



# Product Data Sheet

# OK 76.28

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

Prepared by P-O Oskarsson	Qualified by Tero Borg	Approved by J-P Ernoult	Reg no EN007152	Cancelling EN007099	Reg date 2016-03-18	Page 1 (3)
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## REASON FOR ISSUE

BV approval added.

## GENERAL

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

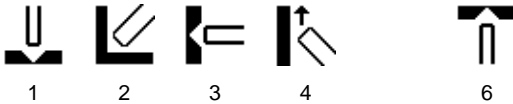
**Polarity:** DC+(-)

**Alloy Type:** Creep-resisting

**Coating Type:** Lime Basic

**Diff Hydrogen:** <5ml/100g

## WELDING POSITIONS



## CLASSIFICATIONS Electrode

SFA/AWS A5.5      E9018-B3  
EN ISO 3580-A      E CrMo2 B 4 2 H5

## APPROVALS

ABS                      SR H5\*  
BV                        C2M1 H5  
CE                        EN 13479  
NAKS/HAKC          2.5-5.0 mm  
VdTÜV                  00971

## APPROVAL COMMENT

NAKS/HAKC: Valid for lot numbers starting with SB

## 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		0.010
Cu		0.1
Sn		0.01
Pb		0.02
As		0.01
Sb		0.01



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------------------------------	---------------------------	----------------------------	--------------------	------------------------	------------------------	---------------

## MECHANICAL PROPERTIES OF WELD METAL

Properties	ISO		AWS
	Min	Typ	Min
	PWHT 690°C 1h		PWHT 690°C 1h
Rp0.2 (MPa)	400	630	530
Rm (MPa)	540	720	620
A4 (%)			17
A5 (%)	20	21	
Charpy V at 20°C (J)	47	130	
	Comments: EN requires Rm min 500 Mpa and A5 min 18%.		Comments:

## ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U	Welding Positions
	Min	Max								
2.0 x 300	55	80	1.3	115	0.58	136.0	0.7	40	23	1,2,3,4,6
2.5 x 300	70	110	2.0	115	0.58	88.0	0.8	52	25	1,2,3,4,6
3.2 x 350	95	150	3.5	105	0.59	49.0	1.2	62	26	1,2,3,4,6
4.0 x 450	130	190	6.9	110	0.64	23.0	1.8	88	28	1,2,3,4,6
5.0 x 450	150	260	10.7	110	0.64	14.5	2.7	92	29	1,2,3
6.0 x 450	200	350	15.1	110	0.64	10.5	3.9	90	30	1,2

**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)