



# Railtrac - automated welding solutions for the repair of railtrack components

HIGH EFFICIENCY FOR REDUCED TRACK CLOSURE TIME



**STRENGTH THROUGH COOPERATION**

# Automated repair solutions that meet the highest safety standards



The control unit contains welding programmes for the repair of defects on any type of rail component, such as rail ends, plain rail defects, switch blades, wing rails and crossings. Just enter the required data in numbers and it is ready to start welding.



The ESAB name represents over a century of involvement in welding and repair applications with the highest quality and safety requirements. With ESAB, you are assured of a partner who understands your challenges and forms a single source for engineering, automation and consumables.

A long tradition in the rail repair industry and cooperation with major national railway administrations has resulted in automated FCAW solutions that meet the highest safety standards. Well balanced weld microstructures, without detrimental phases, provide resistance to any type of wear occurring in railway components due to passing rolling stock.

Worn rail components will limit the speed of rolling stock, reducing the capacity of railway tracks. Consistently and properly planned maintenance significantly improves the lifetime of rail components and consequently the lifecycle costs are remarkably reduced, compared with rail component replacement. This makes railway operation more economic.

ESAB offers welding and repair methods dedicated to the joining and repair on tracks as well as repair in workshops. The automated flux-cored arc welding process is highly productive and guarantees reduced grinding of the finished weld surface. This reduces the total repair time

and thereby limits the time railroads need to be closed for maintenance. Alternatively, it can be used for manual welding, in case of repairs with limited accessibility.

The portable, light-weight equipment is easily lifted onto the track and is prepared for welding within minutes. There is a choice of two power sources to suit low (<15 kVA) and higher power generator capacities.

ESAB flux-cored wires are supplied in a humidity protective packaging to guarantee low-hydrogen weld metal and maximum protection against cold cracking. They are

self-shielded, so can be used without shielding gas under the demanding outdoor conditions of rail repair. ESAB offers cored wires for the repair welding of both conventional (up to R260 grade) and head-hardened (up to R350HT) rail grades, including the various carbon-manganese and austenitic-manganese crossing castings, switch blades and stock rail.

ESAB is a total supplier for rail repair and joining. Next to electrodes and other welding consumables, ESAB offers a full range of mechanisation equipment, power sources, wire feeders, torches, accessories such as rail heaters and personal protective equipment.

ESAB is the only welding company with worldwide ISO 9001, ISO14001 and OHSAS 18001 certifications.

- Automated FCAW solutions that meet the highest safety standards.
- Portable, light-weight equipment.
- For any type of wear of railway components.
- For all material grades used in railway components.
- For a higher lifetime and lower life cycle costs.

# High deposition, self-shielded cored wires for automated repair of rail components

For surface welding of carbon-manganese railtrack components

OK Tubrodur 15.41	Hardness	Hardness	Chemical composition, all weld metal (%)								Micro-structure	Ø	GIN
	AW	WH	C%	Si%	Mn%	Cr%	Ni%	Al%	Mo%	V%			
	<b>HRC</b>	<b>HRC</b>	<b>C%</b>	<b>Si%</b>	<b>Mn%</b>	<b>Cr%</b>	<b>Ni%</b>	<b>Al%</b>	<b>Mo%</b>	<b>V%</b>		<b>(mm)</b>	
EN 14700	28-36	-	0.12	0.70	1.60	2.60	-	1.40	-	-	martensitic	1.6	1541167630
T Z Fe1												1.6	1541169460
16 kg spool												2.4	1541247630
300 kg MarathonPac													
16 kg spool													
	OK Tubrodur 15.41 is a self-shielded wire developed for surfacing of carbon-manganese rail components like rails, stock rails, switch rails and switchblades. Its weld metal hardness is in harmony with the conventional rail grades up to R260 grade. OK Tubrodur 15.41's welding performance is very convincing both from productivity and from weld metal surface finish point of view.												

