

Testimonials

“ In today's world a reduction in carbon footprint requires a cost effective and sustainable transport system - weld restoration of worn Grooved Rails offers a cost effective approach for life extensions and a significant cost saving than replacing worn track. Using Welding Alloys and Tata Steel patented consumables, machinery and technology the cost savings can be fully maximized..

Dr Jay Jaiswal, Director,
Track Engineering &
Technologies, Tata Rail

”



“ We have been working with Welding Alloys for many years. I am impressed with the dedicated approach of Welding Alloys people. They are on hand to assist with technical issues and innovative solutions tailored to our needs.

Scott Wilson,
Welding Operations
Manager, VolkerRail

”

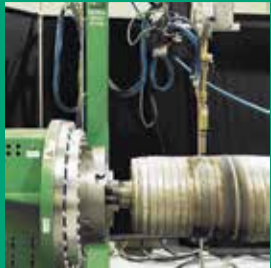


Customer references
across 5 continents

Our Technical ‘Spark’ Solves Your Industrial Challenges



WA Consumables
The go-to provider
of advanced welding
consumables

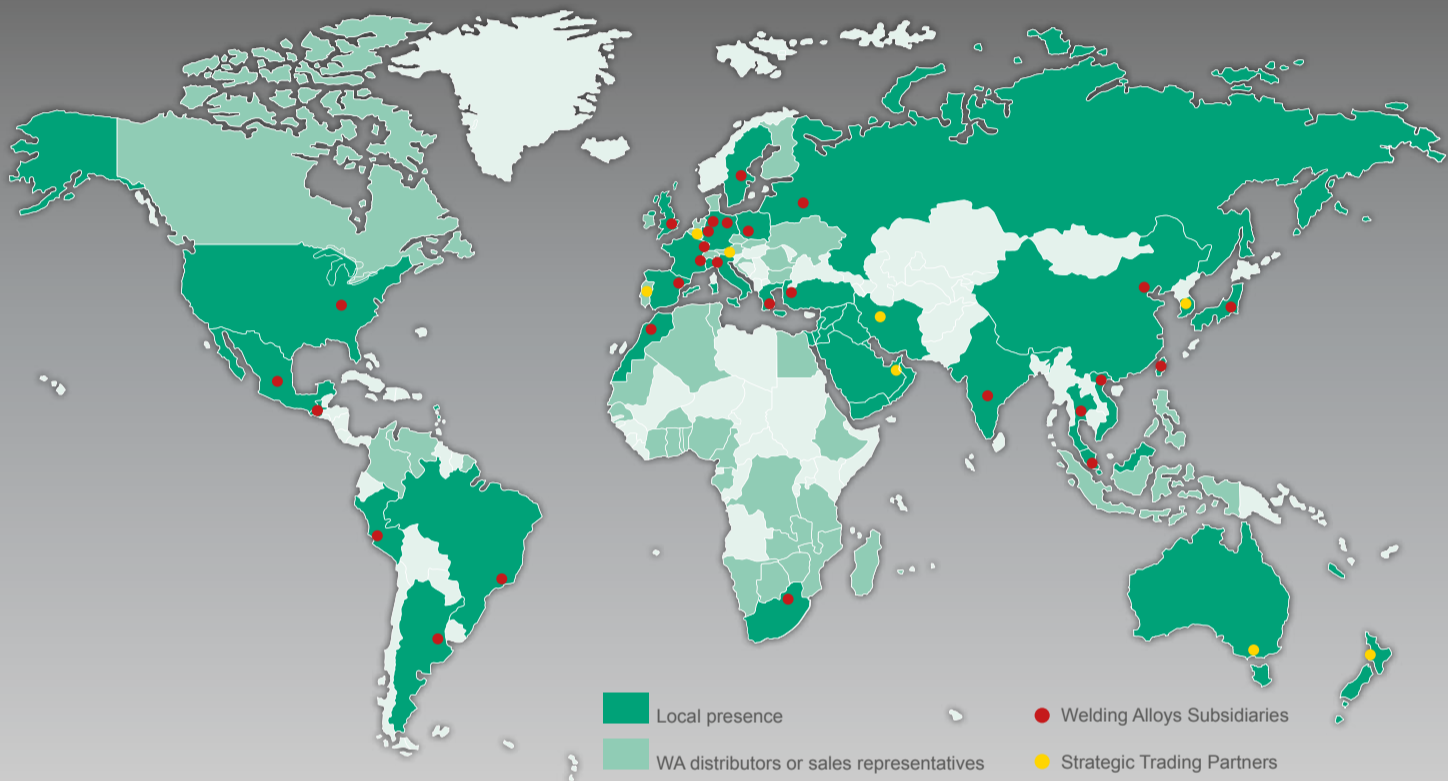


WA Machines
The go-to provider
of automated equipment
for wear protection



WA Integra™
The go-to provider
of engineered wear
protection solutions

A worldwide presence



www.welding-alloys.com



V2.0 03/2017



WA applications
for Railways and Light Rail

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Our technical ‘Spark’ solves
your industrial challenges!





