

Cellulosic electrode

Classification

AWS A5.1 : E6010
 ISO 2560-A : E 42 3 C 25

General description

Cellulosic coated electrode for pipe and general welding
 Gives high ductility root welds
 Very deep penetration ensures sound root pass
 Easy striking, easy slag release
 High volume of generated gas eliminates porosity
 Reduces problems from dirt and oil on surface

Welding positions



ISO/ASME PF/5Gup PG/5Gdown

Current type

DC +

Approvals

LR	TÜV
3	+

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

C	Mn	Si
0.15	0.50	0.25

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
				-20°C	-29°C	-30°C
Required: AWS A5.1	min. 331	min. 414	min. 22	27		
ISO 2560-A	min. 420	500-640	min. 20	47		
Typical values AW	440	520	26	70	65	

Packaging and available sizes

Unit: metal can	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	350	350	350	350
Pieces / unit	325	205	130	83	
Net weight/unit (kg)	5.0	5.2	5.1	5.1	

Identification Imprint: 6010-FW5P+

Tip Color: none

Fleetweld® 5P+: rev. EN 22

Materials to be welded

Steel grades/Code	Type
Pipe material	
EN 10208-1	L 210, L 240
EN 10208-2	L 240 , L 290, L 360
EN 10216-1 / 10217-1	P 235, P 275, P 355
API 5LX	X42, X46, X52
Gaz de France	X42, X46, X52

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
2.5x350	40-70	DC+				15.8		
3.2x350	65-130	DC+				26.2		
4.0x350	90-175	DC+				40.0		
5.0x350	140-225	DC+				61.5		

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PF/5G up	PG/5G down
2.5	55A	65A
3.2	90A	110A
4.0	130A	150A
5.0	150A	165A

Remarks/ Application advice

Preheating pipe material L360 (X52) required (acc. EN 1011-1).

Pipeclamps to be removed after finishing root pass, start welding hot pass (within 5 min) after root pass

Use electrodes directly from metal cans

Rutile electrode

Classification

AWS A5.1 : E6012
 ISO 2560-A : E 38 0 RC 11

General description

All position rutile electrode with excellent vertical down welding properties

Shipbuilding repairs

Excellent on painted or rustcovered steel

Recommended for bridging wide gaps

Weldable in all positions with one current setting

Welding positions



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

Current type

AC / DC -

Approvals

ABS	BV	DNV	GL	LR	RMRS	TÜV
2	2	2	2	2	2	+

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

C	Mn	Si
0.12	0.5	0.6

Mechanical properties, typical, 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	470	550	23	56

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	350	350	350	350
Unit: box	Pieces / unit	145	180	120	80
	Net weight/unit (kg)	2.8	5.0	5.0	5.2

Identification Imprint: 6012 / SUPRA

Tip Color: none

Supra®: 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
Fine grained steel	
EN 10025 part 3	S275
EN 10025 part 4	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
2.5 x 350	70 - 90	AC	47	109	0.8	17.5	90	1.58
3.2 x 350	95 - 130	AC	64	175	1.1	27.6	53	1.45
4.0 x 350	130 - 170	AC	66	330	1.4	41.1	39	1.61
5.0 x 350	170 - 250	AC	77	534	1.8	63.6	26	1.63

* 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	85A	80A	80A	80A	80A	80A
3.2	115A	115A	120A	120A	120A	120A
4.0	155A	170A	155A	160A	180A	155A
5.0	190A	220A			240A	190A

Remarks/ Application advice

Weldable in all positions with one current setting

Rutile electrode

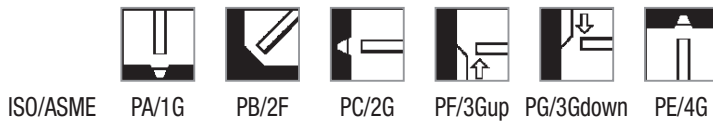
Classification

AWS A5.1 : E6013
 ISO 2560-A : 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 -

Approvals

ABS	BV	DNV	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, typical, 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. 420	500-640	min. 20	min. 47
Typical values AW	520	550	26	60

Packaging and available sizes

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

Identification Imprint: 6013 / PANTA

Tip Color: none

Panta®: 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/ EN 10217-1	P235, P275
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295
Fine grained steel	
EN 10025 part 3	S275
EN 10025 part 4	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
2.5 x 350	70 - 90	AC	47	109	0.8	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 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
4.0	175A	165A	160A	160A	170A	160A

Remarks/ Application advice

Vertical down only applicable for "clean" structural steel

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, typical, 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 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/ EN 10217-1	P235, P275
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295
Fine grained steel	
EN 10025 part 3	S275
EN 10025 part 4	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

Rutile electrode

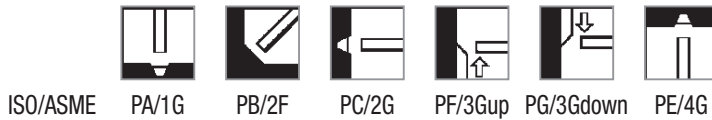
Classification

AWS A5.1 : E6013
 ISO 2560-A : E 42 0 RC 11

General description

Rutile general purpose, all position electrode, including vertical down
 Applicable for “clean” structural steel
 Smaller diameters excellent for hobby market
 Very suitable for low open circuit voltage transformers

Welding positions



Current type

AC / DC -

Approvals

ABS	BV	DNV	GL	LR	RMRS
2	2	2	2	2	2

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

C	Mn	Si
0.07	0.5	0.5

Mechanical properties, typical, 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. 420	500-640	min. 20	min. 47
Typical values	AW	520	550	26	60

Packaging and available sizes

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

Identification

Imprint: 6013 / OMNIA

Tip Color: none

Omnia®: 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/ EN 10217-1	P235, P275
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295
Fine grained steel	
EN 10025 part 3	S275
EN 10025 part 4	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
1.8 x 300	40 - 60	AC	40	38	0.4	8.4	210	1.75
2.5 x 350	65 - 90	AC	52	108	0.8	18.5	85	1.59
3.2 x 350	95 - 130	AC	65	229	1.0	31.1	53	1.67
4.0 x 350	130 - 160	AC	72	333	1.3	43.6	37	1.61
5.0 x 450	170 - 240	AC	106	740	2.1	92.2	16	1.47

* 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
1.8					45A	
2.5	80A	75A	75A	75A	75A	75A
3.2	120A	115A	125A	115A	125A	115A
4.0	175A	165A	160A	160A	170A	160A
5.0	240A	240A			250A	

Remarks/ Application advice

Vertical down only applicable for "clean" structural steel

Rutile electrode

Classification

AWS A5.1 : E6013
 ISO 2560-A : E 42 0 RC 11

General description

Rutile general purpose, all positions electrode
 Applicable for "clean" structural steel (2.5, 3.2, 4.0 mm)
 Smaller diameters excellent for hobby market
 Very suitable for low open circuit voltage transformers (min. OCV 42 V)

Welding positions



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, typical, 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. 420	500-640	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 23

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 10025 part 3	S275
EN 10025 part 4	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

* 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	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				

Rutile electrode

Classification

AWS A5.1 : E6013
 ISO 2560-A : E 42 0 RC 11

General description

Rutile general purpose electrode
Excellent for downhand and vertical up welding; not advised for vertical down welding
Very smooth arc, virtually no spatter
Excellent bead appearance, flat beads and self releasing slag
Very suitable for thin plates

Welding positions



Current type

AC / DC + / -

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

C	Mn	Si
0.08	0.5	0.3

Mechanical properties, typical, 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. 420	500-640	min. 20	min. 47
Typical values	AW	430	480	26	60