OK Tubrodur 15.43	Hardness	Hardness	Chemical composition, all weld metal (%)								Micro-structure	Ø	GIN
	HRC	HRC	C%	Si%	Mn%	Cr%	Ni%	Al%	Mo%	V%			
	<b>HRC</b>	<b>HRC</b>	<b>C%</b>	<b>Si%</b>	<b>Mn%</b>	<b>Cr%</b>	<b>Ni%</b>	<b>Al%</b>	<b>Mo%</b>	<b>V%</b>		<b>(mm)</b>	
EN 14700	34-40	-	0.16	0.50	1.10	1.00	2.20	1.60	0.50	-	martensitic	1.2	1543124630
T Z Fe3												1.2	1543127630
4x4,5 kg spools												1.6	1543167630
16 kg spool												1.6	1543167680
16 kg spool													
10,5 kg spool													
	The self-shielded OK Tubrodur 15.43 was designed so that its weld metal provides higher hardness than OK Tubrodur 15.41. The achievable hardness is comparable with the hardness level of the advanced HP (High Performance) rail grades from R260 up to R400HT grades. Beside the higher hardness level its welding characteristic is adjusted to the increasing "Track closure time reduction" requirements of Railways Administrations and consequently the achievable deposit rate is on the level 7 kg/h.												

For re-building and surfacing of austenitic-manganese crossing casting

OK Tubrodur 14.71	Hardness	Hardness	Chemical composition, all weld metal (%)								Micro-structure	Ø	GIN
	HRC	HRC	C%	Si%	Mn%	Cr%	Ni%	Al%	Mo%	V%			
	<b>HRC</b>	<b>HRC</b>	<b>C%</b>	<b>Si%</b>	<b>Mn%</b>	<b>Cr%</b>	<b>Ni%</b>	<b>Al%</b>	<b>Mo%</b>	<b>V%</b>		<b>(mm)</b>	
EN 14700	20	41	0.12	0.8	6	18	8	-	-	8	austenitic	1.6	1471167730
T Fe10												2.4	1471247740
Packaging: 16 kg spool													
12 kg spool													
	OK Tubrodur 14.71 is a self-shielded wire giving 18/8/6 type chemical composition that makes it very suitable for welding of buffer layers as well as for re-building of the 14%Mn type austenitic casting. Its application is specially strongly recommended where the wear or crack removal made necessary to build up several layers. By the intermediate application of OK Tubrodur 14.71, at every fourth layers, the excessive Mn enrichment can be controlled and therefore the too high Mn content caused coincidental crack formation can be eliminated.												

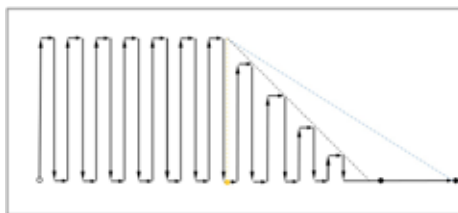
OK Tubrodur 15.60	Hardness	Hardness	Chemical composition, all weld metal (%)								Micro-structure	Ø	GIN
	HRC	HRC	C%	Si%	Mn%	Cr%	Ni%	Al%	Mo%	V%			
	<b>HRC</b>	<b>HRC</b>	<b>C%</b>	<b>Si%</b>	<b>Mn%</b>	<b>Cr%</b>	<b>Ni%</b>	<b>Al%</b>	<b>Mo%</b>	<b>V%</b>		<b>(mm)</b>	
EN 14700	20	46-50	0,85	0,8	13	-	3	0,6	-	-	austenitic	1.6	1560167740
T Fe9												2.4	1560247630
Packaging: 16 kg spool													
12 kg spool													
	OK Tubrodur 15.60 is a self-shielded wire depositing 14%Mn weld metal which is the identical chemical composition of the austenitic castings. This type of weld metal is soft in "as welded" condition but work hardens very rapidly due to the surface load it is subjected to. OK Tubrodur 15.60 provides the highest work hardened hardness hat may reach even the 500 HV level.												

