



**SUPPLY, DELIVERY, TESTING OF 143 off WELDING
MACHINES AND 1 OFF GOUGING MACHINE FOR
VARIOUS BUSINESS UNITS IN DURBAN.**

**TRANSNET ENGINEERING,
DURBAN MAIN CENTRE, 311 SOLOMON MAHLANGU
DRIVE, ROSSBURGH.**

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DOCUMENT AUTHORITIES

TRANSNET



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1. INTRODUCTION / SCOPE of Work

This specification is for the:

#	TASK	REQUIRED
1	Supply	✓
2	Documentation	✓
3	Testing	✓
4	Training	✓
5	Commissioning	

#	ITEM	REQUIRED
1	Supply, delivery, testing of 143 off welding machines and 1 off gouging machine for various businesses units in Durban.	✓

2. SITE INSPECTION

- 2.1 All prospective contractors shall be required to undertake a compulsory site inspection to fully acquaint themselves with all aspects involved.
- 2.2 Arrangements to visit the site and confirmation of the date and time of the site inspection shall be made with Transnet Engineering Contract Manager.
- 2.3 The site inspection certificate shall be completed and countersigned by the Contract Manager on the day of the visit and must be submitted with the tender documents.

3. INFORMATION REQUIRED

- 3.1 Offers will not be considered unless full particulars and sufficient literature are provided at the tendering stage to enable Transnet Engineering Technical Officers the opportunity to assess each technical offer properly.
- 3.2 Prospective Contractors will complete the relevant questionnaire in full and must indicate whether their offer complies with each item of the specification
- 3.3 Should there be insufficient space for furnishing full details; contractors shall provide the additional details in their covering letter. The additional details shall be numbered in accordance with the applicable clause specified in the specification.
- 3.4 As prospective contractors are considered to be experts in their field, they are obliged to identify any shortcomings, such as omissions or sub-standard requirements, to the completeness of this specification. These must be brought to the attention of Transnet Engineering at tender stage with alternatives to address these shortcomings. However, each offer shall be quoted for separately.

4. TECHNICAL REQUIREMENTS

The following legislation must be complied with:-

- The Occupational Health and Safety Act – Act 85 of 1993.
- 4.1 Except where otherwise provided for in the specification, all equipment offered will comply with the requirements of the relevant standard specifications of the SABS, if published, otherwise with the relevant standard of the British Standards Institution in force at the time of tendering.
- 4.2 Where equipment offered complies with the recognized standards of the country of manufacture and not specifically with the standards required by this specification, such equipment will be considered at the discretion of Management. In this case, tenders shall state fully all respects in which the equipment departs from the standard laid down in this specification.
- 4.3 The successful tender will at the conclusion of the installation provide a document along the lines “that the installation complies with national/international requirements and that all selected /designed items are compliant with Act 85 of 1995 and SABS practices applicable to the installation. The equipment has been commissioned/ calibrated and employees as specified have been trained and found competent to operate the plant.”

5. SPECIFIC REQUIREMENTS

Any person with the intention of tendering shall ensure that the information below is complied with. The information or requirements below are binding and must be complied with.

- 5.1 Operational Parameters
- Refer to machine specifications.
- 5.2 Environment
- Indoors under dusty industrial conditions, and refer to section 11 for external conditions.
- 5.3 Specifications for the machines

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing “Yes” or ticking “✓”
5.3.1.1	This specification requirement covers the minimum requirements for supply, delivery, testing of 143 off welding machines and 1 off gouging machine for various business units in Durban.	
5.3.1.2	Each machine (welding machines and gouging machines) shall come as a pack containing accessories required to perform work (welding or gouging), with ease/convenience.	
5.3.1.3	The machines to be pre-calibrated and valid calibration certificates shall be submitted to the Project Manager. Only certificates meeting the SANAS calibration and certification requirements will be accepted.	
5.3.1.4	The welding machines shall come with 5m mains cable including the fitted plug for 400V, trolley with wheels, return cable with clamps, gas bottle platform, guide pin for the wire feeder and operating instruction manual.	
5.3.1.5	The plug shall be a 63A 400V 5 pin Marechal male plug.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.1.6	Safety standards: <ul style="list-style-type: none"> The bidder to supply and indicate the design standards of the welding machines. The bidder to indicate all safety features build into the machine. 	
5.3.1.7	The bidder shall include full description of the operation standards of the machine.	
5.3.1.8	Catalogues containing pictures and technical parameters/data to be attached in the bid documents, for the welding and gouging machines proposed by the bidder.	
5.3.1.9	The bidders must indicate the minimum power supply requirements (in Amps) for this machine to operate fully.	
5.3.1.10	Documentation: 3 sets off hard copies each with a memory stick containing documentation in PDF Format. <ul style="list-style-type: none"> Operating Manual. Maintenance Manual. Electrical Schematics. Mechanical Drawings. Parts List. Hard copy of software Programs. Setup guides for software on computer. Passwords for all software. Backup of software Programs. Backup Image of computer. 	

