



Government of India - Ministry of Railways
RESEARCH DESIGNS & STANDARDS ORGANISATION

DOCUMENT NO.TDG 0017, Rev. '1'

**Item specific guidelines for vendor approval /
extension of approval for manufacture of AT welding
portions and execution of AT rail joints**

Price: Rs. 1200/-

TRACK DESIGN DIRECTORATE
RESEARCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW – 226011

A. ITEM SPECIFIC GUIDELINES FOR VENDOR APPROVAL/ EXTENSION OF APPROVAL FOR MANUFACTURE OF ALUMINO-THERMIC (AT) WELDING PORTIONS AND EXECUTION OF AT RAIL JOINTS

1.0 The policy for according approval and up-gradation to the manufacturers of A.T. welding portions and execution of welded joints is as under:

2.0 Initially, the firm will approach RDSO for approval of their firm for manufacturing of AT portions and welding of rail joints. The firm will be issued capability and capacity assessment proforma for submission which they will submit, to RDSO in triplicate duly filling up all the details required in the proforma. The proforma submitted by the firm, shall be scrutinized for adequacy of plants and equipments. Thereafter firm's premises will be visited for verification of various details as given in the proforma. The vendor will be accorded clearance for development of AT welding technique after capacity and technical capability assessment of manufacturing and testing facilities available in the firm premises, are found satisfactory.

3.0 Enlistment of firms in Part II

The firm would be brought in the list of "Part II firms" for a particular welding technique for a period of two year after fulfillment of the following stipulations with regard to development of welding technique as given in Indian Railway Standard Specification for fusion welding of rails by Alumino-Thermic Process, IRST 19-1994 or latest along with latest correction slips:

- (i) Laboratory Evaluation being satisfactory
- (ii) Fatigue testing being satisfactory
- (iii) Successful completion of field trials.

4.0 Up-gradation of firms from Part II to Part I

The firm would be considered for up-gradation to the list of Part I firms for that particular welding technique for a period of five years, after fulfillment of following conditions and other norms laid down as detailed in General Guidelines for Vendor Approval (Latest Revision):

- i) The firm has been on approval list in Part II category for a period of two year
- ii) Approval of the QAP by RDSO
- iii) Possessing of ISO certification for manufacture and supply of AT portion
- iv) Performance in field being in general satisfactory.
- v) Having supplied/executed minimum quantity including supply of AT portion and execution of AT welds for various rail section/chemistry

52 Kg 90UTS	60 Kg 90UTS	60 Kg HH	52 Kg 72UTS	90R 90UTS	90R 72UTS	75R 72UTS	75R 90UTS	60R. Conv.	60 Kg 90UTS 75mm	52 Kg 90UTS 75mm	60Kg /52Kg Comb.
1000	1000	500	1000	100	1000	500	100	500	100	100	100

5.0 Extension of approval

5.1 Re-assessment- In order to remain on list of approved suppliers, all AT portions manufacturing firms in Part I/Part II list shall be reassessed after every five years for AT portions and AT welding techniques for which the firms are approved. In case of initial re-assessment of firm, date of reassessment shall be taken after completion of five years from the date of first welding technique approval in Part-II/Part-I. category. For assessment, all AT portions manufacturing firms will have to approach RDSO with inspection charges as per time frame stipulated in latest General Guidelines for Vendor Approval issued by QA Civil Directorate, failing which the firm will be liable to be temporarily de-listed with effect from date of expiry.

Effective From 11.02.08	Page 3 of 20	Document No. TDG 0017, REV '1'
--------------------------------	---------------------	---------------------------------------

For down gradation/delisting of name of firms and reinstatement of status of vendor, the procedure given in 'General Guidelines for Vendor Approval' shall be followed.

- 5.2** The decision of Executive Director/Track or Executive Director/QA Civil RDSO shall be final regarding vendor status in Part I or Part II or delisting/down gradation/up-gradation etc.

B. SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURING AND SUPPLYING OF ALUMINO THERMIC (AT) WELDING PORTIONS AND EXECUTION OF ALUMINO THERMIC RAIL JOINTS

1.0 Scope

This schedule covers the technical requirements for manufacturing & supplying of Alumino Thermic (AT) welding portions and execution of rail joints.

2.0 Requirements for manufacturing of AT welding portion

Vendors seeking approval/ extension of approval for manufacturing & supply of AT Portion and execution of AT rail joints, shall comply with all the requirements mentioned below:

- 2.1 The firm should have well illuminated and ventilated covered shed with sufficient height and space for various manufacturing activities i.e. roasting of ingredient in rotary kiln, weighing, sieving, automatic batching plant having adequate feeding channel including that for alloying element (mandatory after due date), portion mixing etc.
- 2.2 The firm should have separate identified areas for storing of different raw materials like Aluminum powder, nail chips, mill scale and other ingredients.
- 2.3 The firm should have a separate quality control laboratory for testing different parameters of Alumino Thermic Welding Portion like physical and chemical parameters.
- 2.4 The firm should have sufficient material handling facilities like trolleys, metallic trays etc.

3.0 Manufacturing facilities

The firm should have following machines/equipments:

- 3.1 The automatic weigh batching system should contain microprocessor controlled electronically operated weighing scales having adequate feeding channels for feeding ingredients of portion including alloying element. The unit shall be equipped with mixing machine which shall also be microprocessor controlled. The system should have provision for uninterrupted power supply for continuing the operation in case of power failure.
- 3.2 Kiln of adequate capacity for roasting the raw material namely mill scale and nail chips.
- 3.3 Electronically operated weighing machine of accuracy $\pm 0.5\text{gm}$ for weighment of alloying elements (only till such time automatic batching plant is not mandatory).
- 3.4 Storage hoppers of adequate capacity for storing ingredients like roasted mill scale, roasted nail chip, Aluminium powder, and Ferro Manganese etc.
- 3.5 Elevator & Screw Conveyor for feeding the material to storage hoppers.
- 3.6 The entire working area should be covered by hoist.

Effective From 11.02.08	Page 5 of 20	Document No. TDG 0017, REV '1'
-------------------------	--------------	--------------------------------

3.7 Mechanically operated sieving facility for screening mill scale to get the required size of mill scale.

4 Requirements for making rail joints:

Manufacturer shall have tools, plants and equipments as detailed at Annexure-I of this document.

5 Testing facilities

Manufacturer shall have testing facilities as per Item B of Annexure-I. Requirements of some of the testing equipments are detailed below:

- 5.1 Microprocessor based duly calibrated **Class one or better** (as per Clause 7 of IS 1828 part I : 2005 or latest) Transverse Load Testing Machine of capacity 200T (min) equipped with servo control valve with facility for **load rate control** to facilitate operation of machine through a personal computer from a safe distance from location of machine. The machine should be calibrated from time to time by NABL Accredited laboratory. The salient features of machine shall be as per Annexure –II.
- 5.2 Firm shall have duly calibrated Brinell Hardness Testing machine equipped with inbuilt camera for capturing image of indentation and capable of displaying image and measuring its size in fully automatic mode along with provision for displaying hardness as well. The system should have facility of storage of image and test results with details of sample. The salient features of Machine shall be as per Annexure –III.
- 5.3 The firm should have vacuum emission charged couple device/photo multiplier tube spectrometer with printing facility. However, in the intervening period the firm can have chemical testing laboratory for chemical analysis of raw material and finished product which shall contain Carbon Sulphur determinator (strohlein apparatus), chemical balance, hot plate, muffle furnace (1100°C capacity), electric oven and hygrometer (Humidity Recorder) of suitable range or alternatively In lieu of wet analysis laboratory, agreement with RDSO or NABL accredited testing laboratory for carrying out chemical analysis of product.
The chemical laboratory shall be of appropriate size, well illuminated and ventilated.
- 5.4 Firm shall have Digital Ultrasonic Testing Equipment complying with Specification No. M&C/NDT/129/2005 or latest of M&C Directorate of RDSO. This shall be procured from RDSO approved sources. Operator shall also be duly trained and certified by RDSO. The firm shall have in house macro/micro examination facility which shall include but not limited to following – microscope of magnification up to 500 X, magnifying glass of 10X/20 X, required chemicals and heating facility for weld piece.
- 5.5 The firm shall have facility for magnetic crack detection test to detect surface cracks.
- 5.6 Firm shall have calibrated measuring instruments like vernier caliper, scale etc.
- 5.7 The vendor should have sand testing equipment like moisture teller, permeability meter, calibrated core hardness tester (scratch type), universal testing machine etc.