OK Tubrodur 15.65	Hardness	Hardness	Chemical composition, all weld metal (%)								Micro-structure	Ø	GIN
	HRC	HRC	C%	Si%	Mn%	Cr%	Ni%	Al%	Mo%	V%			
	<b>HRC</b>	<b>HRC</b>	<b>C%</b>	<b>Si%</b>	<b>Mn%</b>	<b>Cr%</b>	<b>Ni%</b>	<b>Al%</b>	<b>Mo%</b>	<b>V%</b>		<b>(mm)</b>	
EN 14700	22	48	0,3	0,6	14	15	1,8	-	0,8	0,7	austenitic	1.6	1565167730
T Fe9													
Packaging: 16 kg spool													
	OK Tubrodur 15.65 is a 15%Cr/14%Mn type self-shielded wire. This chemical composition is the best seller for the cover layer of austenitic-manganese crossing's repair, beside tram rail curve restoration. It has excellent welding performance with low spatter level and very smooth arc transfer coupled with excellent slag detachability. These properties with the accompanying achievable extremely flat weld metal surface offers significantly reduced subsequent grinding time and cost.												

# Railtrac versions and welding programmes

## Railtrac BV1000

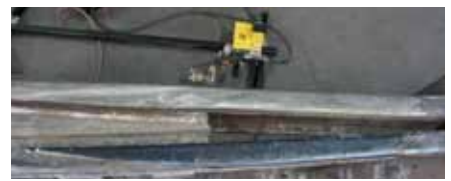
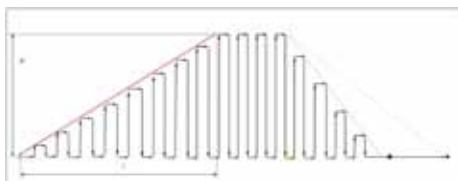
- P1**
- For repair surfacing of rail ends.
  - Transverse weaving.
  - 90°, 45° and 22.5° end taper.



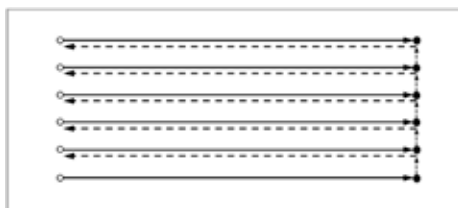
- P2**
- For repair surfacing of plain rail defects.
  - Transverse weaving.
  - 45° start taper.
  - 90°, 45° and 22.5° end taper.

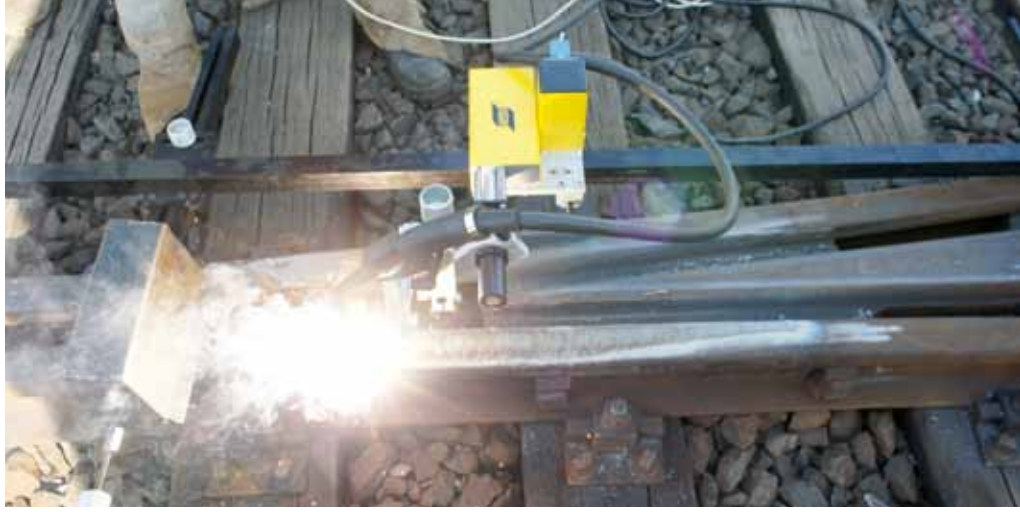


- P3**
- For repair surfacing of wing rails and C-Mn tips.
  - Transverse weaving.
  - 90°, 45° and 22.5° end taper.



- P4**
- For repair surfacing of 14% Mn austenitic-manganese (AM) crossing tips.
  - Longitudinal stringer bead welding.
  - Minimised heat input.