Packaging and available sizes

	Diameter (mm)	2.5	3.2
	Length (mm)	350	350
Unit: box	Pieces / unit	250	190
	Net weight/unit (kg)	4.8	5.5

Identification Imprint: 6013

Tip Color: none

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/ EN 10217-1	P235, P275
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295
Fine grained steel	
EN 10025 part 3	S275
EN 10025 part 4	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
2.5x350	60-95	AC	68	134	0.6	19.2	84	1.60
3.2x350	90-135	AC	80	220	0.9	28.9	50	1.51

* 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	PF/5G up	PG/5G down
2,5	80A	85A	85A	80A	85A	85A	80A	85A
3,2	110A	115A	115A	110A	115A	110A	110A	115A

Rutile electrode

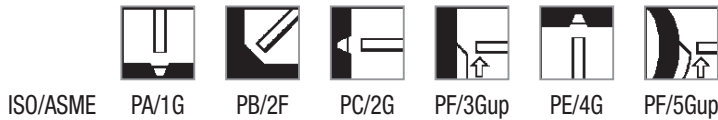
Classification

AWS A5.1 : E6013
 ISO 2560-A : E 38 0 R 12

General description

Rutile, all position electrode (except vertical down)
 Excellent for pipe welding and construction work
 Smooth side wall wetting
 Good X-ray soundness

Welding positions



Current type

AC / DC -

Approvals

ABS	BV	DNV	GL	LR	TÜV
2	2	2	2	2,2Y	+

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

C	Mn	Si
0.1	0.5	0.4

Mechanical properties, typical, 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	25	55

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	350	350	350
Unit: box	Pieces / unit	150	175	115
	Net weight/unit (kg)	2.9	5.2	5.3

Identification Imprint: 6013 / CUMULO

Tip Color: none

Cumulo®: 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/ EN 10217-1	P235, P275
Boiler & pressure vessel steel	
EN 10028-2	P235, P295
Fine grained steel	
EN 10025 part 3	S275
EN 10025 part 4	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
2.5 x 350	65 - 90	AC	52	120	0.8	18.7	86	1.61
3.2 x 350	85 - 130	AC	66	181	1.1	29.7	51	1.53
4.0 x 350	130 - 180	AC	62	345	1.6	46.5	36	1.69

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	95A	85A	85A	75A	75A	75A
3.2	135A	135A	120A	120A	120A	120A
4.0	160A	160A	155A	140A	140A	

Rutile electrode

Classification

AWS A5.1 : E6013
 ISO 2560-A : E 42 0 RR 12

General description

Rutile electrode, especially for down hand welding in structural steel
 Smaller sizes (2.0 & 2.5 mm) most versatile for thin plate material
 Very smooth appearance
 Self releasing slag

Welding positions



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

Current type

AC / DC -

Approvals

ABS	BV	DNV	GL	LR	TÜV
2Y	2Y	2Y	2Y	2Y	+

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

C	Mn	Si
0.1	0.6	0.4

Mechanical properties, typical, 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. 420	500-640	min. 20	min. 47
Typical values	AW	480	560	26	50

Packaging and available sizes

	Diameter (mm)	2.0	2.5	3.2	3.2	4.0
	Length (mm)	300	350	350	450	450
Unit: box	Pieces / unit	200	130	140	125	80
	Net weight/unit (kg)	2.4	2.8	4.8	5.8	5.9

Identification

Imprint: 6013 / UNIVERSALIS

Tip Color: none

Universalis®: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A 131	Grade A, B, D, AH32 to DH36
Cast steel	
EN 10213-2	G P 240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360.
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235, P275
EN 10217-1	P355
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295, P355
Fine grained steel	
EN 10025 part 3	S275, S355
EN 10025 part 4	S275, S355

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 - 65	AC	41	58	0.5	11.4	178	2.00
2.5 x 350	70 - 100	AC	51	134	0.8	21.1	93	1.96
3.2 x 350	100 - 140	AC	57	281	1.3	39.3	47	1.85
3.2 x 450	100 - 140	AC	69	341	1.5	49.6	36	1.79
4.0 x 450	150 - 200	AC	69	483	2.1	66.9	25	1.67

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PE/4G
2.0	50A			
2.5	100A	95A	85A	85A
3.2	130A	120A	115A	105A
4.0	185A	185A	160A	130A
5.0	260A	260A		

Remarks/ Application advice

Best choice for welding thin plates.

High yield strength steels such as S355, L360, P355 and X60 preheat according EN 1011-1

Ferrod 165A

High recovery rutile electrode

Classification

AWS A5.1 : E7024-1
ISO 2560-A : E 42 2 RA 73

General description

Rutile coated electrode with brittle slag, for fillet welds and horizontal V- and X-welds

160% recovery, high welding speed

Good X-ray soundness

Even in narrow gaps and rusty materials easy slag release

Class 3 approved

Welding positions



ISO/ASME PA/1G PB/2F PC/2G

Current type

AC / DC + / -

Approvals

ABS	DNV	GL	LR	TÜV
3,3Y	3	3	3,3Y	+

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

C	Mn	Si
0.07	0.95	0.3

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-10°C	-18°C	-20°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27	
ISO 2560-A		min. 420	500-640	min. 20			min. 47
Typical values	AW	475	520	26	70		67

Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0
	Length (mm)	450	450	450
Unit: box	Pieces / unit	99	60	41
	Net weight/unit (kg)	6.1	5.6	6.0

Identification

Imprint: 7024-1 / FERROD 165A

Tip Color: none

Ferrod 165A: rev. EN 22

Ferrod 165A

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A 131	Grade A, B, D, AH32 to DH36
Cast steel	
EN 10213-2	G P 240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360.
API 5LX	X42, X46, X52
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295
Fine grained steel	
EN 10025 part 3	S275, S355
EN 10025 part 4	S275, S355

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
3.2 x 450	125 - 155	AC	75	326	1.9	62.9	25	1.39
4.0 x 450	140 - 235	AC	65	527	3.6	96.5	15	1.39
5.0 x 450	210 - 330	AC	68	853	5.3	144.9	10	1.39

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G
3.2	160A	150A	150A
4.0	220A	200A	195A
5.0	310A	290A	

Remarks/ Application advice

High yield strength steels such as S355, L360, P355 and DH36 preheat according EN 1011-1

Ferrod 135T

High recovery rutile electrode

Classification

AWS A5.1 : E7024
ISO 2560-A : E 38 0 RR 53

General description

Rutile electrode for fillet welds and horizontal V- and X-welds

High welding speed

Smooth weld appearance

Self releasing slag

High recovery (140%)

Welding positions



ISO/ASME PA/1G PB/2F PC/2G

Current type

AC / DC -

Approvals

ABS	BV	DNV	GL	LR	RMRS	TÜV
2Y	2Y	2Y	2Y	2Y	2Y	+

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

C	Mn	Si
0.08	0.5	0.35

Mechanical properties, typical, 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. 400	min. 483	min. 17	not required
ISO 2560-A		min. 380	470-600	min. 20	47
Typical values	AW	460	530	25	54

Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0
	Length (mm)	450	450	450
Unit: box	Pieces / unit	90	65	45
	Net weight/unit (kg)	5.5	5.7	5.9

Identification

Imprint: 7024 / FERROD 135T

Tip Color: none

Ferrod 135T: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to DH36
Cast steel	
EN 10213-2	G P 240R
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295, P355
Fine grained steel	
EN 10025 part 3	S275, S355
EN 10025 part 4	S275, S355

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
3.2 x 450	130 - 150	AC	85	344	1.6	61.3	27	1.67
4.0 x 450	180 - 200	AC	92	515	2.2	87.7	18	1.67
5.0 x 450	275 - 300	AC	86	735	3.7	129.9	11	1.43

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G
3.2	150A	140A	140A
4.0	200A	190A	190A
5.0	290A	280A	