Effective From 11.02.08	Page 6 of 20	Document No. TDG 0017, REV '1'
-------------------------	--------------	--------------------------------

6.0 Quality control requirements:

- 6.1 There should be a system to ensure the traceability of the product from raw material stage to finished product stage.
- 6.2 One graduate engineer in metallurgical engineering to head quality control wing for manufacturing and testing of portions.
- 6.3 The Part-I vendor should possess ISO: 9001:2000 version certification in respect of manufacture and supply of AT Portion for their works and same shall be covered in the certification.
- 6.4 The vendor shall maintain proper analysis (chemical/statistical) of raw material as and when received and testing of AT Portions.
- 6.5 The vendor shall possess specification Indian Railway Standard Specification for fusion welding of rails by Alumino-Thermic Process IRST-19-1994 or latest along with up-to-date correction slips, Manual for Fusion welding of Rail by Alumino Thermic process - 1998 or latest along with up to date correction slips. General Guidelines and the Item Specification Guidelines and related IS/BS/ASTM standards.
- 6.6 The firm should have work instruction for manufacture of Alumino-Thermic portion.
- 6.7 The firm should have a quality manual indicating the extent of control over production and testing.
- 6.8 The firm shall possess quality assurance plan (QAP) for manufacture of AT portion detailing various aspects like-
 - 6.8.1 Organization chart
 - 6.8.2 Process flow chart
 - 6.8.3 Stage inspection details
 - 6.8.4 Various parameters to be maintained to ensure quality and process control
 - 6.8.5 Sampling stage, scale of sampling and inspection criteria
 - 6.8.6 Periodic calibration of testing and measuring instruments
 - 6.8.7 Disposal of rejected material.

The approved QAP must be a controlled document and a quality record of ISO quality control system of the vendor.

7.0 Documentation:

- 7.1 Manufacturing Process: The firm should have a system for documentation of the following:
 - 7.1.1 Incoming raw material register with TC reference of supplier as well as internal test results.
 - 7.1.2 Stage inspection and test results.
 - 7.1.3 Calibration records.
 - 7.1.4 Weighment record of raw material, portion etc.
 - 7.1.5 Month wise manufacturing records.
 - 7.1.6 Disposal of rejected product and its month wise record.
 - 7.1.7 Customer complaint registers showing cause of rejection and corrective action taken.

7.2 Execution of Weld:

7.2.1 The firm shall have a separate QAP for execution of AT Joints, detailing various aspects like -

7.2.1.1 Organization Chart

7.2.1.2 Quality checks to be exercised

7.2.1.3 Sampling of welds to check quality of welds.

7.2.1.4 Periodicity of training/refresher courses of welders

7.2.2 The firm shall maintain documentation related to execution of welds as indicated below :

7.2.2.1 Details of joints executed by individual welders indicating date, location, rail section, portion no., technique used USFD test result etc.

7.2.2.2 Details of welders employed with validity of competency certificate, welder code, type of technique for which approved etc.

7.2.2.3 Document supporting implementation of approved QAP on manufacturing of AT Portion and execution of rail joints.

7.2.2.4 Weld-wise record of joints failed during acceptance tests and thereafter including other reported deficiencies in the quality.

