

# Rutile electrode

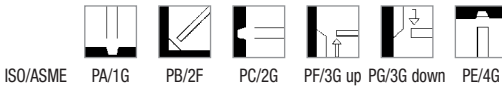
## Classification

AWS A5.1-91 : E6013  
 EN 499-94 : E 42 0 RC 11

## General description

Rutile general purpose, all position electrode, including vertical down  
 Vertical down only applicable for “clean” structural steel  
 Also weldable with low Open Circuit Voltage transformers (min. OCV 42V)

## Welding positions



## Current type

AC / DC electr. -

## Approvals

ABS	BV	CTL	DB	DNV	FORCE	GL	LR	TÜV
2	2	+	+	2	+	2	2	+

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

C	Mn	Si
0.07	0.5	0.5

## Mechanical properties, all weld metal

	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) 0°C
Required: AWS A5.1-91		min. 331	min. 414	min. 17	not required
EN 499-94		min. 420	500-640	min. 20	min. 47
Typical values	AW	520	550	26	60

## Packaging, available sizes and identification

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

Identification Imprint: 6013/Panta

Tip colour: yellow

Panta®: rev. EN 15

## Materials to be welded

Steel	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
	EN 10028-2	P235, P265, P295
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 (s)*	Energy E(kJ)	Dep.rate at max. current - H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 350	70 - 90	AC	47	109	0.84	17.5	90	1.58
3.2 x 350	110 - 130	AC	59	198	1.1	29.5	54	1.58
4.0 x 350	130 - 160	AC	59	301	1.7	42.4	37	1.57

\*stub end 35 mm

## Welding parameters, optimum fill passes

Welding position Diameter (mm)	PA/1G Current (A)	PB/2F	PC/2G	PF/3G up	PG/3G down	PE/4G
2.5	80	75	75	75	75	75
3.2	120	115	125	115	125	115
4.0	175	165	160	160	170	160

## Application advice

Vertical down only applicable for "clean" structural steel