

OK Tubrod 14.11

Metal cored wire for high speed thin plate welding applications

New ESAB cored wire technology out performs solid wire with respect to quality and productivity.

OK Tubrod 14.11 in diameter 1.2mm is the first of a new generation of cored wires based on ESAB's revolutionary cored wire surface technology. It has been developed for the welding of thin-plate with a minimum thickness of 1.0mm and provides fabricators with a substantially faster and higher quality welding solution to 1.0 and 1.2mm solid MAG wire. OK Tubrod 14.11 is a unique product that markedly lowers the welding costs for mechanised and robotised fabrication.

The many advantages relative to solid wire relate to the extremely wide spray arc parameter envelope that begins as low as 160A. With solid wire spray arc starts at around 200A for diameter 1.0mm and 230A for diameter 1.2mm. These features are valid for the standard shielding gas M21 (Ar/15-25% CO₂), although optimal results are obtained in 92%Ar/8%CO₂ mixtures

Changing from solid wire to OK Tubrod 14.11 will in most cases, require no changes in the positioning of the welding gun so the conversion time is limited to the adjustment of welding parameters.

OK Tubrod 14.11 is available in Marathon Pac bulk drums for major downtime savings compared with using standard 300mm spools.

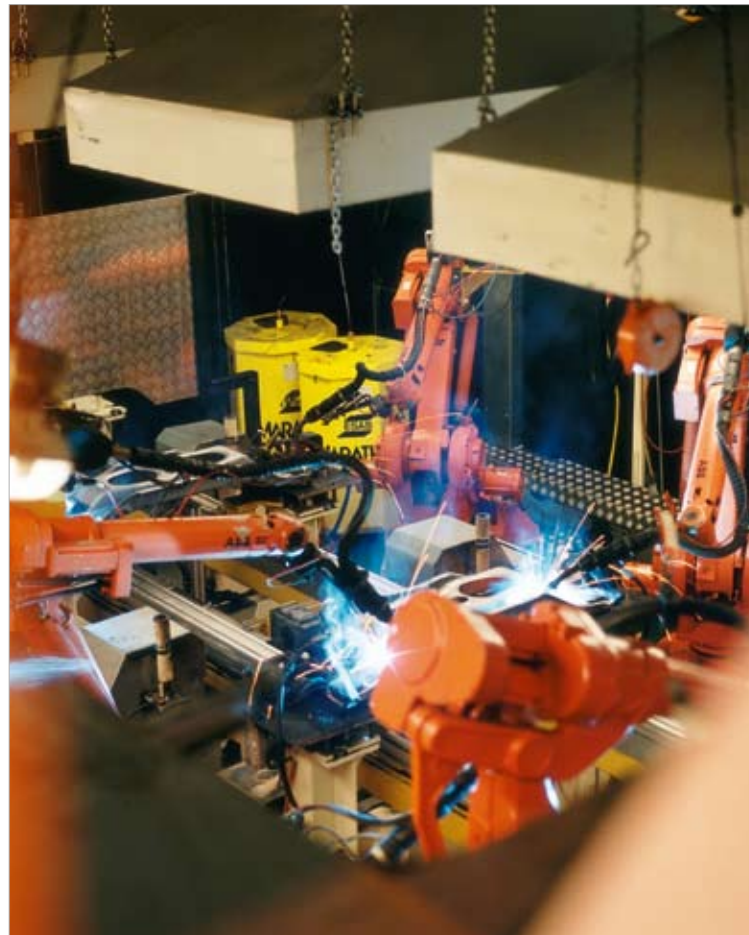
Faster welding

The majority of thin plate applications are welded with solid wire in the short arc or globular arc mode at moderate travel speed because high travel speeds in spray arc results in a deterioration of weld quality. With OK Tubrod 14.11 travel speeds of 150-250 cm/min. are perfectly feasible as shown in the tables overleaf for fillet and overlap welds. This difference in travel speed is equally valid for curved and circumferential welds.