Features & benefits of refurbishing

Quickly restore and
repair the rail in-situ

Recycle used rails by
repairing in the workshop

Improve the life and performance
of the rails using customised
welding consumables

Reduce rail maintenance
downtime and track closures

Achieve cost savings up to 80%
compared to replacement costs

Flux cored wires and automated solutions for :

Railway

- Crossings
- Switchblades and stock rail
- Rail heads

Light rail

- Crossings
- Switchblades and stock rail
- Rail heads
- Curved gauge corner

Gauge Corners

The fastest high tech tram rail rebuilding

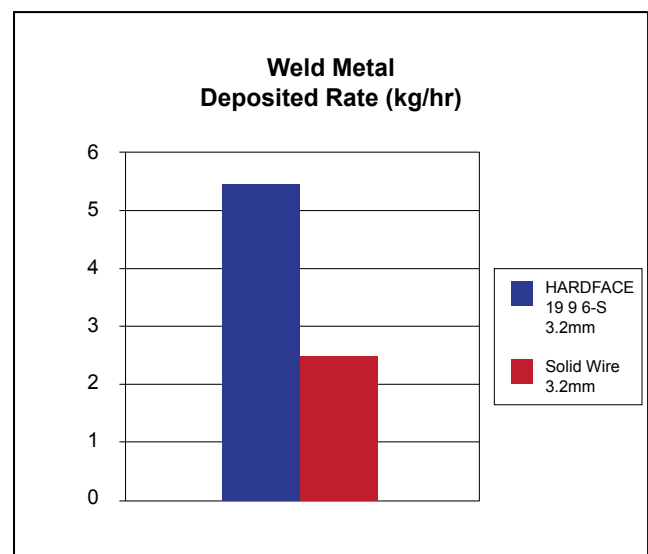


Weld rebuilding vs. replacement

In today's world, a reduction in carbon footprint requires cost effective and sustainable transport systems. Weld restoration of worn embedded grooved rails offers a cost-effective approach to extend the lifetime of the track and a significant cost saving compared to replacing worn track. Weld rebuilding can take place in-situ without the need to uproot the rails at major cost, disruption and environmental expense.

Features & benefits of cored wires vs. stick electrodes

- **Faster deposition rate** – saves time, leading to reduced rail maintenance downtime and required operator time.
- Minimisation of heat input and reduced heat affected zone (HAZ) – **homogeneous** weld deposit leading to **safer** rails.
- Higher level of **consistency** and **reproducibility** – using a fully automated process.
- Increased **integrity** and **quality** of repair.
- **Cost savings of more than 60%** per kg of metal deposited achievable.



Gauge Corners

The fastest high tech tram rail rebuilding



Why Welding Alloys?

- Consumables developed specifically for tramways and gauge corner restoration.
- Products approved worldwide.
- 50 years of experience in the manufacture of welding consumables.
- Able to customise solutions and offer technical expertise in developing welding procedures.
- Customer references across 5 continents.
- Manufacture of automated welding equipment to provide a complete on-site welding solution.
- Provide full training.
- Close work with OEM rail manufacturers to develop innovative and unique products.

Our products

Product name	Description
HARDFACE 19 9 6-S EN ISO 14700 T Fe10	Cored wires for gauge corner restoration. Austenitic structure up to 46 HRC.

