welded

Steel	Code	Type
Creep resisting steel	EN 10028-2	P295 G H, P355 G H, 16 Mo 3
	EN 10222-2	17 Mo 3, 14 Mo 6
Fine grained steel	EN 10113-2	S275, S355, S420
	EN 10113-3	S275, S355, S420

## 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

## Remarks

Recommended PWHT temperature: 570-630°C

Time depends on material thickness