Low spatter

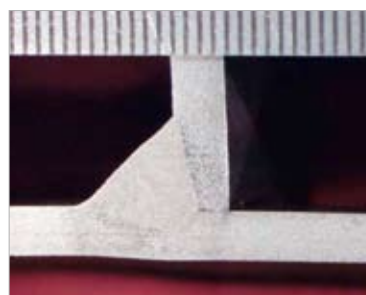
OK Tubrod 14.11 1.2mm operates in the spray arc mode at a current level as low as 160A enabling thin plate to be welded with very low spatter levels compared with solid wire welded in the short arc or globular arc mode resulting in the elimination of post weld cleaning. An additional advantage is that OK Tubrod 14.11 does not require the use of expensive pulsed power source technology.

An important feature is the ease of spray arc parameter setting. The voltage for thin-plate welding in spray arc is 22 - 24V for the entire range of wire feed speeds, from 7 to 14 m/min.



Compared to solid MAG wire, OK Tubrod 14.11 1.2mm offers:

- **Faster welding speeds**
- **Increased productivity**
- **Less deformation**
- **Excellent gap bridging**
- **Less spatter**
- **Lower repair/reject rates**



OK Tubrod 14.11-1.2mm in 92%Ar/% CO₂
-Torch angle 20° pushing



OK Tubrod 14.11-1.2mm in
92%Ar/% CO₂ -Torch angle 20°
pushing. Pipe to plate connection.

PB (2F) fillet weld in 1.5mm plate. Parameters for a high quality weld.

Gas	Consumable	Current	Arc voltage	WFS	v travel
92%Ar/8%CO ₂	solid wire 1.0	218A	22.8V	10m/min	165cm/min
	OK Tubrod 14.11 1.2	328	22.5	14	220
80%Ar/20%CO ₂	solid wire 1.0	220	24.5	11	155
	OK Tubrod 14.11 1.2	311	24	12.5	200

PA (1F) overlap weld in 1.5mm plate. Parameters for a high quality weld.

Gas	Consumable	Current	Arc voltage	WFS	v travel
92%Ar/8%CO ₂	solid wire 1.0	185A	20.3V	8.1m/min	105cm/min
	OK Tubrod 14.11 1.2	237	23.8	8.5	170
80%Ar/20%CO ₂	solid wire 1.0	183	20.3	8.1	100
	OK Tubrod 14.11 1.2	245	26.5	7.8	160

The excellent re-striking characteristics of OK Tubrod 14.11 also promotes low-spatter welding for components with many short welds. A stable arc establishes almost instantaneously after the arc is initiated.

Welding in spray arc generates more silica islands necessitating post weld cleaning for applications with cosmetic requirements. The islands however tend to appear in the center of the weld surface making them easier to remove.

Penetration and tolerance to poor fit up.

OK Tubrod 14.11 gives a high quality weld penetration profile as shown on the first page.

OK Tubrod 14.11 is also very forgiving with respect to poor fit-up, bridging gaps even at very high travel speeds - resulting in less post weld repair work and less rejects.

Low heat input welding

The extremely low arc voltage combined with a very high travel speed results in a relatively low heat input. Associated with this are fewer problems with workpiece deformation commonly found when welding with solid wires using the pulsing technique. Fillet welds in the PB (2F) position in 1.5mm plate can be welded at travel speeds in excess of 200cm/min resulting in heat inputs as low as 0.2kJ/mm. Overlap welds using the same plate thickness can be welded at speeds up to 160cm/min.

Product data OK Tubrod 14.11

Classification weld metal

Wire	Weld metal
EN 758: T 42 4 M M 3 H5	SFA/AWS A5.18: E70C-6M H4

Approvals

ABS	BV	DNV	LR	VdTÜV	DB	CE
4Y400SA (M21)	S3YMHH (M21)	III Y40 H5 (M21)	4Y40S H5 (M21)	10010	42.039.28 (M21)	EN 13479

Typical weld metal chemical composition (%), M21, DC+

C	Si	Mn
0.048	0.64	1.45

Typical weld metal mechanical properties, M21, DC+

Rp0.2 (MPa)	Rm (MPa)	A4-A5 (%)	CVN (J at °C)
458	558	32	55/-40



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