Available as open arc, sub merged arc and coated electrodes



Profile of refurbished rail before grinding



Open arc welding process in Toronto



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Rail Crossings Refurbishment

The best welding solution for all rails

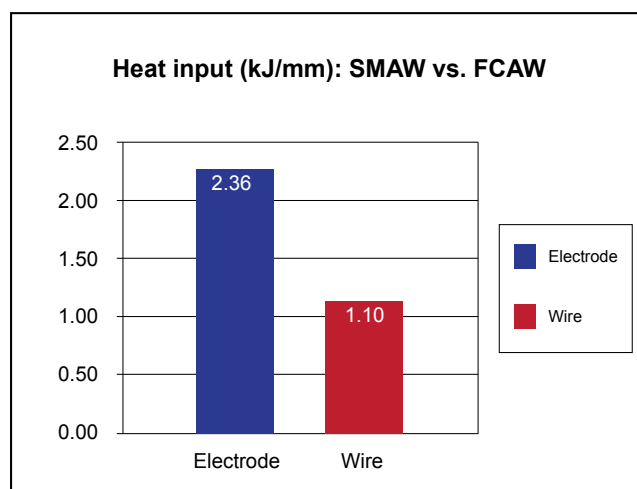


Weld rebuilding vs. replacement

Crossings or frogs are subjected to daily metal-to-metal wear, abrasion and impact, consequently they become extremely worn and subject to damage or potential breakages. Refurbishment by weld rebuilding allows you to: quickly restore and repair the crossing in-situ, recycle used crossings in the workshop, reduce maintenance downtime and track closures and achieve cost savings of 80% compared with replacement costs. Standard alloys used in rail crossings need to be welded by respecting low inter-pass temperature.

Features & benefits of cored wires vs. stick electrodes

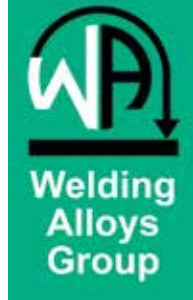
- **Faster deposition rate** – saves time, leading to reduced rail maintenance downtime and required operator time.
- **Minimisation of heat input** and reduced heat affected zone (HAZ) – safer rails with reduced embrittlement and extended lifetime.
- Higher level of **consistency** and **reproducibility** – fully automated or semi automated process .
- Increased **integrity** and **quality** of repair.
- According to US Rail **FCAW** is the favoured process across the USA, for **crossing rebuild** or **repair**



Heat input based on electrode at 200A & 25V welding @ 130mm/min and wire at 300A & 28V welding @450mm/min on a manganese crossing

Rail Crossings Refurbishment

The best welding solution for all rails



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- Provide full training.
- Close work with OEM rail manufacturers to develop innovative and unique products.

Our products

for Manganese crossings

Product name	Description
HARDFACE AP-O HARDFACE AP-G EN ISO 14700: T Fe9	Cored wires for Mn-steel track components; high rate of work hardening 50 HRC. (for HARDFACE AP-G) Shielding gas is M21
HARDFACE APRail-O EN ISO 14700: T Fe9	Open arc wire for Mn-steel track components, high rate of work hardening 50 HRC.



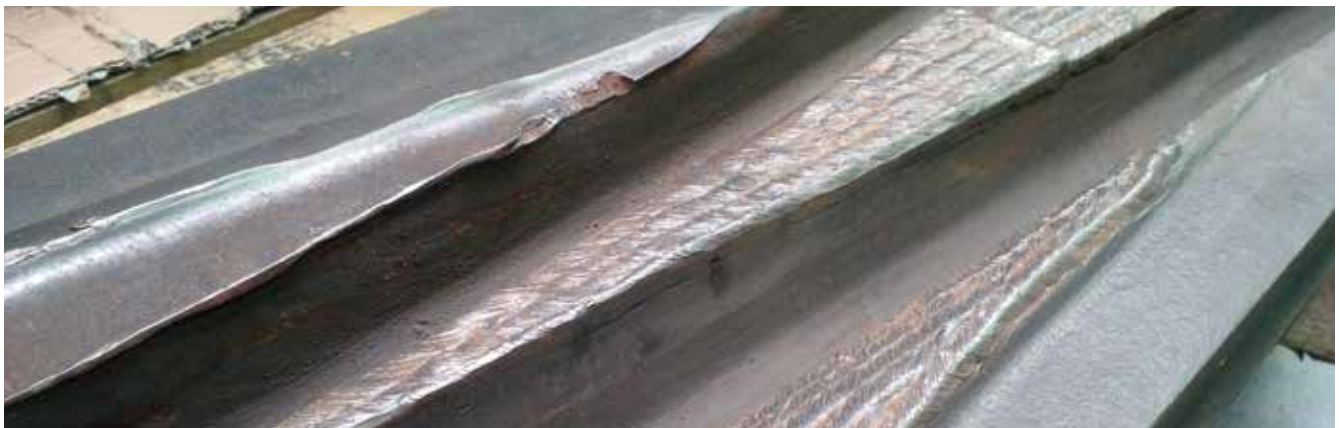
for Perlitic crossings

Product name	Description
HARDFACE TN-O HARD FACE TLN-O EN ISO 14700: T Fe3	Flux cored wire containing Ni for the build-up for the build-up of rail heads, rail ends, switch points and carbon steel crossings. Hardness 300-350 HB. DB Approval.