Note - The compliance of items in 7.2 shall be checked periodically by various official of RDSO during specified visits and not necessarily during reassessment.

8.0 Packing:

The firm should have adequate packing arrangement for portion like moisture proof bag of polyethylene of good quality heavy duty bag made of new cloth to IS: 187 and wooden/heavy duty corrugated card board /metallic container approved by RDSO.

9.0 Storage of portions

9.1 Stores should be dry, well ventilated, and where required lighting, power and running water should be available. In all cases building construction should be in compliance with the FIRE regulations applicable to the substances being stored. Consideration shall also be given to the relevant regulations issued in this respect. The appropriate notices should be displayed where materials such as Thermit Portions are stored.

9.2 Portions should be stored in a secure, non-combustible building. While it is preferable that they should be stored separately, they may be stored with other non inflammable materials, such as equipment and small tools, mould, luting sand in sealed bags, etc- in which case ideally they should be segregated. The store should be dry with ventilation to prevent excess humidity or dampness, and should be designated as a non-smoking area, with no naked flames.

9.3 Portion must not be stored in the same building where explosive or flammable items (e.g. fuel, fuel gases, igniters) are also stored.

9.4 The sealed boxes must not be opened until immediately prior to use. Any spillages should be immediately swept up and the material disposed in accordance with safety data sheets. Steel shovels should not be used on concrete floors, which might create a spark.

- 9.5 Proper notices should be displayed inside and outside the building together with the standard warning sign, which should read "Metallic Powder in case of fire **DO NOT USE WATER**".
- 9.6 The Local Fire Brigade should be informed of exact location of store and nature of contents. Only dry powder extinguishers of appropriate class should be used in the proximity of thermit powders.

10.0 Inspection area

The vendor shall have minimum inspection area preferably of size 12m X 6m for preparation of joints with adequate headspace, well illuminated and ventilated.

Annexure-I

Minimum facilities & machineries required for manufacture of Alumino-Thermic portions & welding of rail joints

S.No.	Description	Minimum Quantity
A. Manufacturing Machinery details		
1	Rotary Kiln	One No.
2	Power hacksaw	Two Nos.
3	Surface grinder	One No.
4	Weighing facility	Two Nos.
5	Sieving facility	One No.
6	Temperature measuring device	One No.
7	Portion mixer	One No.
B. Physical Testing facilities details		
1	Transverse testing machine (200T Min) (Annexure – I)	One No.
2	Brinell hardness machine (3000Kg) (Annexure – II)	One No.
3	Ultrasonic rail/AT Weld tester	One No.
4	Magnetic crack detection test	One No.
5	Macro/Micro examination	One No.
C. Chemical Testing facilities details		
1	Carbon Sulphur determination apparatus	
2	Chemical balance	One No.
3	Hot Plates	One No.
4	Muffle furnace	One No.
5	Barometer	One No.
6	Hydrometer	One No.
7	Water distillation Plant	One No.
8	The spectrometer: should have vacuum emission CCD/PMT spectrometer with printing facility <i>However before the cutoff date specified by RDSO agreement</i> with RDSO approved or NABL accredited Testing Laboratory for carrying out chemical Analysis of product will be considered as an acceptable arrangement	One No.
D1. Details of Preheating system (At least one system out of the three mentioned must be available with the manufacturer)		
1	Pressure tanks with pressure gauge complete	5 Nos.
2	Vaporizers (Burner) complete	5 Nos.
3	Nozzle prickers	10 Nos.
4	Nozzle keys	5 Nos.
5	Vaporizer stand	5 Nos.
6	Goose neck attachment to vaporizer	10 Nos.
D2 . Compressed Air Petrol Preheating		
1	Suitable compressor system	2 Nos.
2	Torch (burner) complete	2 Nos.
3	Torch (burner) keys	2 Nos.
4	Torch burner stand	2 Nos.
5	Goose neck attachment to vaporizer	2 Nos.