Tig welding machines (for RSE)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.2.1	Supply 10 off Tig welding machines.	
5.3.2.2	Mains voltage 400 V, 50 Hz AC supply	
5.3.2.3	<u>Primary current</u> Max current TIG 25 A, Max current MMA 32A.	
5.3.2.4	<u>Voltage/current range</u> TIG AC*/DC 4–430 A, MMA 16–430 A.	
5.3.2.5	<u>Permissible load at TIG</u> 40 % duty cycle 430 A / 27.2 V. 60 % duty cycle 400 A / 26.0 V. 100 % duty cycle 315 A / 22.6 V.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.2.6	Permissible load at MMA 40 % duty cycle 430 A / 37.2 V. 60 % duty cycle 400 A / 36.0 V. 100 % duty cycle 315 A / 32.6 V.	
5.3.2.7	Power factor at maximum current (TIG): 0.89 Power factor at maximum current (MMA): 0.89	
5.3.2.8	Efficiency at maximum current (TIG): 76 % Efficiency at maximum current (MMA): 80 %	
5.3.2.9	Operating temperature range -10 to +40 °C (+14 to +104 °F)	
5.3.2.10	Dimensions (l×w×h) approximately 0.625m × 0.394m × 0.776 m Mass approximately 95kg.	
5.3.2.11	The tig welding machine shall have suitable cooling system. The bidder to give details.	
5.3.2.12	H Insulation class, IP23 Enclosure class.	
5.3.2.13	The recommended product (Tig welding machines) is the Esab Tig4300iw AC/DC or equivalent tig welding machine or superior tig welding machine	

CO₂ welding machines (For RSE)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.3.1	Supply 80 off Welding machines	
5.3.3.2	Conduit: Power pack to wire feed 5 m, Wire feed to welding torch 10m.	
5.3.3.3	Mains voltage 400 V, 50 Hz AC supply.	
5.3.3.4	Control voltage 42V, 50 Hz.	
5.3.3.5	Permissible load at 60 % duty cycle 500A / 39V , 100 % duty cycle 400 A / 34 V.	
5.3.3.6	Setting range (DC) A/V MIG/MAG 20 / 14 - 500 / 39, MMA 20 / 21- 400 / 36.	
5.3.3.7	Open circuit Voltage 53V-60V, Open circuit power 550W (with cooling unit 750W) The welding machines shall have the water cooling system.	
5.3.3.8	Power factor at maximum current: 0.90. Efficiency at maximum current: 72%.	
5.3.3.9	Operating temperature range -10 to +40 °C.	
5.3.3.10	The welding machines shall come with 1.2mm rollers, contact tips and have water cooling method.	
5.3.3.11	Dimensions (l×w×h) approximately 0.830m × 0.640m × 0.835 m, mass approximately 194kg.	
5.3.3.12	H Insulation class, IP23 Enclosure class	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.3.13	The recommended product (CO ₂ welding machines) is the Esab Mig 502c or equivalent welding machine or superior welding machine.	
5.3.3.14	Supply 80 off wire feeders	
5.3.3.13	Power Supply voltage 42 V AC, 50Hz	
5.3.3.14	Rated supply current 6 A	
5.3.3.15	Settings data: Wire feed speed: 1.5–25.0 m/min, Creep start: OFF or ON, 2/4 stroke, Wire selection: Solid or Cored.	
5.3.3.16	Compatible with 1.2mm wire..	
5.3.3.17	Dimensions (l × w × h): approximately 675 × 265 × 418 mm	
5.3.3.18	Operating temperature -10° to +40°C	
5.3.3.19	Shielding gas : All types intended for MIG/MAG welding max pressure: 5 bar	
5.3.3.20	Permissible Load at 60% duty cycle 500 A, 100% duty cycle 400 A	
5.3.3.21	Push wire system.	
5.3.3.22	Enclosure class IP23	
5.3.3.23	The recommended product (Wire feeder) is the Esab feed 304w or equivalent Wire feeder or superior Wire feeder.	
5.3.3.24	Welding gun to have wire feed speed control.	

CO₂ welding machines and wire feeders (For PD-Jabu)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.4.1	Supply 6 off CO₂ Welding machines (6 off).	
5.3.4.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.4.3	Control voltage 42V, 50 Hz.	
5.3.4.4	Permissible load at 60 % duty cycle 500A / 39V , 100 % duty cycle 400 A / 34 V.	
5.3.4.5	Setting range (DC) A/V MIG/MAG 20 / 14 - 500 / 39, MMA 20 / 21- 400 / 36.	
5.3.4.6	Open circuit Voltage 53V-60V, Open circuit power 550W (with cooling unit 750W).	
5.3.4.7	Power factor at maximum current: 0.90. Efficiency at maximum current: 72%.	
5.3.4.8	Operating temperature range -10 to +40 °C.	
5.3.4.9	The welding machines shall come with 1.2mm rollers and contact tips and have water cooling method.	
5.3.4.10	Dimensions (l×w×h) approximately 0.830m × 0.640m × 0.835 m, mass approximately 194kg.	
5.3.4.11	H Insulation class, IP23 Enclosure class.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.4.12	The recommended product (CO ₂ welding machines) is the Esab Mig 502c or equivalent welding machine or superior welding machine.	
5.3.4.13	Supply Wire feeders (6 off).	
5.3.4.14	Power Supply voltage 42 V AC, 50Hz.	
5.3.4.15	Rated supply current 6 A.	
5.3.4.16	<u>Settings data</u> Wire feed speed: 1.5–25.0 m/min, Creep start: OFF or ON, 2/4 stroke, Wire selection: Solid or Cored.	
5.3.4.17	Dimensions (l × w × h): approximately 675 × 265 × 418 mm.	
5.3.4.18	Operating temperature -10° to +40°C.	
5.3.4.19	Shielding gas : All types intended for MIG/MAG welding max pressure: 5 bar.	
5.3.4.20	Permissible Load at 60% duty cycle 500 A, 100% duty cycle 400 A	
5.3.4.21	Push wire system.	
5.3.4.22	Enclosure class IP23.	
5.3.4.23	The recommended product (Wire feeder) is the Esab feed 304w or equivalent Wire feeder or superior Wire feeder.	