All product available in sizes 1.6mm and 2.0mm, as coupled with the travel speed puts less heat into a manganese crossing.

Applicable on all UIC/EN rail grades

*Available open arc and electrodes



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Rail Heads and Ends

One product for fast weld maintenance

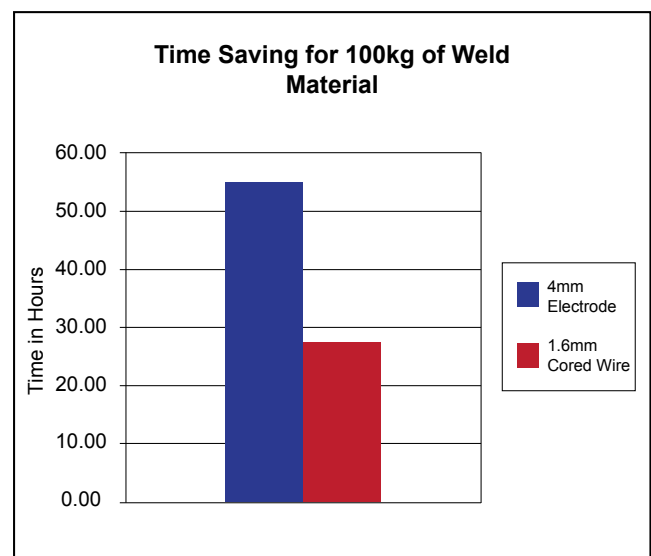


Maintenance vs. replacement

The rail heads can become damaged after a relatively short period of time due to the wheel spinning under load. The metal-to-metal wear leaves surface and sub-surface defects which, left untreated, can lead to further damage of the rail - resulting in premature failure. Refurbishment by weld rebuilding allows you: to restore the rail in-situ, recycle used rails in the workshop and reduce maintenance downtime. Using an automatic or semi-automatic process offers a cost effective solution compared to replacement of the rail. A joining solution for rails is also proposed.

Features & benefits of cored wires vs. stick electrodes

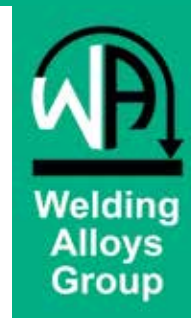
- **Faster deposition rate** – saves time, leading to reduced rail maintenance downtime and required operator time.
- **Minimisation of heat input** and reduced heat affected zone (HAZ) – safer rails with reduced embrittlement and extended lifetime.
- **Higher level of consistency and reproducibility** – fully automated or semi automated process .
- Increased **integrity** and **quality** of repair.
- **Cost savings** of more than **50%** per kg of metal deposited achievable.



Time savings of up to 50% using wire rather than electrode leading to significant cost savings

Rail Heads and Ends

One product for fast weld maintenance



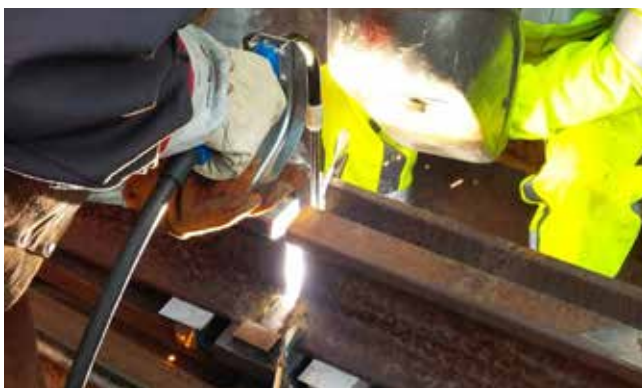
Why Welding Alloys?

- Consumables developed specifically for tramways and gauge corner restoration.
- Products approved worldwide.
- 50 years of experience in the manufacture of welding consumables.
- Able to customise solutions and offer technical expertise in developing welding procedures.
- Customer references across 5 continents.
- Manufacture of automated welding equipment to provide a complete on-site welding solution.
- Provide full training.
- Close work with OEM rail manufacturers to develop innovative and unique products.