Remarks/ Application advice

High yield strength steels such as S355, L360, P355 and DH36 preheat according EN 1011-1

Ferrod 160T

High recovery rutile electrode

Classification

AWS A5.1 : E7024
 ISO 2560-A : E 42 0 RR 73

General description

Rutile electrode for fillet welds and horizontal V- and X-welds
 Very high welding speed
 Smooth weld appearance, very good slag release
 High recovery (160% for 3.2 and 4.0 mm electrodes, and 180% for 5.0 mm electrodes)

Welding positions



ISO/ASME PA/1G PB/2F PC/2G

Current type

AC / DC -

Approvals

ABS	BV	DNV	GL	LR	TÜV
2Y	2Y	2Y	2Y	2Y	+

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

C	Mn	Si
0.07	0.9	0.6

Mechanical properties, typical, 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. 400	min. 483	min. 17	not required
ISO 2560-A		min. 420	500-640	min. 20	min. 47
Typical values	AW	450	570	26	70

Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0	6.0
	Length (mm)	450	450	450	450
Unit: box	Pieces / unit	85	60	35	30
	Net weight/unit (kg)	6.4	6.3	5.8	6.5

Identification

Imprint: 7024 / FERROD 160T

Tip Color: none

Ferrod 160T: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to DH36
Cast steel	
EN 10213-2	G P 240R
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295, P355
Fine grained steel	
EN 10025 part 3	S275, S355
EN 10025 part 4	S275, S355

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
3.2 x 450	130 - 160							
4.0 x 450	180 - 220	AC	90	554	2.6	92.7	15	1.43
5.0 x 450	280 - 300	AC	78	897	5.4	166.7	9	1.43

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F
3.2	150A	140A
4.0	210A	200A
5.0	300A	280A

Remarks/ Application advice

High yield strength steels such as S355, L360, P355 and DH36 preheat according EN 1011-1

High recovery rutile electrode

Classification

AWS A5.1 : E7024
ISO 2560-A : E 42 0 RR 73

General description

Rutile electrode for fillet welds and horizontal V- and X-welds

190% recovery

Very high welding speed

Smooth weld appearance

Self releasing slag

Welding positions



ISO/ASME PA/1G PB/2F PC/2G

Current type

AC / DC -

Approvals

ABS	BV	CRS	DNV	GL	LR	RINA	RMRS
2	2Y	2Y	2	2Y	2	2	2

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

C	Mn	Si
0.07	1.0	0.35

Mechanical properties, typical, 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. 399	min. 482	min. 17	not required
ISO 2560-A		min. 420	500-640	min. 20	min. 47
Typical values	AW	450	525	27	75

Packaging and available sizes

	Diameter (mm)	4.0	5.0	6.3
	Length (mm)	450	450	450
Unit: box	Pieces / unit	55	35	23
	Net weight/unit (kg)	5.8	5.8	5.7

Identification Imprint: 7024 / GONIA 180

Tip Color: blue

Gonia 180: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to DH36
Boiler & pressure vessel steel	
EN 10028-2	P235, P265, P295, P355
Fine grained steel	
EN 10025 part 3	S275, S355
EN 10025 part 4	S275, S355

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
4.0 x 450	200 - 240	AC	78	515	3.4	100.0	14	1.35
5.0 x 450	280 - 300	AC	85	816	4.9	157.7	9	1.35
6.3 x 450	350 - 375	AC	102	1320	6.5	248.0	6	1.35

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G
4.0	210A	200A	200A
5.0	300A	280A	
6.3	390A	360A	

Remarks/ Application advice

High yield strength steels such as S355, L360, P355 and DH36 preheat according EN 1011-1

Basic electrode

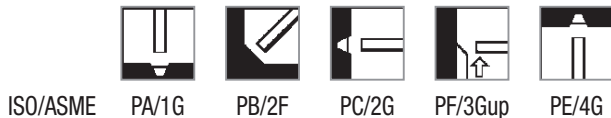
Classification

AWS A5.1 : E7018-1 H8
 ISO 2560-A : E 46 3 B 32 H10*
 * also complies to E 46 3 BR 32 H10

General description

Rutile basic coated electrode with excellent start- and restart properties
 Weldable on AC and DC
 Stable arc, also at low amperage
 Popular at welding schools
 Min. 60 Volt is recommended
 Good mechanical and impact properties down to -30°C (47 J)
 Low hydrogen content ($H_{DM} < 8$ ml/100g)

Welding positions



Current type

∅ 2.5 AC / DC + / -
 ∅ 3.2 AC / DC +
 ∅ 4.0 AC / DC +
 ∅ 5.0 AC / DC +

Approvals

ABS	BV	DNV	LR	TÜV
3YH10	HHH	3YH5	3,3YH10	+

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

C	Mn	Si	H _{DM}
0.075	1.4	0.65	7 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-20°C	-30°C	-46°C
Required: AWS A5.1		min. 400	min. 483	min. 22			min. 27
ISO 2560-A		min. 460	530-680	min. 20		min. 47	
Typical values	AW	590	640	25	90	60	

Packaging and available sizes

	Diameter (mm)	2.5	3.2	3.2	4.0	4.0	5.0
	Length (mm)	350	350	450	350	450	450
Unit: box	Pieces / unit	125	78	78	50	50	50
	Net weight/unit (kg)	2.5	2.6	3.3	2.5	3.4	5.5
Unit: SRP	Pieces / unit	44	51	-	27	-	-
	Net weight/unit (kg)	0.9	1.8	-	1.4	-	-

Identification

Imprint: 7018-1 / BASO 48SP

Tip Color: green

Baso[®] 48 SP: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH36.
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420, S460

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
2.5 x 350	50 - 85	AC	48	104	0.9	19.4	82	1.6
3.2 x 450	85 - 135	AC	75	273	1.1	41.0	42	1.72
4.0 x 450	135 - 190	AC	95	487	1.6	64.6	24	1.55

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G
2.5	80A	85A	85A	85A	80A
3.2	120A	115A	115A	115A	110A
4.0	170A	180A	180A	180A	160A

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

Classification

AWS A5.1 : E7018 H4
 ISO 2560-A : E 46 3 B 32 H5

General description

Basic very low hydrogen electrode ($H_{DM} < 5 \text{ ml/100g}$)
 Very good weldability, in all positions
 Almost no spatter, nice wetting and full weld pool control
 Good impact values down to -30°C
 Excellent X-ray soundness

Welding positions



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

Current type

DC + / -

Approvals

ABS	BV	DNV	GL	LR	RINA	TÜV
3H, 3Y	3, 3YHH	3YH5	3YH	3, 3YH5	3YH5	+

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

C	Mn	Si	H_{DM}
0.09	1.1	0.6	5 ml/100

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
				-20 °C	-29 °C	-30 °C	-40 °C
Required: AWS A5.1 ISO 2560-A	min. 400 min. 460	min. 483 530-680	min. 22 min. 20		min. 27		min. 47
Typical values AW	550	635	25	115		85	65

Packaging and available sizes

	Diameter (mm)	2.5	3.2	3.2	4.0	4.0	5.0
	Length (mm)	350	350	450	350	450	450
Unit: box	Pieces / unit	175	115	115	85	85	55
	Net weight/unit (kg)	3.9	4.0	5.2	4.6	5.7	6.0

Identification Imprint: 7018 / BASO 49

Tip Color: none

Baso[®] 49: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type (s)*	Arc time - per electrode at max. current - E(kJ)	Energy H(kg/h)	Dep.rate (kg)	Weight/ 1000 pcs. B	Electrodes/ kg weldmetal 1/N	kg Electrodes/ kg weldmetal
2.5 x 350	70 - 80	DC+	58	120	0.85	23.1	73	1.7
3.2 x 350	110 - 130	DC+	68	194	1.3	36.8	41	1.5
4.0 x 450	140 - 180	DC+	98	429	1.8	69.5	20	1.4
5.0 x 450	160 - 240	DC+	117	619	2.3	107.3	13	1.4