S.No.	Description	Minimum Quantity
D3 Oxy-LPG Preheating		
1	Oxy-LPG torch burner	2 Nos.
2	Oxygen cylinder with pressure Gauge	2 Nos.
3	LPG cylinder with pressure gauge	2 Nos.
4	Torch burner stand	2 Nos.
5	Connecting hose pipe	4 Nos.
E. Other Equipments		
1	Crucible complete-Crucible shell & crucible lining	6 Nos.
2	Crucible caps	6 Nos.
3	Crucible forks	6 Nos.
4	Crucible stands	6 Nos.
5	Crucible rings	6 Nos.
6	Mould pressure (clamp)	12 sets.
7	Cleaning rod round	2 sets
8	Tapping rod	2 Nos.
9	Straight edge 1m long	2 Nos.
10	Straight edge 10cm. long	2 Nos.
11	Aluminum/steel rod for thermal plugging	4 Nos.
12	Leather washers for pump	4 Nos.
13	Gap gauges for height gauge	2 Nos.
14	Filler gauge	2 Nos.
15	Tools for punching the marking	2 sets
16	Mould shoes	6 Pairs
17	Stop watch	1 No.
18	Pyrometer for measurement of rail temperature	1 No.
19	First aid box filled with medicines bandages, cotton etc.	1 No.
20	Mirror 150 x 100mm with handle	2 Nos.
i)	Hot sets (chisels) (for Emergency use only)	2 Nos.
ii)	Funnel tin (for pouring petrol)	1 No.
iii)	Adjustable spanner	1 No.
iv)	Hammer 1 Kg	1 No.
v)	Sledgehammer double pane 5 kg.	2 No.
vi)	Steel wire brush	2 No.
vii)	Blue goggles	2 pairs
viii)	Paint brush 50mm	1 No.
ix)	Slag container (bowl)	12 pairs
x)	Asbestos gloves	4 pairs
xi)	Hose clips	4 nos
xii)	Pliers	1 no
xiii)	Rail file 350x40x6mm (for Emergency use only)	4 nos
22	Weld trimmer (Cutter)	1 No.
23	Insulation hood for control cooling (for 110 UTS rail welding)	1 No.
24	Rail profile guided grinding trolley (Grinding wheel)	1 No.
25	Pattern	1 no. for each rail section
26	Sand Muller	1 No.
27	CO2 gassing facility	1 No.
28	Electric oven for drying the moulds	1 No.
29	Core-hardness tester	1 No.

Annexure –II

Technical Specification for Transverse Load Testing Machine (Class 1 or better as per IS 1828 part I: 2005)

- Capacity Not less than : 2000 KN
- Accuracy (Force measurement) : +/-0.5 % or better of indicated Force in the range of 40 kN to 2000 kN
- Accuracy of Displacement/ Deflection Measurement : 0.5 mm
- Maximum Clearance for Bending Test (Height of Rail that can be accommodated in machine) : 300mm

Automatic control modes - Load rate control
- Stress rate control

Data entry - Identification code
- Preload in KN
- Test termination load/displacement
- Test speed
- Selection of unit

Data output - Peak load
- Max. deformation at peak load
- Absorbed energy by the specimen from the start Of the test through to the end of the test
Load Versus Deflection

Control options - Manual control
- Control form PC through software
- Test speed for loading
- Load level for displacement logging reset to Zero
- Termination load

Interfacing facility - PC & Printer (for test data & results and statistics)

CONTROL:

Servo Hydraulic Control Valve providing nearly uniform Load control with facility of operation through computer panel located at a distance from Transverse Load Testing Unit.

MEASUREMENT:

1. PC Based measurement with dedicated Software
Feature:
 - Real Time (Online) graph
 - Digital Display of Current Test values

- Zoom
- Data Tracking
- Test Report for Transverse/Bending Test
- Report File Management.
- SPC Program with Fall Diagram.

