

Rutile electrode

Classification

AWS A5.1 : E6013
 ISO 2560-A : E 38 0 RC 11

General description

Rutile general purpose, all position electrode, including vertical down
 Soft arc therefore suitable for relative thin plates and bridging wide gaps
 Excellent in pipe welding and construction
 Good start and restart behaviour
 Also weldable with low Open Circuit Voltage transformers (min. OCV 42V)
 Good X-ray soundness

Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PG/3Gdown PE/4G PF/5Gup PG/5Gdown

Current type

AC / DC -

Approvals

TÜV
 +

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

C	Mn	Si
0.09	0.5	0.4

Mechanical properties, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J) 0°C
Required: AWS A5.1		min. 331	min. 414	min. 17	not required
ISO 2560-A		min. 380	470-600	min. 20	min. 47
Typical values	AW	500	540	24	60

Packaging and available sizes

	Diameter (mm)	2.0	2.5	3.2	4.0
	Length (mm)	300	350	350	350
Unit: box	Pieces / unit	235	145	155	120
	Net weight/unit (kg)	2.4	2.8	4.8	5.4

Identification

Imprint: 6013 / PANTAFIX

Tip Color: none

Pantafix: rev. EN 21

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275
Ship plates	
ASTM A 131	Grade A, B, D
Cast steel	
EN 10213-2	G P 240R
Pipe material	
EN 10208-1	L210, L240, L290
EN 10208-2	L240, L290
API 5LX	X42, X46
EN 10216-1/ EN 10217-1	P235, P275
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295
Fine grained steel	
EN 10113-2	S275
EN 10113-3	S275

Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.0 x 300	40 - 75	AC	41	58	0.5	10.4	178	1.98
2.5 x 350	50 - 90	AC	60	130	0.7	17.8	88	1.57
3.2 x 350	70 - 130	AC	66	206	1.0	29.5	53	1.58
4.0 x 350	130 - 175	AC	72	333	1.3	43.6	37	1.61
4.0 x 450	130 - 175							
5.0 x 450	185 - 230							

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PG/3G down	PE/4G
2.5	80A	75A	75A	75A	75A	75A
3.2	120A	115A	125A	115A	125A	115A

Remarks/ Application advice

Vertical down only applicable for "clean" structural steel