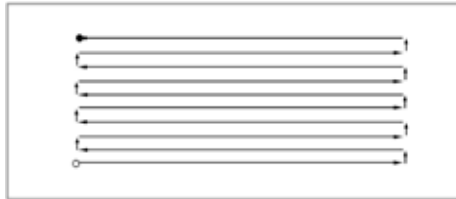
## Railtrac BVR1000

P1 - P4 identical to BV1000

- P5**
- For repair surfacing of plain rail defects.
  - Welds rectangular frame around the defect.
  - Two sensors applied.



- P6**
- For repair surfacing of plain rail defects.
  - In conjunction with Programme 5.
  - Surfaces the rectangular frame of Programme 5.
  - Longitudinal weaving.



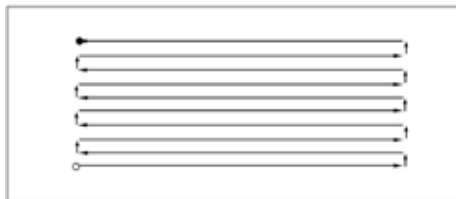
## Railtrac BV1001

P1 - P4 identical to BV1000

- P5**
- Welds stainless zig-zag for bead on the rail head to guarantee electrical conductivity for electric switches.



- P6**
- For repair surfacing of plain rail defects.
  - Manually controlled weld end points.
  - Longitudinal weaving.



# Railtrac ordering information



Railtrac BV1000



OrigoMig 4004i



Remote control

## Create your own Railtrac package

### Select a Railtrac!

Railtrac BV 1000 (4 programmes)	<b>0398145002</b>
Railtrac BVR 1000 (6 programmes)	<b>0398145003</b>
Railtrac BV 1001 (6 programmes)	<b>0398145004</b>

### Select a power source!

OrigoMig 4004i (with A44 panel)	<b>0465152880</b>
OrigoMig 3001i	<b>0459740882</b>

### Order all items below!

Origo Feed 4804w MA23 encl. 10 pole	<b>0460526997</b>
CABLE CONTROL BV to Feeder L=5M	<b>0457360880</b>
Set of crossing gauges	<b>0449537001</b>
Interconnection cable (10 m, 10 pole, air cooled)	<b>0459528782</b>
COUPLING OKC MALE/FEM/FEM	<b>0365557001</b>
Welding Cable KIT 400A, OKC 50	<b>0700006890</b>
Ground cable with standard clamp	<b>0160288001</b>
Magnetic clamp	<b>0000500416</b>
Wheel kit Aristo/Origo Feed	<b>0458707880</b>
Assembly of equipment	<b>0RTUARI001</b>
MIGGY-/RAILTRAC REMOTE ADAPTER	<b>0459681880</b>
FeedROLLER 3x1,6 mm	<b>0366966894</b>
BOGIE 3x1/16 RV-GROOVE	<b>0366902904</b>
Spool adapter for wire basket type 77	<b>2155400000</b>
Outlet nozzle	<b>0469837882</b>
Intermediate nozzle	<b>0332322001</b>
Inlet nozzle	<b>0332318001</b>
PSF505 L=4,5M EURO	<b>0458401885</b>
Contact Tip M8X37 W=16 Z	<b>0468502010</b>



Origifeed 4804



Connection cable



Earth clamp



Bogie



Contact tips

# World leader in welding and cutting technology and systems.



ESAB operates at the forefront of welding and cutting technology. Over one hundred years of continuous improvement in products and processes enables us to meet the challenges of technological advance in every sector in which ESAB operates.

## Quality and environment standards

Quality, the environment and safety are three key areas of focus. ESAB is one of few international companies to have achieved the ISO 14001 and OHSAS 18001 standards in Environmental,

Health & Safety Management Systems across all our global manufacturing facilities.

At ESAB, quality is an ongoing process that is at the heart of all our production processes and facilities worldwide.

Multinational manufacturing, local representation and an international network of independent distributors brings the benefits of ESAB quality and unrivalled expertise in materials and processes within reach of all our customers, wherever they are located.

ESAB Sales and Support Offices worldwide



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