2. Additional Facility in Software

The software system should be capable of preserving the Load Deflection diagram in computer memory. The software should facilitate auto incorporation of date and time of testing from computer memory and this data should be ineditable.

Annexure – III

Technical Specification for computerized Brinell Hardness Tester Capacity 3000Kgs

1. Description:

Computerized Brinell Hardness Testing Machine with Load Capacity of 3000 Kgs. Having camera to capture image of indentation with minimum following features -

- Indentation Image with auto date and time from system
- Identification mark of Sample under Testing
- Measurement of Hardness in Auto and Semi Auto mode along with manual measurement.
- Saved Image can be used for rechecking hardness of sample afterwards.
- PC based compatible with windows features

2. Purpose:

To take hardness on ferrous on Brinell Scale.

3. Technical Requirement:

S.No.	Description	Units	Requirement
1.	Total loads	Kgf	3000
2.	Magnification of object	-	2X and higher
3.	Max. Test height	mm	410
4.	Scale least count	mm	.01
5.	Measurement range	mm	1-6
6.	Indentor	mm	10

4.0 Additional Facility in Software

The software system should be capable of preserving the indentation image in computer memory. The software should facilitate auto incorporation of date and time of testing from computer memory and this data should be in-editable.

5.0 Other Requirements:

NABL certified standard blocks with hardness range of 200 to 360 BHN

C. PROFORMA FOR TECHNICAL CAPABILITY ASSESSMENT/REASSESSMENT FOR MANUFACTURE AND SUPPLY OF ALUMINO THERMIC WELDING PORTIONS

(To be filled in by the firm in triplicate. Attach extra sheets wherever necessary)

1. SECTION-1: GENERAL INFORMATION

- 1.1 Name of the firm
- 1.2 Address
 - (a) Head Office
 - (b) Works
 - (c) Location of works Km.
From Railway Station
- 1.3 Factory Area (Sq. m)
 - 1.1.1 Covered
 - 1.1.2 Uncovered
 - 1.1.3 Is the factory site in your name or on rental basis?
Support with documents.
 - 1.1.4 Telephone No.
 - (i) Head Office
 - (ii) Works
 - 1.1.5 Telegraphic address/Telex/Address/FAX address.
 - (iii) Head Office
 - (iv) Works
- 1.4 SSIC/NSIC Registration No (Enclose Copy)
- 1.5 Copies of the following documents to be enclosed:
 - Proof of ownership of Factory
 - Factory licence
 - Latest electricity bill
- 1.6 Power availability (KVA)
 - (a) General allotted capacity
 - (b) Standby generator and its capacity, If available.
 - (c) Name the party / person in whose name the power is sanctioned and your agreement with the part / person. (Support with documents)
 - (d)
- 1.7 Name of any other units located in the above premises.
- 1.8 Man Power Management:
 - (a) Managerial staff
 - (b) Shop floor Engineers / Supervisors
(Their Nos. with their qualifications and service experience)
 - (c) Laboratory In-charge whether full time or part time.
Indicate their names, qualifications and service experience.
 - (d) Inspection & quality control staff,

Give their name, qualifications and service experience.

- (e) Workmen
 - i) Highly skilled
 - ii) Semi-skilled
 - iii) Un-skilled.

1.9 Whether ISO certificate or not (enclose details)

- 2 Brief Description of Factory/Works
- a) Total land area (in sq.meter)
 - b) Total covered area (in sq.meter)
 - c) Different sub units, if any
 - d) Special feature , if any

3 Organisation (officers & staff)

3.1 Administrative /Managerial

S.No.	Name	Designation	Qualification	Experience
1				
2				
3				
4				
5				

3.2 Technical

S.No.	Name	Designation	Qualification	Experience
1				
2				
3				
4				
5				

3.3 Artisan/skilled.numbers

3.4 Unskilled.numbers

- 3.5
- a) No. Of shift/per day
 - b) No. Of hours/shift
 - c) No. Of working day/week
 - d) Weekly closed day