CO₂ welding machines and wire feeders (for Coaches)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.5.1	Supply welding machines (26 off).	
5.3.5.2	The welding machines shall come with 1.2mm rollers and contact tips.	
5.3.5.3	Mains voltage 400 V, 50 Hz AC supply.	
5.3.5.4	Control voltage 42V, 50 Hz.	
5.3.5.5	<u>Permissible load at</u> 60 % duty cycle 500A / 39V , 100 % duty cycle 400 A / 34 V.	
5.3.5.6	<u>Setting range (DC) A/V</u> MIG/MAG 20 / 14 - 500 / 39, MMA 20 / 21- 400 / 36 TIG 20 / 11- 500 / 30.	
5.3.5.7	<u>Open circuit</u> Voltage 53V-70V, Open circuit power 550W (with cooling unit 750W).	
5.3.5.8	Power factor at maximum current: 0.90. Efficiency at maximum current: 72%.	
5.3.5.9	Operating temperature range -10 to +40 °C.	
5.3.5.10	The welding machines air cooling method.	
5.3.5.11	Dimensions (l×w×h) approximately 0.835m × 0.640m × 0.835 m, mass approximately 194kg.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.5.12	H Insulation class, IP23 Enclosure class.	
5.3.5.13	The recommended product (CO2 welding machines) is the Esab Mig 502cw or equivalent welding machine or superior welding machine.	
5.3.5.14	Supply 26 off Wire feeders	
5.3.5.15	Power Supply voltage 42 V AC, 50Hz.	
5.3.5.16	Rated supply current 6 A.	
5.3.5.17	Conduit: Power pack to wire feed 5 m, Wire feed to welding torch 10m.	
5.3.5.18	Shall be Compatible with 1.2mm wire.	
5.3.5.19	The functionality of wire speed control to be on the welding gun.	
5.3.5.20	Settings data Wire feed speed: 1.5–25.0 m/min, Creep start: OFF or ON, 2/4 stroke, Wire selection: Solid or Cored.	
5.3.5.21	Dimensions (l × w × h): approximately 675 × 265 × 418 mm.	
5.3.5.22	Operating temperature -10° to +40°C.	
5.3.5.23	Shielding gas : All types intended for MIG/MAG welding max pressure: 5 bar.	
5.3.5.24	Permissible Load at 60% duty cycle 500 A, 100% duty cycle 400 A.	
5.3.5.25	It shall be Push wire system.	
5.3.5.26	Enclosure class IP23.	
5.3.5.27	The recommended product (Wire feeder) is the Esab feed 304w or equivalent Wire feeder or superior Wire feeder.	

Welding machines (for Wheels Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.6.1	Supply 3 off welding machines.	
5.3.6.2	Conduit: Power pack to wire feed 5 m, Wire feed to welding torch 10m.	
5.3.6.3	Mains voltage 400 V, 50 Hz AC supply.	
5.3.6.4	Control voltage 42V, 50 Hz.	
5.3.6.5	Permissible load at 60 % duty cycle 500A / 39V , 100 % duty cycle 400 A / 34 V.	
5.3.6.6	Setting range (DC) A/V MIG/MAG 20 / 14 - 500 / 39, MMA 20 / 21- 400 / 36 TIG 20 / 11- 500 / 30.	
5.3.6.7	Open circuit Voltage 53V-70V, Open circuit power 550W (with cooling unit 750W).	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.6.8	Power factor at maximum current: 0.90. Efficiency at maximum current: 72%.	
5.3.6.9	Operating temperature range -10 to +40 °C.	
5.3.6.10	The welding machines shall come with 1.2mm rollers and contact tips and have water cooling method.	
5.3.6.11	Dimensions (l×w×h) approximately 0.835m × 0.640m × 0.835 m, mass approximately 194kg.	
5.3.6.12	H Insulation class, IP23 Enclosure class.	
5.3.6.13	The recommended product (CO2 welding machines) is the Esab Mig 502cw or equivalent welding machine or superior welding machine.	
5.3.6.14	Supply 3 off wire feeders	
5.3.6.15	Power Supply voltage 42 V AC, 50Hz.	
5.3.6.16	Rated supply current 6 A.	
5.3.6.17	Settings data Wire feed speed: 1.5–25.0 m/min, Creep start: OFF or ON, 2/4 stroke, Wire selection: Solid or Cored.	
5.3.6.18	Dimensions (l × w × h): approximately 675 × 265 × 418 mm.	
5.3.6.19	Operating temperature -10° to +40°C.	
5.3.6.20	Shielding gas : All types intended for MIG/MAG welding max pressure: 5 bar.	
5.3.6.21	Permissible Load at 60% duty cycle 500 A, 100% duty cycle 400 A.	
5.3.6.22	Push wire system.	
5.3.6.23	Enclosure class IP23.	
5.3.6.24	Push pull system, functionality of wire speed control to be on the welding gun.	
5.3.6.25	The recommended product (Wire feeder) is the Esab feed 304w or equivalent Wire feeder or superior Wire feeder.	

