Rutile electrode

Classification

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

General description

Rutile general purpose, all positions electrode
Applicable for "clean" structural steel
Smaller diameters excellent for hobby market
Very suitable for low open circuit voltage transformers

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

ABS	BV	DNV	GL	LR	TÜV
2	2	2	2	2	+

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

C	Mn	Si
0.06	0.5	0.45

Mechanical properties, all weld metal

	Condition	Yield strength (N/mm²)	Tensile strength (N/mm²)	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	430	480	26	60

Packaging and available sizes

	Diameter (mm)	2.0	2.5	3.2	3.2	4.0	4.0
	Length (mm)	300	350	350	450	350	450
Unit: box	Pieces / unit	370	250	175	150	110	95
	Net weight/unit (kg)	4.2	4.8	5.3	6.2	5.0	5.9
Unit: Linc Pack	Pieces / unit	89	54	33		22	
	Net weight/unit (kg)	1.0	1.0	1.0		1.0	

Identification Imprint: 6013-Omnia 46 Tip Color: yellow

Omnia® 46: rev. EN 22

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/	P235, P275
EN 10217-1	
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
2.0x300	50-60	AC	43	57	0.5	11.4	154	1.68
2.5x350	70-90	AC	68	134	0.6	19.2	84	1.60
3.2x350	90-125	AC	80	220	0.9	30.3	50	1.51
3.2x450	100-135	AC	102	303	0.9	41.3	38	1.56
4.0x350	140-190	AC	74	323	1.5	45.5	33	1.49
4.0x450	150-200	AC	95	456	1.5	62.1	26	1.58
5.0x450	180-240	AC	115	662	1.8	105.5	17	1.75

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PG/3G down	PE/4G	PF/5G up	PG/5G down
2.0	55A	55A	55A	50A	55 A		50A	55 A
2,5	80A	85A	85A	80A	85A	85A	80A	85A
3,2	110A	115A	115A	110A	115A	110A	110A	115A
4.0	170A	175A	175A	175A	180A	175A	175A	180A
5.0	220A	230A		230 A				