Name of sister concern, if any:

Section-II Technical Information

(A) Infrastructure for production and production capacity

1.0 Description of different departments in the factory/work:

2.0 Functions of each department:

3.0 Detailed description of Machinery/Tools

S.No.	Name of Machine	No.	Date of commissioning	Manufacturer/ supplier's Detail including make, model and serial Number wherever applicable
1	Automatic Weigh Batcher			
1	Rotary Kiln			
2	Power hacksaw			
3	Surface grinder			
4	Weighing facility			
5	Sieving facility			
6	Temperature measuring device			
7	Portion mixture			
8	Any other facility			

4.0 Details of Thermic welding equipment

A1 Details of Preheating system

(At least one system out of the three mentioned must be available with the manufacturer)

1	Pressure tanks with pressure gauge complete	5 Nos.
2	Vaporizers (Burner) complete	5 Nos.
3	Nozzle prickers	10 Nos.
4	Nozzle keys	5 Nos.
5	Vaporizer stand	5 Nos.
6	Goose neck attachment to vaporizer	10 Nos.
A2 Compressed Air Petrol Preheating		
1	Suitable compressor system	2 Nos.
2	Torch (burner) complete	2 Nos.
3	Torch (burner) keys	2 Nos.
4	Torch burner stand	2 Nos.
5	Goose neck attachment to vaporizer	2 Nos.
1	Oxy-LPG torch burner	2 Nos.
2	Oxygen cylinder with pressure Gauge	2 Nos.
3	LPG cylinder with pressure gauge	2 Nos.
4	Torch burner stand	2 Nos.
5	Connecting hose pipe	4 Nos.
A3 Other Equipments		
1	Crucible complete-Crucible shell & crucible lining	6 Nos.
2	Crucible caps	6 Nos.
3	Crucible forks	6 Nos.
4	Crucible stands	6 Nos.
5	Crucible rings	6 Nos.
6	Mould pressure (clamp)	12 sets.
7	Cleaning rod round	2 sets
8	Tapping rod	2 Nos.
9	Straight edge 1m long	2 Nos.
10	Straight edge 10cm. long	2 Nos.
11	Aluminum/steel rod for thermal plugging	4 Nos.
12	Leather washers for pump	4 Nos.
13	Gap gauges for height gauge	2 Nos.

14	Filler gauge	2 Nos.
15	Tools for punching the marking	2 sets
16	Mould shoes	6 Pairs
17	Stop watch	1 No.
18	Pyrometer for measurement of rail temperature	1 No.
19	First aid box filled with medicines bandages, cotton etc.	1 No.
20	Mirror 150 x 100mm with handle	2 Nos.
A4	Tool Box Containing	
i)	Hot sets (chisels) (for Emergency use only)	2 Nos.
ii)	Funnel tin (for pouring petrol)	1 No.
iii)	Adjustable spanner	1 No.
iv)	Hammer 1 Kg	1 No.
v)	Sledge hammer double pane 5 kg.	2 No.
vi)	Steel wire brush	2 No.
vii)	Blue goggles	2 pairs
viii)	Paint brush 50mm	1 No.
ix)	Slag container (bowl)	12 pairs
x)	Asbestos gloves	4 pairs
xi)	Hose clips	4 nos
xii)	Pliers	1 no
xiii)	Rail file 350x40x6mm (for Emergency use only)	4 nos
22	Weld trimmer (Cutter)	1 No.
23	Insulation hood for control cooling (for 110 UTS rail welding)	1 No.
24	Rail profile guided grinding trolley (Grinding wheel)	1 No.
A5	Other facilities	
1	Pattern	1 no.for each rail section
2	Sand Muller	1 No.
3	CO2 gassing facility	1 No.
4	Electric oven for drying the moulds	1 No.
5	Core-hardness tester	1 No.