Gouging machine (for Wheels Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.7.1	Supply 1 off gouging machine.	
5.3.7.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.7.3	Permissible load 60 % duty cycle 650 A/44 V, 100% duty cycle 500 A/ 39 V.	
5.3.7.4	Setting range (DC) MIG/MAG 20A/14V-650A/44V. MMA 20A/21V-650A/44V. TIG 20A/11V-650A/34V.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.7.5	Open circuit voltage: 53-57V, Open circuit power 670W (open circuit power with cooling unit is 870W).	
5.3.7.6	Control voltage 42V, 50Hz.	
5.3.7.7	Power factor at maximum current: 0.90. Efficiency at maximum current: 76%.	
5.3.7.8	Operating temperature range -10 to +40 °C.	
5.3.7.9	Water cooled.	
5.3.7.10	Dimensions (l×w×h) approximately 0.835m × 0.640m × 0.835 m, mass approximately 242kg (including cooling unit).	
5.3.7.11	The gouging machine shall come with the suitable cooling unit.	
5.3.7.12	IP23 Enclosure class.	
5.3.7.13	The recommended product (gouging machine) is the 1 x Esab gouging machine Origo Mig652c or equivalent gouging machine or superior gouging machine.	

Welding machines (for Bayhead Wagons Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.8.1	Supply 2 off welding machines.	
5.3.8.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.8.3	Shall save energy.	
5.3.8.4	Motor and other components protection.	
5.3.8.5	<u>Maximum Load</u> 100% duty cycle A/V, 3ph: 400/3. 60% duty cycle A/V, 3ph: 500/40.	
5.3.8.6	<u>Current Range</u> MIG/FCAW: 16-500A Stick (MMAW): 16-500A TIG: 5-500A.	
5.3.8.7	Efficiency at maximum current: 88%.	
5.3.8.8	Operating temperature range -10 to +40 °C.	
5.3.8.9	Dimensions (l×w×h) approximately 712mm x 325mm x 470H mm.	
5.3.8.10	IP23 Enclosure class.	
5.3.8.11	The recommended product (welding machine) is the Multi Process Warrior 500i C Welding Machine or equivalent welding machine or superior welding machine.	

Welding machine (for Bayhead Wagons Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.8.12	Supply 1 off Thermal arc thermodyne DC arc welder (CO ₂ welding machine) or equivalent welding machine or superior welding machine.	

Welding machine (for Bayhead Wagons Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.9.1	Supply 1 off inverter welder machine	
5.3.9.2	Item Type: Inverter Welder Welded Material: Aluminium Polarity: AC/DC Welding Process: TIG <u>Generator -</u> Amps: 300 Specs: 4801 Volts: 40 Duty cycle: 60% <u>Motor -</u> Hp: 20 Rpm: 1750 Phase: 3 Cycle: 60 Amps: 52/26 Input volts: 220/44 Approximate overall machine dimensions: 50" x 39 1/2" x 49 1/2".	
5.3.9.3	The recommended welding machine is a Hobart welding machine model no. M-300 (170 Amp Welding Machine) or equivalent welding machine or superior welding machine.	

Welding machine (for Bayhead Wagons Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.10.1	Supply 1 off CO₂ welding machine.	
5.3.10.2	Mains voltage 400 V, 50 Hz AC supply.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.10.3	Permissible load 100% duty cycle 280 A/28 V. 60 % duty cycle 365 A/32 V. 50 % duty cycle 400 A/34 V.	
5.3.10.5	Setting range (DC) 50A/16,5V-400A/34V.	
5.3.10.6	Open circuit voltage 17-45V, Open circuit power 360w (open circuit power with cooling unit 600w).	
5.3.10.7	Power factor at maximum current: 0.98. Efficiency at maximum current: 71%.	
5.3.10.8	Control voltage 42 V, 50 Hz.	
5.3.10.9	Operating temperature range -10 to +40 °C.	
5.3.10.10	Dimensions (l×w×h) approximately 0.812m × 0.552m × 0.925 m, mass approximately 142 kg (with cooling unit appr. 156kg).	
5.3.10.11	Dimensions (l×w×h) approximately 0.830m × 0.640m × 0.835 m.	
5.3.10.12	H Insulation class.	
5.3.10.13	IP23 Enclosure class .	
5.3.10.14	The recommended product (welding machines) is the Esab Origo Mig L405 or equivalent welding machine or superior welding machine.	
5.3.10.15	Supply 1 off Wire feeder.	
5.3.10.16	Power Supply voltage 42 V AC, 50Hz.	
5.3.10.17	Motor current I _{max} 3.5 A.	
5.3.10.18	<u>Settings data</u> Wire feed speed: 1.5-22.0 m/min, Bum back time 0-0.7s. Spot welding time 0.2-5s.	
5.3.10.19	<u>Max. diameter wire bobbin</u> 300mm.	
5.3.10.20	<u>Dimensions (l × w × h):</u> approximately 569 × 259 × 355 mm.	
5.3.10.21	<u>Operating temperature</u> -10° to +40°C.	
5.3.10.22	<u>Shielding gas</u> : All types intended for MIG/MAG welding max pressure: 5 bar.	
5.3.10.23	<u>Permissible Load at</u> 60% duty cycle 365A, 100% duty cycle 2800 A.	
5.3.10.24	<u>Push wire system.</u>	
5.3.10.25	<u>Enclosure class</u> IP23.	
5.3.10.26	The recommended product (Wire feeder) is the Esab feed L304 or equivalent Wire feeder or superior Wire feeder.	