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G
2.5	95A	95A	90A	90A	85A
3.2	140A	130A	130A	120A	120A
4.0	180A	180A	180A	160A	150A
5.0	230A	230A	230A	180A	

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

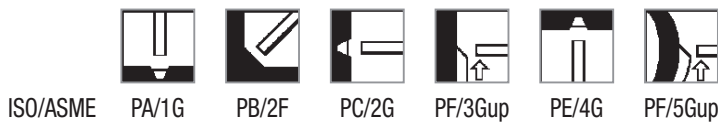
Classification

AWS A5.1 : E7018-1
 ISO 2560-A : E 46 3 B 32 H5

General description

Basic low hydrogen electrode
 Excellent for tube welding and root passes
 Very good weldability, in all positions
 Stable arc, also at low amperage
 Easy puddle control and wetting
 Good slag release and flat bead appearance
 Good mechanical and impact properties down to -30°C
 Excellent X-ray soundness

Welding positions



Current type

AC / DC + / -

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

C	Mn	Si	P	S	H _{DM}
0.06	1.3	0.5	0.015	0.01	5 ml/100 g

Mechanical properties, typical, all weld metal

Condition	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
				-20 °C	-30 °C	-46°C
Required: AWS A5.1	min. 400	min. 483	min. 22			min. 27
ISO 2560-A	min. 460	530-680	min. 20		min. 47	
Typical values AW	510	600	27	90	70	40

Packaging and available sizes

	Diameter (mm)	2.5	3.2	3.2	4.0	4.0	5.0
Length (mm)		350	350	450	350	450	450
Unit: box	Pieces / unit	215	130	120	80	80	55
	Net weight/unit (kg)	4.2	4.2	5.1	4.0	5.2	5.5

Identification Imprint: 7018-1 / BASO 51P

Tip Color: none

Baso[®] 51P: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420, S460

Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type (s)*	Arc time - per electrode at max. current - E(kJ)	Energy H(kg/h)	Dep.rate (kg)	Weight/ 1000 pcs. B	Electrodes/ kg weldmetal 1/N	kg Electrodes/ kg weldmetal
2.5 x 350	50 - 100	DC+	48	104	0.9	19.4	82	1.6
3.2 x 450	75 - 140	DC+	75	273	1.1	41.0	42	1.72
4.0 x 450	140 - 190	DC+	95	487	1.6	64.6	24	1.55
5.0 x 450	180 - 280	DC+						

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	5G
2.5	90A	90A	80A	85A	80A	85A
3.2	130A	130A	130A	115A	110A	115A
4.0	180A	175A	170A	160A		
5.0	230A	240A	230A			

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

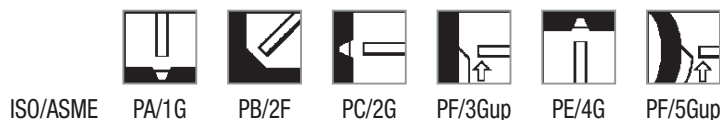
Classification

AWS A5.1 : E7016 H4R
ISO 2560-A : E 42 3 B 12 H5

General description

Basic very low hydrogen electrode ($H_{DM} < 5 \text{ ml/100g}$)
Excellent for general purpose welding
Will run on low open circuit voltage (min. OCV 55 V)
Good side wall wetting
Impact toughness at -20°C
Popular at welding schools

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	TÜV
3H,3Y	3,3YHH	3YH5	3YH10	3,3YH5	+

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

C	Mn	Si	H _{DM}
0.08	1.0	0.5	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-20°C	-30°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27
ISO 2560-A		min. 420	500-640	min. 20		min. 47
Typical values	AW	555	600	26	120	80

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	350	350	350	450
Unit: box	Pieces / unit	135	120	90	65
	Net weight/unit (kg)	2.5	4.3	4.8	6.3

Identification

Imprint: 7016 / BASO 100

Tip Color: Light blue

Baso® 100: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH36.
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P274T1, P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420,
EN 10025 part 4	S275, S355, S420, S460

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
2.5 x 350	55 - 80	AC	53	116	0.8	19.1	85	1.63
3.2 x 350	75 - 115	AC	62	229	1.2	36.1	50	1.81
4.0 x 350	120 - 160	AC	64	337	1.6	50.1	34	1.72
5.0 x 450	160 - 240	AC	91	578	2.4	96.7	16	1.58
5.0 x 450	160 - 240	DC+	93	591	2.6	96.7	15	1.44

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	5G
2.5	80A	80A	80A	90A	85A	85A
3.2	130A	125A	140A	120A	115A	120A
4.0	165A	160A	165A	150A	140A	
5.0	230A	220A	210A	200A		

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

Classification

AWS A5.1 : E7018 H4R
ISO 2560-A : E 42 3 B 32 H5

General description

Basic very low hydrogen electrode ($H_{DM} < 4\text{ml}/100\text{g}$)
Recovery 120%
Excellent weldability even on AC in all positions
Good impact values at -30°C
Excellent X-ray soundness

Welding positions



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

Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	TÜV
3H,3Y	3,3YH	3YH5	3YH	3,3YH5	+

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

C	Mn	Si	H _{DM}
0.08	1.2	0.5	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-20°C	-30°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27
ISO 2560-A		min. 420	500-640	min. 20		min. 47
Typical values	AW	540	600	26	150	80

Packaging and available sizes

	Diameter (mm)	2.5	3.2	3.2	4.0	4.0	5.0
	Length (mm)	350	350	450	350	450	450
Unit: box	Pieces / unit	135	120	120	85	85	55
	Net weight/unit (kg)	2.5	4.5	6.0	4.6	5.9	6.0

Identification

Imprint: 7018 / BASO 120

Tip Color: silver

Baso® 120: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH36.
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
2.5 x 350	60 - 80	AC	55	121	0.8	19.1	85	1.61
3.2 x 350	90 - 140	AC	62	229	1.3	37.1	44	1.64
3.2 x 450	90 - 140	AC	74	275	1.5	50.1	33	1.67
4.0 x 350	120 - 160	AC	63	338	1.8	54.4	32	1.72
4.0 x 450	120 - 160	DC+	85	391	1.9	69.5	22	1.52
5.0 x 450	160 - 240	AC	99	616	2.6	108.8	14	1.54
5.0 x 450	160 - 240	DC+	100	625	2.6	108.8	14	1.52

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	1 G	PB/2F	PC/2G	PF/3G up	PE/4G
2.5	80A	80A	85A	85A	80A
3.2	145A	120A	140A	120A	125A
4.0	175A	155A	170A	165A	145A
5.0	235A	220A	210A	195A	

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

Classification

AWS A5.1 : E7018 H8
ISO 2560-A : E 42 4 B 4 2 H5

General description

Electrode producing crack-free welded joints with good toughness properties even on steels with a carbon content up to 0,4 %.