(B) Quality Assurance

- 1 Does Manufacturer possesses an established quality assurance Program? if yes enclose a copy of it.
- 2 Details of quality assurance organization. Name of key personnel their qualifications, designation & position in over all management structure. (Explain with organizational chart if necessary).
- 3 Quality control & testing facility

3.1 Details of physical testing facilities

Sr.No.	Name of Machine	No.	Capacity	Date of commissioning	Manufacturer/ supplier's Detail including make, model and serial Number wherever applicable
1	Transverse testing machine				
2	Brinell hardness				
3	Spectrometer M/c				
4	Ultrasonic rail tester M/c				
5	Magnetic crack Detector <ul style="list-style-type: none"> • Magnaflux 				
6	Macro/Micro Examination <ul style="list-style-type: none"> • Magnifying Glass of 10X and 20 x • Microscope of magnification up to 500X. 				

3.2 Details of chemical analysis facilities

- Details of spectrometer
- Carbon Sulphur determination apparatus
- Chemical balance
- Hot plates
- Muffle furnace
- Barometer
- Hydrometer
- Water distillation plant
- Any other laboratory equipment

3.2.1 Calibration status of testing equipments

SN	Description of Machine	Date Calibration Done	of	Date Calibration due	Remarks
1					
2					
3					
4					
5					
6					
7					

(C) Details of Raw Material

Sr.No.	Description of the raw material	Supplier's Name	Test certificate of supplier
1			
2			
3			
4			

(D) CO2 pre-fabricated mould preparation

1.0 Equipments/machines required

S.No.	Description	No.	Capacity	Date of commissioning	Suppliers name & address
1	Pattern Equipment				
2	Sand Muller				
3	CO2 gassing facility				
4	Electric oven for drying the mould				
5	Core Hardness tester				
6	Core Shooter				

2.0 Raw Material used

3.0 Pattern of mould for different section of rails

(Guidelines for preparation of prefabricated CO2 mould will be supplied to the new vendors after initial inspection of their facilities)

(E) Details of AT welding techniques-using top pouring method (Short preheating welding process).

1. Parameters
 - 1.1 Rail section to be welded
 - 1.2 Type of rail
 - 1.3 Rail gap
 - 1.4 preheating time with preheating technique
 - 1.5 Reaction time & nature of reaction
 - 1.6 Type of mould
 - 1.7 colour of mould
 - 1.8 Rail face straightness before welding
 - 1.9 Rail end temperature after preheating
 - 1.10 Weight of portion
 - 1.11 Time lag between removal of burner & tapping of Thermit metal
 - 1.12 Mould waiting (opening) time
 - 1.13 Chipping time with use of trimmer
 - 1.14 Post weld treatment, if any
 - 1.15 weld metal chemistry from running rail top surface
 - 1.16 Reinforcement including weld metal dimensions

- 1.17 details of transverse breaking load (in tons)-Rail section wise
- 1.18 Details of load deflection (in mm)
- 1.19 Details of HAZ & Macro examination
- 1.20 Details of hardness values of parent rail weld metal & heat affected zone
- 1.21 Any other information

(F) Declaration

- 4.1 We do hereby declare that the above particulars are correct and no discrepancy shall be found during actual investigation before and during execution of order on our firm.
- 4.2 Any change in the plant and machinery and change of place of office and of works site shall be brought to the notice of RDSO for clearance and approval.
- 4.3 We also declare that our concern has not been black-listed by Railway / Railway Board/RDSO for business with the Railways.
- 4.4 We hereby undertake that all our equipments for manufacturing and testing as listed above shall be maintained in good working order at all times.
- 4.5 We hereby declare that the contents and the instructions of latest "General Guidelines for Vendors Approval" effective from have been read and understood by us and our firm shall agree/abide by all the stipulations laid therein.

Signature

Name in full of Signing Authority

Place:
Date:

Stamp of the firm.