Welding machines (for Bayhead Wagons Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.10.27	Supply 1 off welding inverter machine.	
5.3.10.28	Mains voltage 400 V, 50 Hz AC supply. Specifications Input Power: 400 AC 3Ph 50Hz. Rated Input Current: 15.4Amp. Open Circuit Voltage: 67V. Input Power: 400 AC 3Ph 50Hz. Rated Input Current: 15.4Amp. Open Circuit Voltage: 67V. Output Current: 40-400Amp. Duty Cycle: 60%. Power factor 0.93. Dimensions approximately (h x w x depth) 551mm x 260mm x 370mm.	
5.3.10.29	The recommended welding inverter machine is Thermamax 400D or equivalent welding inverter machine or superior inverter welding.	

Welding machine (for Rotating Machines Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.11.1	Supply 1 off welding machine.	
5.3.11.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.11.3	Current Range - 30 - 300Amps.	
5.3.11.4	DC Welding Current - 300A/32V.	
5.3.11.5	Open Current Voltage - 15/60V.	
5.3.11.6	Constant Current for DC TIG : Yes.	
5.3.11.7	Arc Force : Adjustable.	
5.3.11.8	Max Electrode Diameter: 6.3mm.	
5.3.11.9	Cooling: Fan	
5.3.11.10	Built-in Voltage Reducer : Yes.	
5.3.11.11	Dimensions (l×w×h) approximately 220mm x 200mm x 480mm.	
5.3.11.12	The welding machine shall come with 5m mains cable including plug for 400V and operating instruction manual.	
5.3.11.13	The recommended product (welding machine) is the Reflex 300AMP Arc Inverter Welder or equivalent welding machine or superior welding machine.	



Welding machines (for Rotating Machines Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.12.1	Supply 1 off welding machine	
5.3.12.2	Mains voltage 400 V, 50 Hz AC supply	
5.3.12.3	Shall save energy.	
5.3.12.4	Input Amperes: 76/38A.	
5.3.12.5	Output Volts: 36V.	
5.3.12.6	Output Amperes: 400A @ 60% Duty Cycle.	
5.3.12.7	Equipped With: Stick Holder, Ground Clamp, Cart with Caster.	
5.3.12.8	Dimensions approximately 48" L x 48" W x 72" H.	
5.3.12.9	The welding machine shall come with 5m mains cable including plug for 400V and operating instruction manual.	
5.3.12.9	The recommended product (welding machine) is the Gold Star 400SS Tig Rig or equivalent welding machine or superior welding machine.	

Welding machine (for Rotating Machines Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.13.1	Supply 1 off welding machine.	
5.3.13.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.13.3	Shall save energy.	
5.3.13.4	Input Amperes: 76/38A.	
5.3.13.5	Max open circuit voltage: 70V.	
5.3.13.6	Output power 25.6kw.	
5.3.13.7	Rated welding current(Amperes): 60% duty cycle, 3ph: 500A/40V.	
5.3.13.8	Welding current ranges 20-350 A, 25-625 A.	
5.3.13.9	Dimensions approximately 35" L x 22" W x 30" H.	
5.3.13.10	The welding machine shall come with 5m mains cable including plug for 400V and operating instruction manual.	
5.3.13.11	The recommended product (welding machine) is the Gold Star 400SS CY50 500A or equivalent welding machine or superior welding machine.	

Welding machine (for Rotating Machines Business)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.14.1	Supply 1 off welding machine.	
5.3.14.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.14.3	Output Range 50-400A.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.14.4	Rated Output 315/32.6V/100% Duty Cycle.	
5.3.14.5	Input Current @ Rated Output 51/48/24A . 48/24/20A.	
5.3.14.6	Dimensions (H x W x D) approximately 625 x 495 x 686 mm, mass 136kg.	
5.3.14.7	Lincoln mig welder CV3507 or equivalent welding machine or superior welding machine.	

