Product Data Sheet

E 'Manual metal-arc welding'
ESAB AB Sweden

OK 76.28

Signed by	Approved by	Reg no	Cancelling	Reg date	Page
P-O Oskarsson	Tony Dray/Christos Skodras	EN004147	EN002438	2007-09-20	1 (3)

REASON FOR ISSUE

Approvals up dated

GENERAL

Basic DC electrode for welding creep-resisting steels of the type 2 1/4% Cr 1% Mo.

Polarity: DC (+-)

Alloy Type: Creep-resisting
Coating Type: Lime Basic

WELDING POSITIONS

CLASSIFICATIONS Electrode

EN 1599	ECrMo2 B 42 H5
SFA/AWS A5.5	E9018-B3

APPROVALS

ABS	SR
BV	C2M1
Seproz	
VdTÜV	00971

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.05	0.10
Si	0.10	0.50
Mn	0.40	0.90
P		0.020
S		0.020
Cr	2.05	2.45
Ni		0.1
Mo	0.90	1.20
V		0.03
Nb		0.01
Cu		0.1
Sn		0.01
Pb		0.02
As		0.01
Sb		0.01

Comments:
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MECHANICAL PROPERTIES OF WELD METAL

	All Weld Metal			
	ISO		ISO	
	As welded		PWHT 750°C 1h	
Properties	**Min**	**Typ**	**Min**	
Rp0.2 (MPa)	530	550	530	
Rm (MPa)	620	650	620	
A4-A5 (%)	18		18	
Charpy V at 20°C (J)	47	50	47	
Charpy V at -20°C (J)		25		

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
Ø x Length	Min	Max							
2.0 x 300	55	80	1.3	115	0.58	136.0	0.7	40	23
2.5 x 300	70	110	2.0	115	0.58	88.0	0.8	52	25
3.2 x 350	95	150	3.5	105	0.59	49.0	1.2	62	26
4.0 x 450	130	190	6.9	110	0.64	23.0	1.8	88	28
5.0 x 450	150	260	10.7	110	0.64	14.5	2.7	92	29
6.0 x 450	200	350	15.1	110	0.64	10.5	3.9	90	30

W = Weight (kg / 100 electrodes)
η = Efficiency (g weld metal x 100 / g core wire)
N = Effective value (kg weld metal / kg electrodes)
B = Changes (number of electrodes / kg weld metal)
H = Deposit 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)

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OTHER DATA

Welding and heat treatment conditions:
All weld specimens, welded at 250 °C interpass temp:
As-welded:....Rp0.2 = >550 N/mm2, Rm = >650 N/mm2, A5 = >18 %, Z = >60 %
Annealed 2h at 750 °C, furnace-cooled:
Minimum:.....Rp0.2 = 440 N/mm2, Rm = 560 N/mm2, A5 = 20 %, Z = 65 %
Typical:.....Rp0.2 = 510 N/mm2, Rm = 620 N/mm2, A5 = 22 %, Z = 72 %
Annealed 1h at 700 °C, furnace-cooled:
(+20 °C):.....Rp0.2 = 545 N/mm2, Rm = 650 N/mm2, A5 = 22 %, Z = 70 %
(+100 °C):...Rp0.2 = 520 N/mm2, Rm = 610 N/mm2, A5 = 20 %, Z = 72 %
(+200 °C):...Rp0.2 = 490 N/mm2, Rm = 570 N/mm2, A5 = 18 %, Z = 72 %
(+300 °C):...Rp0.2 = 480 N/mm2, Rm = 550 N/mm2, A5 = 17 %, Z = 70 %
(+400 °C):...Rp0.2 = 480 N/mm2, Rm = 570 N/mm2, A5 = 15 %, Z = 66 %
(+450 °C):...Rp0.2 = 460 N/mm2, Rm = 535 N/mm2, A5 = 15 %, Z = 66 %
(+500 °C):...Rp0.2 = 445 N/mm2, Rm = 500 N/mm2, A5 = 17 %, Z = 70 %
(+550 °C):...Rp0.2 = 410 N/mm2, Rm = 445 N/mm2, A5 = 18 %, Z = 74 %
(+600 °C):...Rp0.2 = 360 N/mm2, Rm = 385 N/mm2, A5 = 24 %, Z = 80 %

Creep-rupture properties (values within brackets are extra-polated):
All-weld specimens, welded at 250 °C interpass temp. 0.5h at 700 °C, Furnace-cooled.
Stress, at a rupture time of:
Temp (°C)1.....100 (h).....500 (h).....1000 (h).....5000 (h).....10000 (h).....20000 (h)
500.....--.....307 (N/mm2).....272 (N/mm2)....220 (N/mm2).....198 (N/mm2).....180 (N/mm2)
550.....200 (N/mm2)...174 (N/mm2).....157 (N/mm2)....125 (N/mm2).....113 (N/mm2).....102 (N/mm2)
575.....--.....>108 (N/mm2).....>96 (N/mm2).....>73 (N/mm2)....>65 (N/mm2).....>59 (N/mm2)