Our product

Product name	Description
HARDFACE TN-O HARDFACE TLN-O EN ISO 14700: T Fe3	Flux cored wire containing Ni for the build-up of rail heads, rail ends, switch points and carbon steel crossings. Hardness 300-350 HB.
TRI S RW EN ISO 14700: T Fe10	Flux cored wire developed for butt - welding of all rail types. May also be used for surfacing.

Applicable on all UIC/EN rail grades
Available open arc and coated electrodes



Butt joint of rails welded with TRI S RW-O



Fully automated D3 Touch Rail buggy



Open - arc welding of rails



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Stock Rail and Switchblades

Efficient fast welding solution

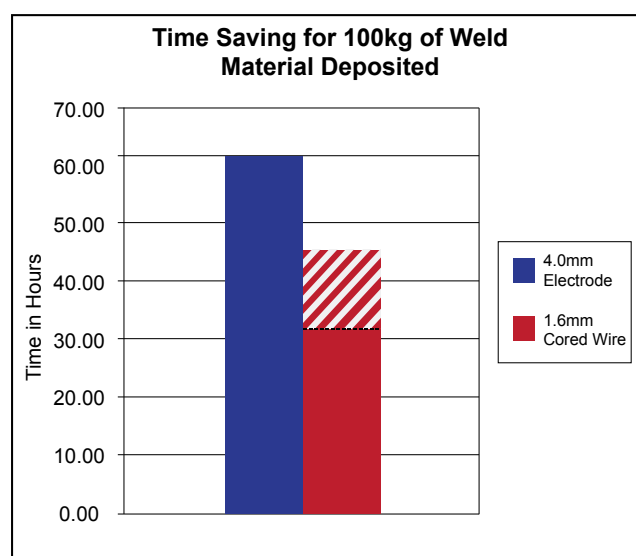


Weld rebuilding vs. replacement

The demand for reliable and safe transport systems is increasing year on year. The stock rail and blade of a railway is subjected to daily metal-to-metal wear and impact conditions, this leads to a high requirement for maintenance or replacement. Refurbishment by weld rebuilding allows you to: quickly restore the switch blade and stock rail in-situ, carry out maintenance in the workshop if required, reduce rail maintenance downtime and achieve cost savings of around 60% compared to replacement costs.

Features & benefits of cored wires vs. stick electrodes

- **Faster deposition rate** – saves time, leading to reduced rail maintenance downtime and required operator time.
- **Minimisation of heat input** and reduced heat affected zone (HAZ) – leads to safer rails with reduced embrittlement and extended lifetime.
- **Higher level of consistency and reproducibility** – fully automated or semi automated process.
- Increased **integrity** and **quality** of repair.
- **Cost savings** of around **50%** per kg of metal deposited achievable.



Time saving of up to 30 hours leads to significant cost savings

Stock Rail and Switchblades

Efficient fast welding solution



Why Welding Alloys?

- Consumables developed specifically for tramways and gauge corner restoration.
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- Able to customise solutions and offer technical expertise in developing welding procedures.
- Customer references across 5 continents.
- Manufacture of automated welding equipment to provide a complete on-site welding solution.
- Provide full training.
- Close work with OEM rail manufacturers to develop innovative and unique products.

Our products

Product name	Description
HARDFACE APRail-O* EN ISO 14700: T Fe9	Cored wires for gauge corner restoration. Austenitic structure up to 46 HRC.
HARDFACE TLN-O HARDFACE TN-O EN ISO 14700: T Fe3	Flux cored wire containing Ni for the build-up for the build-up of rail heads, rail ends, switch points and carbon steel crossings. Hardness 300-350 HB.
TRI S RW EN ISO 14700: T Fe10	Flux cored wire developed for butt - welding of all rail types. May also be used for surfacing.

Applicable on all UIC/EN rail grades

*Available open arc, sub merged and electrodes



Switchblade requiring refurbishment



After welding and grinding



Part refurbished in the workshop



Switchblade fully refurbished in the workshop using open arc welding

Tamping tine rebuilding

Efficient lifetime extension



Weld rebuilding vs. replacement

Tamping is an essential part of track maintenance, used to pack the ballast under sleepers, to correct track alignment and ensure the track is parallel and level. The service life of the tamping tines/tools has a fundamental influence on the economic efficiency of this maintenance work; in general, tines are rejected after 15%-20% wear in their thickness/width. A long service life of the tines weld hardfaced with WA products ensures a consistent quality of tamping and reduced costs in the labour required for replacing the tines.