Welding machines (for Locomotives Business - CNR)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.16.1	Supply 2 off welding machines.	
5.3.16.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.16.3	Fan cooled.	
5.3.16.4	Primary current I _{max} 28 A.	
5.3.16.5	No-load power 57 W.	
5.3.16.6	Setting range (DC). MIG/MAG 16 A / 14.8 V - 400 A / 34 V. MMA 16 A / 20.6 V - 400 A / 36 V. TIG 4 A / 10.2 V - 400 A / 26.	
5.3.16.7	Permissible load at MIG/MAG. 60 % duty cycle 400 A / 36.0 V. 100% duty cycle 300 A / 32.0 V.	
5.3.16.8	Permissible load at TIG. 60 % duty cycle 400 A / 26.0 V. 100% duty cycle 300 A / 22.0 V.	
5.3.16.9	Power factor at maximum current 0.95.	
5.3.16.10	Efficiency at maximum current 89.5 %.	
5.3.16.11	Open circuit voltage 55 V.	
5.3.16.12	Operating temperature: -10 to +40 °C .	
5.3.16.13	Enclosure class: IP23.	
5.3.16.14	Approximate dimensions l×w×h 613 × 257 × 445 mm.	
5.3.16.15	Insulation class H, Enclosure class IP23.	
5.3.16.16	The recommended product (welding machine) is the Mig4004i Pulse or equivalent welding machine or superior welding machine.	

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.16.17	Supply 2 off wire feeders.	
5.3.16.18	Supply Voltage 42 VAC.	
5.3.16.19	Supply Frequency 50 Hz.	
5.3.16.20	Wire Feed Speed Range 0.8 – 25.0 m/min.	
5.3.16.21	Wire Spool Capacity 18 kg.	
5.3.16.22	Max Spool Diameter 300mm.	
5.3.16.23	Dimensions , Lx W x H 690 x 275 x 420mm.	
5.3.16.24	Weight approximately 15 kg.	
5.3.16.25	Operating temperature: -10 to +40 °C .	
5.3.16.26	Enclosure class: IP23.	
5.3.16.27	The recommended product (feeder) is the ESAB Aristo Feed 3004 or equivalent feeder or superior feeder.	

Welding machines (for Locomotives Business - CNR)

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.17.1	Supply 1 off Tig welding machine.	
5.3.17.2	Mains voltage 400 V, 50 Hz AC supply.	
5.3.17.3	Fan cooled.	
5.3.17.4	Primary current (max) TIG 14 A, MMA 19 A.	
5.3.17.5	Setting range TIG 4 - 300 A, MMA 16 - 300 A.	
5.3.17.6	Permissible load at TIG Max output at 35% duty cycle, 300A/22,0V. Max output at 60% duty cycle, 240A/19,6V. Max output at 100% duty cycle, 200A/18,0V. Permissible load at MMA 30 % duty cycle 300 A / 32 V. 60 % duty cycle 230 A / 29.2 V. 100 % duty cycle 190 A / 27.6 V.	
5.3.17.7	Open circuit voltage, 67V.	
5.3.17.8	Shall have a liquid system.	
5.3.17.9	Current range TIG DC, 4-300A. Current range MMA DC, 16-300A.	
5.3.17.10	Operating temperature: -10 to +40 °C .	
5.3.17.11	Enclosure class: IP23.	
5.3.17.12	Weight, approximately 54 kg (cooling unit included), including the cooling unit 714 × 249 × 693 mm .	
5.3.17.13	The recommended product (tig welding machine) is the Esab Tig 3001i, TA24 or equivalent tig welding machine or superior tig welding machine.	



CO2 welding machines - Wagons Factory

ITEM	REQUIREMENTS	DETAILS OF OFFER Confirm Compliance by writing "Yes" or ticking "✓"
5.3.18.1	Supply 5 off Welding machines.	
5.3.18.2	Conduit: Power pack to wire feed 5 m, Wire feed to welding torch 10m.	
5.3.18.3	Mains voltage 400 V, 50 Hz AC supply.	
5.3.18.4	Control voltage 42V, 50 Hz.	
5.3.18.5	Permissible load at 60 % duty cycle 500A / 39V , 100 % duty cycle 400 A / 34 V .	
5.3.18.6	Setting range (DC) A/V MIG/MAG 20 / 14 - 500 / 39, MMA 20 / 21- 400 / 36.	
5.3.18.7	Open circuit Voltage 53V-60V, Open circuit power 550W (with cooling unit 750W).	
5.3.18.8	Power factor at maximum current: 0.90. Efficiency at maximum current: 72%.	
5.3.18.9	Operating temperature range -10 to +40 °C .	
5.3.18.10	The welding machines shall come with 1.2mm rollers and contact tips and have water cooling method.	
5.3.18.11	Dimensions (l×w×h) approximately 0.830m × 0.640m × 0.835 m, mass approximately 194kg.	
5.3.18.12	H Insulation class, IP23 Enclosure class.	
5.3.18.13	The recommended product (CO2 welding machines) is the Esab Mig 502c or equivalent welding machine or superior welding machine.	
5.3.18.14	Supply 5 off wire feeders.	
5.3.18.15	Power Supply voltage 42 V AC, 50Hz.	
5.3.18.16	Rated supply current 6 A.	
5.3.18.17	Settings data Wire feed speed: 1.5–25.0 m/min, Creep start: OFF or ON, 2/4 stroke, Wire selection: Solid or Cored.	
5.3.18.18	Dimensions (l × w × h): approximately 675 × 265 × 418 mm.	
5.3.18.19	Operating temperature -10° to +40°C.	
5.3.18.20	The welding machines shall come with 1.2mm rollers, contact tips and have water cooling method.	
5.3.18.21	Shielding gas : All types intended for MIG/MAG welding max pressure: 5 bar.	
5.3.18.22	Permissible Load at 60% duty cycle 500 A, 100% duty cycle 400 A.	
5.3.18.23	Push pull system.	
5.3.18.24	Enclosure class IP23.	
5.3.18.25	The recommended product (Wire feeder) is the Esab feed 304w or equivalent wire feeder or superior wire feeder.	
5.3.18.26	Supply 5 torches with the functionality of controlling the wire on the torch.	