Recovery 120%

Excellent weldability even in positional welding

Good impact values at -40°C

Suitable for depositing buffer layers on steels having a higher carbon content

Welding positions



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

Current type

DC +

Approvals

BV	DNV	LR	RINA
3YHH	3YH10	3YH10	3YH10

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

C	Mn	Si	H ₂ O
0.05	1.3	0.4	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-46°C	-40°C
Required: AWS A5.1		min. 400	min. 483	min. 22	min. 27	
ISO 2560-A		min. 420	500-640	min. 20	min. 47	
Typical values	AW	520	580	27	150	105

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	350	450	450	450
Unit: box	Pieces / unit	180	120	85	55
	Net weight/unit (kg)	4.4	5.9	6.0	5.9

Identification Imprint: 7018 / BASIC ONE

Tip Color:

Basic ONE: rev. EN 01

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH36.
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

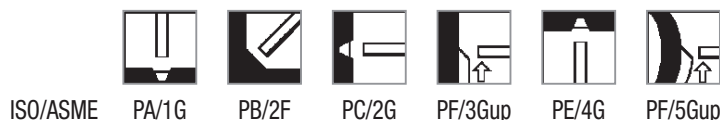
Classification

AWS A5.1 : E7018-1 H4R
ISO 2560-A : E 42 5 B 32 H5

General description

Basic all position extremely low hydrogen electrode
115 - 120% recovery
AC/DC welding in all positions especially pipe
Excellent for site welding applications
Good pipe welding
Good impact values at -50°C
Also available in vacuum sealed Sahara ReadyPack® (SRP)

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RINA	RMRS	TÜV
3H,3Y	3,3YH	3YH5	3YH10	3,3YH5	4YH5	3-3YH5	+

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

C	Mn	Si	H _{bM}
0.05	1.3	0.4	2 ml/100 g

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
				-20°C	-40°C	-46°C	-50°C
Required: AWS A5.1	min. 400	min. 483	min. 22			min. 27	
ISO 2560-A	min. 420	500-640	min. 20				min. 47
Typical values	AW 490	575	28	200	130		100

Packaging and available sizes

	Diameter (mm)	2.0	2.5	3.2	3.2	4.0	4.0	5.0
	Length (mm)	300	350	350	450	350	450	450
Unit: box	Pieces / unit	180	135	120	120	85	85	55
	Net weight/unit (kg)	2.1	2.8	4.4	5.8	4.7	5.9	6.0
Unit: SRP	Pieces / unit	53	69	50	50	28	28	23
	Net weight/unit (kg)	0.6	1.4	2.0	2.5	1.6	2.0	2.6

Identification

Imprint: 7018-1 / BASO G

Tip Color: blue

Baso® G: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420,

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	35 - 55	DC+	50	61	0.5	11.7	149	1.75
2.5 x 350	55 - 90	DC+	59	107	0.8	20.3	78	1.59
3.2 x 350	75 - 120	DC+	70	234	1.2	36.5	42	1.54
3.2 x 450	75 - 120	DC+	79	265	1.4	45.4	33	1.47
4.0 x 350	120 - 180	DC+	75	358	1.7	50.9	28	1.45
4.0 x 450	120 - 180	DC+	96	473	1.7	69.3	22	1.52
5.0 x 450	160 - 240	DC+	114	671	2.2	106.2	14	1.54

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	5G
2.0						45A
2.5	80A	80A	85A	90A	80A	80A
3.2	145A	120A	150A	120A	115A	120A
4.0	160A	145A	170A	150A	145A	145A
5.0	220A	210A	215A	170A		

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

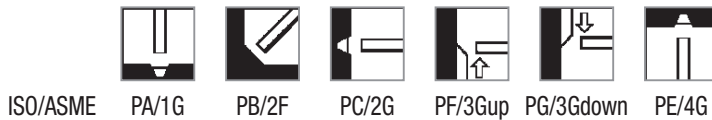
Classification

AWS A5.1 : E 7048 H8
 ISO 2560-A : E 42 3 B 15 H10

General description

Basic low hydrogen electrode
Specially developed for vertical down welding on shipyards
Complete fusion in open root passes
Good tack weldability
Good slag removal, smooth bead appearance

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RMRS
3Y	3Y	3YH10	3YH10	3,3YH10	3-3YH10

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

C	Mn	Si	H _{DM}
0.09	1.1	0.7	6 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-20°C	-29°C	-30°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27	
ISO 2560-A		min. 420	500-640	min. 20			min. 47
Typical values	AW	580	630	26	130		

Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0
	Length (mm)	350	450	450
Unit: box	Pieces / unit	150	100	70
	Net weight/unit (kg)	6.1	6.2	6.7
Unit: SRP	Pieces / unit	-	33	26
	Net weight/unit (kg)	-	2.0	2.5

Identification Imprint: 7048 / BASO 26V

Tip Color: dark green

Baso[®] 26V: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH36.
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
3.2 x 350	110 - 140	DC+	51	181	1.5	34.0	48	1.62
4.0 x 450	155 - 185	DC+	70	315	2.1	59.7	24	1.44
5.0 x 450	195 - 225	DC+	86	435	2.7	92.9	15	1.43

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PG/3G down
3.2	130A	130A
4.0	145A	175A
5.0	220A	220A

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

Classification

AWS A5.1 : E7018-1 H4R
ISO 2560-A : E 46 4 B 42 H5

General description

Basic very low hydrogen electrode ($H_{DM} < 5 \text{ ml/100g}$)

Recovery 130%

Excellent weldability on DC+ in all positions, especially overhead and vertical up

Excellent impact toughness down to -40°C

Excellent X-ray soundness

Welding positions



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

Current type

DC +

Approvals

DNV
4YH5

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

C	Mn	Si	H_{DM}
0.05	1.3	0.3	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-40°C	-46°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27
ISO 2560-A		min. 460	530-680	min. 20	min. 47	
Typical values	AW	470	570	27	103	80

Packaging and available sizes

	Diameter (mm)	2.0				2.5		3.2	
		3.2	4.0	4.0	5.0	3.2	4.0	4.0	5.0
	Length (mm)	300	350	350	450	350	450	450	
Unit: box	Pieces / unit	146	110	126	110	95	82	58	
	Net weight/unit (kg)	1.9	2.5	5.0	5.7	5.4	6.0	6.3	

Identification

Imprint: 7018-1 / CONARC 48

Tip Color: orange

Conarc® 48: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275, S355, S420, S460

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	50 - 80	DC+	53		0.6	14.3	123	1.76
2.5 x 350	80 - 110	DC+	64		0.8	23.1	67	1.55
3.2 x 350	95 - 150	DC+	67		1.3	40.0	40	1.60
3.2 x 450	95 - 150	DC+	-		-	-	-	-
4.0 x 350	125 - 210	DC+	83		1.7	57.6	26	1.50
4.0 x 450	125 - 210	DC+	95		1.8	73.4	21	1.54
5.0 x 450	190 - 270							

* stub end 35 mm

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

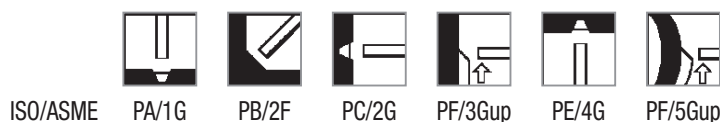
Classification

AWS A5.1 : E7018 H4R
ISO 2560-A : E 46 3 B 32 H5

General description

Basic very low hydrogen electrode ($H_{DM} < 5 \text{ ml/100g}$)
Most suitable universal basic electrode for shipbuilding and light general construction work
Welding characteristics come very close to the welders ideal electrode
Almost no spatter, nice wetting and full weld pool control
One current setting for all positions possible
Perfect welding and 120% recovery contributes to high productivity

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RINA	RMRS	TÜV
3H,3Y	3,3YHH	3YH5	3YH10	3,3YH5	3YH5	3-3YH5	+

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

C	Mn	Si	P	S	H_{DM}
0.09	1.1	0.6	0.015	0.010	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
					-20°C	-29°C	-30°C	-40°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27		
ISO 2560-A		min. 460	530-680	min. 20			min. 47	
Typical values	AW	480	560	28	140		120	80

