

Creep resistant basic electrode

Classification

AWS A5.5-96 : E9018-B3 H4
EN 1599-97 : E CrMo2 B 32 H 5

General description

Basic coated electrode for welding 2.25% Cr 1% Mo-creep and hydrogen resistant steels

Extra low hydrogen in the weld metal $H_{DM} < 5$ ml/100g (SRP)

Excellent weldability for pipe and site welding

Reliable X-ray properties

Good mechanical properties in the as welded and stress relieved condition

Applicable for service temperature from -20 to 600°C

SL 20G (STC) meets the actual "step cool" requirements including the Bruscatto factor $X < 15$

Also available in vacuum sealed Sahara ReadyPack® (SRP)

Welding positions



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

Current type

AC / DC electr. + / -

Approvals

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

C	Mn	Si	P	S	Cr	Mo	Bruscatto	H_{DM}
0.10	0.6	0.35	0.01	0.01	2.3	1.0	max. 15 ppm	3 ml/100g

Mechanical properties, all weld metal (for creep data see overleaf)

	Condition	0.2% Proof strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					+20°C	-20°C
Required: AWS A5.5-96	SR1)	min. 530	min. 620	min. 17	not required	
EN 1599-97	SR2)	min. 400	min. 500	min. 18	min. 47	
Typical values:	SR3)	540	640	20	160	80

Stress relieving: SR1) = 690±14°C/1h, SR2) = 690-750°C/1h, SR3) = 695°C/1h

Shifting CVN at 55 J(DeltaT55): +10°C after "STC" (step cool treatment)

Packaging, available sizes and identification

	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	350	350	350	450
Unit: SRP	Pieces / unit (nominal)	67	51	28	23
	Net weight/unit (kg)	1.4	2.0	1.5	1.6
Unit: box	Pieces / unit	110	120	85	xx
	Net weight/unit (kg)	2.6	4.7	4.8	xx

Identification Imprint: 9018-B3/SL20G (STC)

Tip colour: White

SL®20G(STC): rev. EN 15

Materials to be welded

Steel	Code	Type
Creep and hydrogen resisting steel	EN 10028-2	10 CrMo 9-10
	EN 10222-2	12 CrMo 9-10

Creep Data

Test temperature	°C	400	450	500	550	600
Yield strength Rp0.2%	N/mm ²	480	460	430		
Creep strength Rm/1000	N/mm ²			240	160	100
Creep strength Rm/10.000	N/mm ²			210	110	60
Creep resistance Rp1%/10.000	N/mm ²			160	85	45

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 - 95	DC+	63	114	0.72	21.0	79	1.67
3.2 x 350	80 - 145	DC+	70	233	1.3	37.6	40	1.49
4.0 x 350	120 - 185	DC+	75	348	1.7	56.7	28	1.56
5.0 x 450	160 - 260	DC+	100	754	2.6	107.6	14	1.47

* stub end 35mm

Welding parameters, optimum fill passes

Welding position: Diameter(mm)	PA/1G Current (A)	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	80	85	80	85	80	80
3.2	130	120	130	120	120	120
4.0	150	145	140	140	140	140
5.0	225	225	210			

Remarks

Recommended preheat temperature: 200 - 300°C

Recommended stress relieving temperature range: 680 - 750°C (time depends on material thickness)

Stepcooling requirements: Bruscato factor $X = (10 P + 5 Sb + 4 Sn + As)/100 \leq 15$ ppm and Mn + Si < 1.1

Application Advice

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