Outershield® 12-H

Creep resistant rutile cored wire

Classification

AWS A5.29/A5.29M : E81T1-A1M-H4
ISO 17634-A : 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 (H_{DM} <5 ml/100g)
Superior product consistency with optimal alloy control
Excellent wire feeding

Welding positions

ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G

Current type/Shielding gas (ISO 14175)

DC +
M21 : Mixed gas Ar+ (>15-25%) CO_2
Amount : 15-25 l/min

Approvals

TÜV
+

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

Shielding gas	C	Mn	Si	P	S	Mo	H_{DM} ml/100g
M21	0.065	0.8	0.2	0.014	0.010	0.46	3

Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm²)	Tensile strength (N/mm²)	Elongation (%)	Impact ISO-V (J) +20°C	Impact ISO-V (J) -20°C
Required: AWS A5.29		SR[1]	min. 470	550-690	min. 19	not required	
EN 17634-A		SR[2]	min. 355	min. 510	min.22	47	
Typical values	M21	SR[3]	540	600	27	160	79

Stress relieving: SR[1] = 620 ± 15°C/1h, SR[2] = 570-620°C/1h, SR[3] = 1h/620°C

Packaging and available sizes

Unit type	Diameter (mm) 1.2
15 kg spool B300	X

Materials to be welded

Steel grades/Standard	Type
Creep resistant steels	
EN 10028-2	P295 G H, P355 G H, 16 Mo 3 & similar alloys
EN 10222-2	17 Mo 3, 14 Mo 6 & similar alloys
ASTM A335	Grade P1
ASTM A209	Grade T1
ASTM A250	Grade T1
ASTM A336	Grade F1
ASTM A204	Grade A, B, C
ASTM A217	Grade WC1
ASTM A352	Grade LC1
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	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 passes in shielding gas Ar + (>15 - 25)% CO_2

Diameter (mm)	Welding positions PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G
1.2	230-280A 26-32V	230-280A 26-32V	200-240A 25-32V	200-240A 25-28V	160-220A 23-28V

Remarks/ Application advice

Recommended tempering heat treatment range: 570-630°C
Time depends on material thickness