Features & benefits

- **Withstands extreme abrasion and impact forces**
- Extremely **hard, finely dispersed titanium carbides** lead to excellent results
- Extension in service lifetime
- Economical and automated hardfacing solution
- Customised cored wires to suit individual working environments



Tamping tine, courtesy of Plasser & Theurer

Tamping time rebuilding

Efficient lifetime extension



Why Welding Alloys?

- Consumables developed specifically for tramways and gauge corner restoration.
- Products approved worldwide.
- 45 years of experience in the manufacture of welding consumables.
- Able to customise solutions and offer technical expertise in developing welding procedures.
- Customer references across 5 continents.
- Manufacture of automated welding equipment to provide a complete on-site welding solution.
- Provide full training where required.
- Expertise in each application.

Our products

Product name	Description
HARDFACE TIC-O EN ISO 14700: T Fe8	Open arc flux cored wire designed specifically for the build up weld and protection of tamping tines. Contains extremely hard finely dispersed titanium carbides. HRC 57.
HARDFACE HC-O EN ISO 14700: T Fe15	Open arc flux cored wire designed specifically for the build up weld and protection of tamping tines. Highly abrasion resistant primary and eutectic chromium carbides deposit. HRC 58



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Portable MultiSurfacer™ FTR - Frog Top Rail Machine

Automated open arc rail welding machine



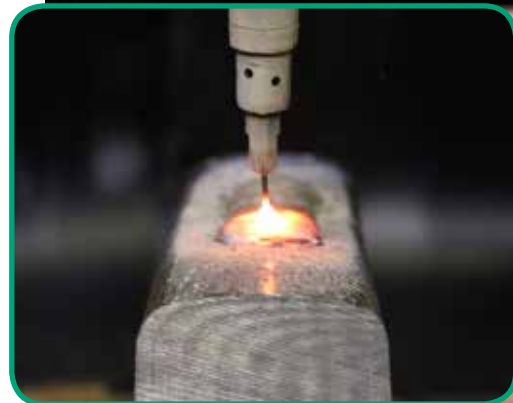
Automated weld restoration of worn frogs and rails offers a more cost effective approach to extend track lifetime compared to replacing worn frogs or track. Welding Alloys FTR machine, with pendant machine control technology, allows fully automated control of the welding process with little operator intervention.

Features

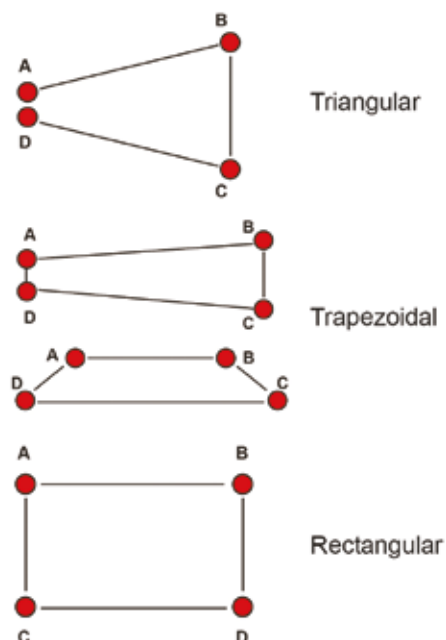
- Multiple modular configurations
- Touch screen pendant control system
- Lightweight
- Conforms to UCI standards
- Approved by SNCF

Benefits to You!

- Rail surface welding
- Frog hardfacing, different welding shapes possible - triangular, trapezoidal, rectangular
- Portable
- Huge reduction in costs, up to 80% savings with repair solution compared to replacement



Welding shapes



Specifications

- Two direction welding – no need to return the machine
- Automated welding with X,Y and Z axis - max. length 400 x width 200mm
- Track width - between 1420 – 1472 mm
- Conforms to Low Voltage Directive 2006/42 CE, norm NF EN 139777
- Motorised wheel with brake system – stops in case of emergency
- Weld up or down 1:10 gradients and 12 metre radius curves
- Manually operable clutch – minimises downtime by providing a fast return to the weld start position
- Automatic stick-out length adjustment



Touch screen pendant



Modular installation



HARDFACE TLN-O



HARDFACE APRail-O



HARDFACE 19 9 6-O

