Product Data Sheet

OK B3 SC

E 'Manual metal-arc welding'
ESAB Perstorp AB Sweden

Prepared by	Qualified by	Approved by	Reg no	Cancelling	Reg date	Page
AC Thorsson	P-O Oskarsson	J-P Ernoult	EN009366	EN009254	2021-01-26	1 (3)

REASON FOR ISSUE

New Product

GENERAL

OK B3 SC is a basic AC/DC electrode designed for welding of creep resistant 2,25% Cr 1% Mo alloyed steels, SA-387 Grade 22, A335 Grade P22 or similar materials when highest toughness values are required also after step cooling treatment. Very low level of impurity elements providing a X-bar max. 10 for temper embrittlement resistant applications. Usually welding is followed by a PWHT. Suitable for refinery, petrochemical and chemical industries, power generation, pressure vessels, etc.

Min AC OCV: 65
Polarity: DC+-, AC

Alloy Type: Low alloyed (2.25% Cr ; 1% Mo)
Coating Type: Basic covering
Diff Hydrogen: < 4.0 ml/100g

WELDING POSITIONS

1 2 3 4 6 7

CLASSIFICATIONS Weld Metal

SFA/AWS A5.5	E9018-B3 H4 R
EN ISO 3580-A	E CrMo2 B 32 H5

APPROVALS

CE	EN 13479
VdTÜV	19612

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max	Nom
C	0.05	0.12	0.85
Si	0.2	0.3	0.20
Mn	0.6	0.8	0.7
P		0.007	0.005
S		0.007	0.004
Cr	2.10	2.50	2.35
Ni		0.10	0.04
Mo	0.90	1.10	1.0
V		0.010	0.007
Nb		0.006	0.004
Cu		0.1	0.04
Al		0.010	0.002
Sn		0.005	0.004
Ti		0.010	0.007
As		0.004	0.002
Sb		0.003	0.001
B		0.001	0.0002
J-factor		130	70
Mn+Si		1.1	0.9
Nb+Ti+V		0.02	0.018
P+Sn		0.012	0.009
PE		3.3	2.7
X-bar		10	7
Others tot		0.50	

MECHANICAL PROPERTIES OF WELD METAL

Standard	Condition	Rp0.2 [MPa/ksi]		Rm [MPa/ksi]			A4 [%]		A5 [%]	
		Min	Typ	Min	Max	Typ	Min	Typ	Min	Typ
EN ISO	PWHT 690°C 1h	400/58		500/73					18	
AWS	1.PWHT 690°C 1h	530/77	550/80	620/90		650/94	17	23		
AWS	2.PWHT 690°C 4h	415/60	540/78	585/85	690/100	650/94	22	25		
AWS	3.PWHT 690°C 32h	320/46	460/67	520/75	690/100	580/84	20	27		
AWS	4.PWHT 690°C 32h (Test Temp. 454°C)	232/34	370/54	415/60		455/66		18		

Comments:

Standard	Condition	Temp [°C/°F]	Charpy V [J/ft-lb]	
			Min	Typ
EN ISO	PWHT 690°C 1h	20/68 -30/-22	47/35	
AWS	1.PWHT 690°C 1h	20/68 -30/-22		120/89
AWS	2.PWHT 690°C 4h	20/68 -30/-22	55/41	150/111
AWS	3.PWHT 690°C 32h	20/68 -30/-22	55/41	140/104

Comments:

For 4h and 32h PWHT time : No Single values below 48 J (35 ft-lb)

ECONOMICS & CURRENT DATA

Dimension	Current (A)		W	η	N	B	H	T	U	Welding Positions
Ø x Length	Min	Max	Nom	Nom	Nom	Nom	Nom	Nom	Nom	
2.5 x 350 mm (0.098 x 13.8 in)	60	95	2.2	110	60	75	0.8 kg/h (1.8 lb/h)	63	23	1,2,3,4,6,7
3.2 x 350 mm (1/8 x 13.8 in)	75	145	3.4	110	60	48	1.2 kg/h (2.6 lb/h)	62	23	1,2,3,4,6
4.0 x 450 mm (5/32 x 17.7 in)	100	200	7.0	103	58	25	1.7 kg/h (3.7 lb/h)	86	26	1,2,3,4,6
5.0 x 450 mm (0.197 x 17.7 in)	115	260	10.9	110	63	15	2.3 kg/h (5.1 lb/h)	106	25	1,2,3,4,6

W = Weight (kg / 100 electrodes)
η = Filler metal efficiency (g weld metal x 100 / g wire)(%)
N = Deposition efficiency (g weld metal x 100 / g electrode)(%)
B = Changes (number of electrodes / kg weld metal)
H = Deposition rate at 90% of max current (kg weld metal/hour arc time)
T = Fusion time at 90% of max current (s/electrode)
U = Arc voltage (V)

OTHER DATA

Typical values for the mechanical properties are welded with 90% of Imax, with current type AC for stress relieved 1h and DC+ for stress relieved 4h and 32h.

Step Cooling, API 934-A, DC+:

CvTr55+3.0xdCvTr55 < 10° C (Typical: -30° C)

Hardness (PWHT, 690°C, 4 hours) < 235 HV10 (DC+, Typical 210 HV10)

General comments to Chemical Compositions :

X-bar = (10P+5Sb+4Sn+As) /100 (Values in ppm)

J-factor = (Mn + Si)(P + Sn) x10.000 (Values in wt %),

PE = (C+Mn+Mo+Cr/3+Si/4)+3.5x(10P+5Sb+4Sn+As) (Values in wt%)

Others tot: Includes V, Al, Nb, Ti, B and N but not Fe

For Mn+Si max 1.10 or any other specific requirement: Address ESAB