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0	4.0	5.0	6.0
	Length (mm)	350	350	350	450	450	450
Unit: box	Pieces / unit	118	120	85	85	55	46
	Net weight/unit (kg)	2.7	4.5	4.6	5.9	6.0	6.5
Unit: Linc Pack	Pieces / unit	44	27	18	-	-	-
	Net weight/unit (kg)	1.0	1.0	1.0	-	-	-

Identification Imprint: 7018 / CONARC 49

Tip Color: green

Conarc® 49: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275, S355, S420, S460

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
2.5 x 350	70 - 80	DC+	58	120	0.85	23.1	73	1.7
3.2 x 350	110 - 130	DC+	68	194	1.3	36.8	41	1.5
4.0 x 450	140 - 180	DC+	98	429	1.8	69.5	20	1.4
5.0 x 450	160 - 240	DC+	117	619	2.3	107.3	13	1.4
6.0 x 450	250 - 300	DC+	106	976	3.5	136.9	10	1.33

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	95A	95A	90A	90A	85A	85A
3.2	140A	130A	130A	120A	120A	110A
4.0	180A	180A	180A	160A	150A	160A
5.0	230A	230A	230A	180A		
6.0	300A	290A				

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

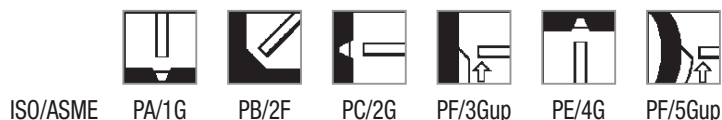
Classification

AWS A5.1 : E7018-1 H4R
ISO 2560-A : E 46 4 B 32 H5

General description

Basic extremely low hydrogen electrode
Reliable impact toughness -40°C, good CTOD at -10°C
The off-shore electrode when Ni-alloying is not allowed
100 - 120% recovery
Good pipe welding properties
Excellent X-ray soundness
Also available in vacuum sealed Sahara ReadyPack® (SRP)

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RMRS	TÜV
3H,3Y	3YHH	3YH5	3YH10	3,3YH5	3-3YH5	+

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

C	Mn	Si	P	S	H _{DM}
0.06	1.4	0.3	0.015	0.010	2 ml/100 g

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
				-20°C	-40°C	-50°C
Required: AWS A5.1	min. 400	min. 483	min. 22			min. 27
ISO 2560-A	min. 460	530-680	min. 20		min. 47	
Typical values AW	480	580	28	200	170	100
CTOD value at -10°C > 0.25 mm						

Packaging and available sizes

	Diameter (mm)	2.5	3.0	3.2	3.2	4.0	4.0	5.0	6.0
	Length (mm)	350	350	350	450	350	450	450	450
Unit: box	Pieces / unit	135	80	120	120	85	85	55	46
	Net weight/unit (kg)	2.7	2.4	4.2	5.8	4.5	5.7	6.0	6.5
Unit: SRP	Pieces / unit	70	54	50	50	28	28	23	21
	Net weight/unit (kg)	1.4	1.5	2.0	2.5	1.6	2.0	2.6	3.0

Identification	Imprint: 7018-1 / CONARC 49C	Tip Color: grey	Conarc® 49C: rev. EN 23
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Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275, S355, S420, S460

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
2.5 x 350	55 - 80	DC+	55	99	0.78	19.6	84	1.65
3.0 x 350	70 - 110	DC+	53	193	1.2	30.4	58	1.77
3.2 x 350	80 - 130	DC+	65	217	1.2	37.9	45	1.69
4.0 x 350	120 - 160	DC+	75	348	1.6	54.2	30	1.61
4.0 x 450	120 - 160	DC+	100	444	1.7	70.4	21	1.47
5.0 x 450	180 - 240	DC+	90	632	2.6	105.6	15	1.60
6.0 x 450	250 - 330	DC+	106	976	3.5	136.9	10	1.33

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	80A	80A	80A	85A	80A	80A
3.0	110A	110A	115A	110A	105A	110A
3.2	140A	120A	145A	120A	120A	120A
4.0	150A	140A	150A	140A	135A	140A
5.0	220A	210A	210A	170A		
6.0	300A	290A				

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C
Best choice: 3.0 x 350 mm for rootlayer welding in pipes

Basic electrode

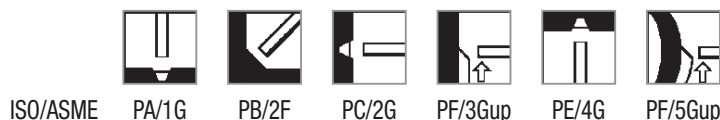
Classification

AWS A5.1 : E7018-1 H4R
ISO 2560-A : E 42 5 B 32 H5

General description

Basic extremely low hydrogen electrode
Reliable impact toughness -40°C, good CTOD at -10°C
The off-shore electrode when Ni-alloying is not allowed
115 - 120% recovery
Good pipe welding properties
Excellent X-ray soundness
Also available in vacuum sealed Sahara ReadyPack® (SRP)

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RINA	RMRS	TÜV
3H,3Y	3,YHH	3YH5	3YH10	3,3YH5	4YH5	3-3YH5	+

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

C	Mn	Si	H _{bM}
0.05	1.3	0.4	3 ml/100 g

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
				-20°C	-40°C	-46°C	-50°C
Required: AWS A5.1	min. 400	min. 483	min. 22				min. 27
ISO 2560-A	min. 420	500-640	min. 20			min. 47	
Typical values AW	490	575	28	200	130		100
CTOD value at -10°C > 0.25 mm							

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	350	450	450	450
Unit: box	Pieces / unit	110	120	85	55
	Net weight/unit (kg)	7.5	7.7	8.3	8.2
Unit: SRP	Pieces / unit	60	50	28	23
	Net weight/unit (kg)	1.4	2.5	2.0	2.5

Identification	Imprint: 7018-1 / CONARC ONE	Tip Color: blue	Conarc® ONE: rev. EN 01
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Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420, S460
EN 10025 part 4	S275, S355, S420, S460

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
2.5 x 350	60 - 100	DC+	60	138	0.83	23.1	72	1.67
3.2 x 350	90 - 145	DC+	93	337	1.27	50.8	30	1.54
4.0 x 450	110 - 160	DC+	103	464	1.65	71.2	21	1.52
5.0 x 450	160 - 250	DC+	177	717	2.24	108.8	14	1.49

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	90A	90A	85A	90A	85A	80A
3.2	140A	140A	150A	120A	115A	120A
4.0	175A	175A	170A	150A	145A	145A
5.0	230A	230A	215A	170A		

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

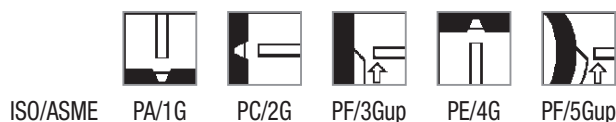
Classification

AWS A5.1 : E7016-1 H4R
ISO 2560-A : E 42 4 B 12 H5

General description

Basic extremely low hydrogen electrode
Good impact values at -40 °C
Good CTOD at -10°C, meets offshore requirements
Excellent root pass electrode (diam. 2.5 and 3.2 mm)
Also available in vacuum sealed Sahara ReadyPack® (SRP): H_{DM} < 3 ml/100g

Welding positions



Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	TÜV
3H,3Y	3,3YHH	3YH5	3YH10	3,3YH5	+

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

C	Mn	Si	P	S	H _{DM}
0.06	1.4	0.5	0.015	0.010	2 ml/100 g

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
				-20°C	-40°C	-46°C
Required: AWS A5.1	min. 400	min. 483	min. 22			min. 27
ISO 2560-A	min. 420	500-640	min. 20		min. 47	
Typical values CTOD value at -10°C > 0.25 mm	AW 520	575	28	115	80	60