- 5.4 Markings
- All labels and markings shall be indelible and only removable by deliberate intent.
- 5.5 Safety Features
- The machines shall have a fail to safety protection systems.
- 5.6 Testing
- All prescribed tests shall be carried out on equipment as well as the testing .
 - Transnet also reserves the right to carry out any check tests on the equipment.
 - Notwithstanding the successful completion of tests, the contractor will still be responsible for the efficient operation of the equipment.
- 5.7 Commissioning
- **A testing period of 1 month (744 hours for 24/7 shifts and 248 hours for 8 hour shifts).**
 - **No equipment will be accepted by Transnet without the satisfaction of the conditions above.**
 - The contractor shall be fully responsible for any damage caused to all supplied equipment to Transnet Engineering's assets during the supply, delivery, testing and commissioning. The supplier shall conduct a risk assessment as to identify anything that might hinder the installation of the required equipment.
- 5.8 Spares
- The successful tenderer shall supply Transnet Engineering with three sets of blown out diagrams and schematics of the complete machine as well as a detailed copies of the list of critical spares for all equipment including OEM numbers.
 - The tenderers shall indicate the availability and required lead times for the spares considered to be critical for the successful operation of the equipment.
- 5.9 Warranty
- The contractor shall undertake to repair all faults due to bad workmanship and/or faulty materials during a period of twelve calendar months, calculated from the date that the completed plant installation is accepted by Transnet Engineering.
 - Any latent defects that become apparent during the guarantee period shall be rectified to the satisfaction of Transnet Engineering at the cost of the supplier.
 - The contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days of being notified of such defects.
 - **The equipment shall come with 1 year warranty.**
- 5.10 After-Sales Service
- The successful tenderer shall provide Transnet Engineering with acceptable proof that spares can be easily and speedily procured for the equipment within 7 working days through agents locally.

The following must be supplied on handover of the machines:

- Performance Test certificate.
- Certificate of calibration.
- Electrical, electronics and mechanical schematic drawings for all components.
- Three (3) maintenance manuals and parts catalogues shall be supplied in hardcopy format with a CD of manuals in PDF format with each set.
- Three (3) operating and maintenance manuals and schedule for all components shall be supplied in hardcopy format with a CD of manuals in PDF format with each set.
- Operator and Maintenance staff training for less than three people.



- All required software (Soft copies).

Note: All work to be completed in each respect by suitably qualified person

6. HEALTH AND SAFETY REQUIREMENTS

- 6.1 All equipment and installation whether detailed in this specification or not shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 as amended by applicable local authorities. All equipment shall be designed to fail to safety. Sudden power losses must not have an adverse effect on equipment and shall not unduly delay return to operation after power is restored.
- 6.2 All the necessary safety equipment such as guards over rotating equipment shall be supplied and the equipment shall comply fully with all the requirements of the South African Occupational Health and Safety Act, Act 85 of 1993. At all times during the manufacture, assembly and testing of the equipment the contractor will be responsible for the safety of all persons on site and the equipment.

6.3 Safety Induction:

Prior to establishing on site, it is an explicit requirement of this contract that all of the Contractor's personnel directly involved with this contract, including those of sub-contractors, attend a Safety induction course. Transnet will provide the course free of charge and attendance is compulsory for all personnel under the control of the Contractor who, during the duration of the contract, will be present on site whether on a full time or adhoc basis.

The contractor must allow for all additional charges because of these requirements as no claims for extras whatsoever will be entertained in connection with the foregoing. A safety file and associated requirements shall be communicated to the successful tenderer.

6.4 Risk Assessment:

The successful contractor is required to conduct a Risk assessment to ascertain all potential risks associated with this project. The completed risk assessment is to be formally submitted to the Risk department via the project manager at least two weeks prior to the commencement of the actual project.

7. SPECIALIST SUB-CONTRACTORS

- 7.1 Only specialist sub-contractors who have previously successfully completed work of the type and extent specified in this document should be engaged.

The tenderer shall provide the technical officer with sufficient proof of having suitable experience regarding the design and manufacturing of similar equipment. To this end, complete and detailed reference list shall be submitted with the tender. Reference list shall include addresses as well as contact person who may be visited for inspection of the equipment during the adjudication period.