Packaging and available sizes

	Diameter (mm)	2.5	3.2	3.2	4.0	4.0	5.0
	Length (mm)	350	350	450	350	450	450
Unit: box	Pieces / unit	135	150	151	100	96	55
	Net weight/unit (kg)	2.7	4.7	6.0	4.6	6.0	6.0
Unit: SRP	Pieces / unit	70	56	56	30	30	23
	Net weight/unit (kg)	1.4	1.8	2.3	1.4	1.8	2.6

Identification Imprint: 7016-1 / CONARC 51

Tip Color: gold

Conarc® 51: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
2.5 x 350	40 - 80	DC+	53	123	0.8	19.6	86	1.68
3.2 x 350	70 - 120	DC+	62	178	1.0	30.8	57	1.74
3.2 x 450	70 - 120							
4.0 x 350	100 - 160	DC+	71	306	1.4	48.0	37	1.78
4.0 x 450	100 - 160							
5.0 x 450	180 - 240	DC+	104	702	2.6	103.0	13	1.36

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	75A	70A	75A	70A	75A
3.2	100A	110A	100A	100A	100A
4.0	150A	140A	130A	125A	125A
5.0	220A	220A	180A		

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

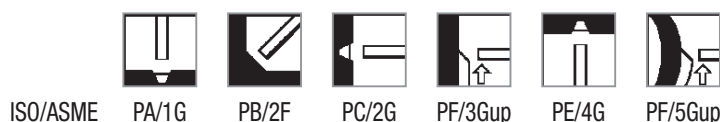
Classification

AWS A5.1 : E7016 H4
ISO 2560-A : E 42 3 B 12 H5

General description

Designed for vertical up root pass welding of pipes up to and including X80 and similar steel
Suitable for fill and cap pass welding for up to and including X65
Excellent low temperature impact properties down to -30°C
Good directed arc even at very low current makes welding easier, especially in critical pipe welding applications
Superior crack resistance, excellent stability in all welding positions
Open gap root pass welding with 2.5 and 3.2 mm electrodes using DC - / + polarity

Welding positions



Current type

AC / DC + / -

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

C	Mn	Si	P	S	H _{DM}
0.06	1.2	0.4	0.010	0.02	2 ml/100 g

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
				-20°C	-30°C
Required: AWS A5.1	min. 400	min. 480	min. 22	27	
ISO 2560-A	min. 420	500-640	min. 20		min. 47
Typical values AW	480	590	28	140	125
CTOD value at -10°C > 0.25 mm					

Packaging and available sizes

Unit: box	Diameter (mm)	2.5	3.2	4.0	4.0
	Length (mm)	350	350	350	450
Pieces / unit	148	157	87	82	
Net weight/unit (kg)	2.7	4.8	4.4	5.1	

Identification Imprint: 7016-1 / CONARC 52

Tip Color: black

Conarc® 52: rev. EN 02

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N, P420N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH, P420GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
2.5 x 350	50 - 80	DC+	59	100,6	0.71	18.5	86	1.59
3.2 x 350	60 - 120	DC+	68	179,9	1.02	30.3	52	1.57
4.0 x 350	120 - 170	DC+	77	258,7	1.50	48.7	31	1.51

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	85A	85A	85A	75A	85A	75A
3.2	120A	115A	115A	115A	115A	115A
4.0	170A	170A	170A	140A	140A	140A

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

Classification

AWS A5.1 : E7016-1
ISO 2560-A : E 42 5 B 12 H5

General description

Basic extremely low hydrogen electrode
Good impact values at -50°C
Excellent root pass electrode (diameters 2,5 & 3,2 mm) on pipe

Welding positions



ISO/ASME PA/1G PC/2G PF/3Gup PE/4G PF/5Gup

Current type

AC / DC + / -

Approvals

NAKS
Pending

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

C	Mn	Si	P	S	H _{DM}
0.06	1.3	0.4	0.010	0.010	3 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-20°C	-46°C	-50°C
Required: AWS A5.1		min. 400	min. 490	min. 22		min. 27	
ISO 2560-A		min. 420	500-640	min. 20			min. 47
Typical values	AW	520	575	28	120	70	60

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	350	350	350
Unit: box	Pieces / unit	132	158	80
	Net weight/unit (kg)	2.5	4.9	5.9

Identification

Imprint: 7016-1 / CONARC 53

Tip Color: blue

Conarc® 53: rev. EN 01

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60, X65
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N, P420N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
2.5 x 350	40 - 80	DC+	53	123	0.8	19.6	86	1.68
3.2 x 350	70 - 120	DC+	62	178	1.0	30.8	57	1.74
4.0 x 350	100 - 160							

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	75A	70A	75A	70A	75A
3.2	100A	110A	100A	100A	100A
4.0	150A	140A	130A	125A	125A

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

Basic electrode

Classification

AWS A5.1 : E7018-1
 ISO 2560-A : E 46 3 B 32 H5

General description

Basic very low hydrogen electrode
 Excellent for general purpose welding
 Good impact values at -46°C

Welding positions



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

Current type

DC +/-

Approvals

ABS	BV	DNV	GL	LR	RINA	TÜV
4Y40H5	4Y40HHH	4Y40H5	+	4Y40H5	4Y40H5	+

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

C	Mn	Si
0.05	1.0	0.3

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-40°C	-46°C
Required: AWS A5.1		min. 400	min. 483	min. 22		min. 27
ISO 2560-A		min. 420	500-640	min. 20	min. 47	
Typical values	AW	436	533	29	100	90

Packaging and available sizes

	Diameter (mm)	2.5	3.2	3.2	4.0	4.0	5.0
	Length (mm)	350	350	450	350	450	450
Unit: box	Pieces / unit	175	115	115	80	80	55
	Net weight/unit (kg)	3.9	4.0	5.2	4.1	5.3	5.6

Identification Imprint: LINCOLN 7018-1

Tip Color: none

LINCOLN® 7018-1: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
2.5x350	70-90	DC+	59	132	0.9	22.3	71	1.59
3.2x350	100-130	DC+	65	221	1.2	34.8	48	1.66
3.2x450	100-135	DC+	75	272	1.4	45.2	36	1.61
4.0x350	130-180	DC+	64	313	1.9	51.3	29	1.51
4.0x450	130-190	DC+	77	410	2.2	66.3	21	1.41
5.0x450	220-260	DC+	84	657	3.0	101.8	14	1.43

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G
2,5	80A	85A	85A	85A	80A
3,2	120A	115A	115A	115A	110A
4.0	170A	180A	180A	180A	160A
5.0	240A	250A	250A	250A	230A

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C

High recovery basic electrode

Classification

AWS A5.1 : E7028 H4R
 ISO 2560-A : E 42 2 B 53 H5

General description

Basic low hydrogen electrode ($H_{DM} < 5 \text{ ml/100g}$)
 150% recovery
 Easy slag release
 Fillet welds and horizontal V- and X-welds
 Excellent weldability on AC and DC
 Transformers with OCV > 70V recommended
 Also available in vacuum sealed Sahara ReadyPack® (SRP)

Welding positions



ISO/ASME PA/1G PB/2F PC/2G

Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	TÜV
3H,3Y	3,3YH	3YH5	3YH10	3,3YH15	+

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

C	Mn	Si	H_{DM}
0.07	0.95	0.4	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-18°C	-20°C
Required: AWS A5.1		min. 400	min. 483	min. 22	min. 27	
ISO 2560-A		min. 420	500-640	min. 20	min. 47	
Typical values	AW	540	580	27	75	

Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0	6.0
	Length (mm)	450	450	450	450
Unit: box	Pieces / unit		55	35	
	Net weight/unit (kg)		5.3	5.2	
Unit: SRP	Pieces / unit	28	21	18	8
	Net weight/unit (kg)	1.9	2.1	2.7	1.6