- 7.2 The tender shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.
- 7.3 The tenderer shall be prepared to commit themselves in writing to the technical officer with an adequate, experienced and stable project team for the duration of the contract.

7.4 Transnet Engineering will not consider any Tenderer's offer that, in the sole opinion of Transnet Engineering, does not have adequate experience in the design and manufacture of such equipment.

7.5 Contractors shall do the installation simultaneously with other contractors on-site busy with other work and shall plan work that it integrates with other work performed.

8. MATERIAL AND WORKMANSHIP

8.1 Machinery shall be offered complete in all respects, including all standard Equipment normally offered by manufactures, all of which shall be specified in detail.

8.2 The equipment, as made and supplied, shall be complete in every respect, of modern design, using the most advanced proven technology extensively supported by reputable local companies, and be built to good engineering practices.

Tenderers shall supply a list of all the main components (mechanical, electrical etc.) proposed as well as the addresses of the local support companies.

8.3 All parts and components shall be adequately protected against damage and corrosion during shipping, transport and storage.

Should any of the items called for be standard equipment, then the words "Standard Equipment" shall appear against the item.

NB: Tenderers shall indicate clause-by-clause either that they comply in every respect with the specific requirements, or if not, exactly how it differs.

9. DEFINITIONS AND ABBREVIATIONS

CLIENT	Transnet Engineering Durban
TECHNICAL OFFICER	Project Manager, Transnet Engineering Durban
CONTRACTOR	Contractor appointed under this specification document
SABS	South African Bureau of Standards
Duty Cycle	Refers to the time as a percentage of a ten-minute period that you can weld at a certain load without overloading.
FEM	Federation of European Mechanical Handling Standard
ISO	International Organisation for Standardisation

10. GENERAL

10.1 The successful tenderer will be subjected to a workshop inspection by Transnet Engineering, to ensure that the facilities are to the satisfaction of the Transnet Engineering in terms of the quality control and equipment capabilities for manufacturing such type of equipment.

10.2 The tenderers shall guarantee that the rating and size etc. of the equipment offered, will be adequate to perform the duties required.

11. SITE ESTABLISHMENT

- 11.1 The contractor shall be solely responsible for safety of his staff and for providing security to safeguard his works and material on site, until such a time.
- 11.2 The contractor shall be required to attend site meetings when convened by the Project Leader controlling the contract.
- 11.3 The contractor shall be responsible for any damages caused by his staff to the building and civil works on site.

12. PENALTY CLAUSES

- 12.1 Due to the criticality of this project, penalties will be levied for late deliveries.

14. TENDER EVALUATION CRITERIA

The following criteria will be used to award the tender. Should there be a criteria over and above the listed below, that will be used, such criteria will be specifically stated.

Technical evaluation criteria

No.	Technical Evaluation Criteria	Weightings	Scoring guideline						
14.1	<p>The methodology, standards and working procedures that will be used in the execution of this contract (detailed written process and project plan to be supplied by the bidder):</p> <p>The methodology that will be used in the execution of this contract is provided</p> <p>A process /project plan for the execution of this contract is provided.</p>	10 points	<p>As the response from the supplier / service provider</p> <table><tr><td>Methodology and process / project plan provided and fully detailed (very clear)</td><td>10 points</td></tr><tr><td>Methodology and process / project plan not provided</td><td>0</td></tr><tr><td colspan="2">• Where any of the required documents are not submitted, 0 points will be allocated.</td></tr></table>	Methodology and process / project plan provided and fully detailed (very clear)	10 points	Methodology and process / project plan not provided	0	• Where any of the required documents are not submitted, 0 points will be allocated.	
Methodology and process / project plan provided and fully detailed (very clear)	10 points								
Methodology and process / project plan not provided	0								
• Where any of the required documents are not submitted, 0 points will be allocated.									
14.2	<p>Compliance to scope of work</p> <p>Adherence to TE specification (read, all tables for compliance filled in, compliance confirmed by writing “yes” or by ticking in relevant boxes and signed off all the pages and attached in the tender document)</p>	60 points	<p>Completed and signed off the scope of work / specification</p> <table><tr><td>Specification returned (complete and signed off)</td><td>60 points</td></tr><tr><td>Specification returned but not fully completed, not signed off on all the pages</td><td>0</td></tr></table>	Specification returned (complete and signed off)	60 points	Specification returned but not fully completed, not signed off on all the pages	0		
Specification returned (complete and signed off)	60 points								
Specification returned but not fully completed, not signed off on all the pages	0								
14.3	<p>Experience</p> <p>Specific knowledge of supplying, delivery and testing of welding machines:</p> <p>Previous experience of supply, delivery and testing of industrial welding machines in the past 10 years, with contactable references on a letter head of the company</p>	30 points	<p>Two (2) contactable references, in the format of letters on client’s letterhead submitted = 30 points</p> <p>One (1) contactable references, in the format of letters on client’s letterhead submitted = 15 points</p> <p>Zero (0) /no reference letters submitted = 0</p>						
Total Weighting:			100 points						
Minimum qualifying score required:			70 points						