Identification

Imprint: 7028 / CONARC L150

Tip Color: yellow

Conarc® L150: rev. EN 23

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
3.2 x 450	140 - 160	AC/DC+	84	375	1.7	64.8	26	1.67
4.0 x 450	175 - 220	AC/DC+	80	555	2.6	97.8	17	1.69
5.0 x 450	275 - 325	AC/DC+	75	838	4.4	155.7	11	1.72
6.0 x 450	325 - 350	AC/DC+	85	1260	5.4	209.4	8	1.64

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G
3.2	150A	150A	140A
4.0	210A	200A	190A
5.0	310A	280A	
6.0	360A	300A	

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C
Transformers with OCV > 70 V recommended

High recovery basic electrode

Classification

AWS A5.1 : E7028 H4R
ISO 2560-A : E 42 4 B 73 H5

General description

Basic extremely low hydrogen electrode
175% recovery and easy slag release
Fillet welds and horizontal V- and X-welds
Reliable impact toughness -40°C, good CTOD at -10°C
Excellent X-ray quality
Also available in vacuum sealed Sahara ReadyPack® (SRP): H_{DM} < 3 ml/100g

Welding positions



ISO/ASME PA/1G PB/2F PC/2G

Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RINA	RMRS
3YH5	3,3YHH	3YH5	3YH10	3,3YH5	3YH5	3-3YH5

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

C	Mn	Si	H _{DM}
0.08	1.2	0.3	2 ml/100g

Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
				-18°C	-20°C	-40°C
Required: AWS A5.1	min. 400	min. 483	min. 22	min. 27		
ISO 2560-A	min. 420	500-640	min. 20	min. 47		
Typical values AW	440	510	30	130 80		
CTOD value at -10°C > 0.25 mm						

Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0	6.3
	Length (mm)	450	450	450	450
Unit: box	Pieces / unit	85	60	40	23
	Net weight/unit (kg)	5.7	6.0	6.1	5.4
Unit: SRP	Pieces / unit	27	23	19	8
	Net weight/unit (kg)	2.0	2.4	2.8	1.9

Identification

Imprint: 7028 / CONARC V180

Tip Color: white

Conarc® V180: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52, X60
EN 10216-1/ EN 10217-1	P235T1, P235T2, P275T1 P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
3.2 x 450	130 - 160	AC	73	337	2.3	68.9	21	1.47
4.0 x 450	170 - 240	AC	70	538	3.6	101.0	14	1.45
5.0 x 450	275 - 330	AC	75	780	4.9	149.7	10	1.45
6.3 x 450	280 - 425	AC	83	1171	7.0	230.4	6	1.43

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G
3.2	160A	140A	140A
4.0	230A	190A	190A
5.0	300A	230A	230A
6.3	390A	280A	

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C
Transformers with OCV > 70 V recommended

High recovery basic electrode

Classification

AWS A5.1 : E7028 H4R
 ISO 2560-A : E 42 4 B 73 H5

General description

Basic low hydrogen electrode ($H_{DM} < 5 \text{ ml/100g}$)
 245% recovery and easy slag release
 Fillet welds and horizontal V- and X-welds
 Good impact values at $-40 \text{ }^\circ\text{C}$
 Excellent X-ray soundness
 Deposition rate is comparable with submerged arc welding

Welding positions



ISO/ASME PA/1G PB/2F*

Current type

AC / DC + / -

Approvals

ABS	BV	DNV	GL	LR	RINA	RMRS	TÜV
4Y400H5	3,3YHH	4Y40H5	4Y40H5	4Y40H5	4YH5	3-3YH5	+

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

C	Mn	Si	H_{DM}
0.08	1.3	0.45	4 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-18°C	-40°C
Required: AWS A5.1		min. 400	min. 483	min. 22	min. 27	
ISO 2560-A		min. 420	500-640	min. 20	min. 47	
Typical values	AW	460	550	29	80	

Packaging and available sizes

Unit: box	Diameter (mm)	4.0	5.0	6.0
	Length (mm)	450	450	450
Pieces / unit	42	26	19	
Net weight/unit (kg)	5.9	5.8	5.8	

Identification

Imprint: 7028 / CONARC V250

Tip Color: red

Conarc® V250: rev. EN 22

Materials to be welded

Steel grades/Code	Type
General structural steel	
EN 10025	S185, S235, S275, S355
Ship plates	
ASTM A131	Grade A, B, D, AH32 to EH40
Cast steel	
EN 10213-2	GP240R
Pipe material	
EN 10208-1	L210, L240, L290, L360
EN 10208-2	L240, L290, L360, L415, L445
API 5LX	X42, X46, X52
EN 10216-1/	P235T1, P235T2, P275T1
EN 10217-1	P275T2, P355N
Boiler & pressure vessel steel	
EN 10028-2	P235GH, P265GH, P295GH, P355GH
Fine grained steel	
EN 10025 part 3	S275, S355, S420
EN 10025 part 4	S275, S355, S420

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
4.0 x 450	190 - 240	AC	70	621	4.8	141	10	1.40
5.0 x 450	260 - 360	AC	73	1017	7.1	217	7	1.39
6.0 x 450	300 - 470	AC	72	1324	10.1	300	4	1.37

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F
4.0	230A	200A
5.0	300A	260A
6.0	390A	

Remarks/ Application advice

Electrodes after removal from cardboard boxes redry 2-4h 350 ± 25°C
Transformers with OCV > 70 V recommended

Low strength basic electrode

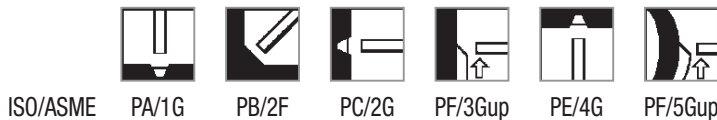
Classification

AWS A5.1 : E6018 ¹⁾
 ISO 2560-A : E 35 2 B 32 H5
¹⁾ according to classification 1966

General description

Basic extremely low hydrogen electrode
Repairs and tie-ins in oil and gas transport pipe lines
Low yield and ultimate tensile strength, high impact toughness
Buffer layer electrode for internally clad stainless steel
Only available in vacuum sealed Sahara ReadyPack® (SRP): H_{DM} < 3 ml/100g

Welding positions



Current type

AC / DC + / -

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

C	Mn	Si	H _{DM}
0.03	0.4	0.25	3 ml/100 g

Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-18°C	-20°C
Required: AWS A5.1		min. 331	min. 414	min. 22	min. 27	
ISO 2560-A		min. 355	440-570	min. 22		
Typical values	AW	390	450	28	>200	

Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	350	350	350
Unit: SRP	Pieces / unit	23	17	28
	Net weight/unit (kg)	0.5	0.7	1.5

Identification

Imprint: KARDO

Tip Color: black

Kardo®: rev. EN 22

Materials to be welded

Weld the buffer layer of CrNi- and CrNiMo-stainless clad steel with one side welding.

High strength fine grained steel as S460 for NH3 storage tanks, to weld very soft, ferritic cap layers

Pipe line steel grades, to weld low yield strength fillet welds in split-T-joints (system NederlandseGasunie)

API 5L: X52 - X65 (EN 10208: L360 to L460).

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
2.5 x 350	60 - 80	DC+	81	173	0.5	19.7	81	1.60
3.2 x 350	90 - 120	DC+	84	252	1.0	36.5	43	1.58
4.0 x 350	120 - 160	DC+	79	448	1.6	53.0	29	1.56

* stub end 35 mm

Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	80A	80A	80A	85A	80A	80A
3.2	140A	120A	145A	120A	120A	120A
4.0	150A	140A	150A	140A	135A	140A

Remarks/ Application advice

Use electrodes directly from Sahara ReadyPack.

Restrict dilution on stainless steel root runs.