

RAIL COACH FACTORY, KAPURTHALA

SPECIFICATIONS FOR AIRLESS SPRAY PAINTING MACHINE

Specification No. Mech/M&P/2700/GM/21

1.0 IMPORTANT INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID

- 1.1 Bidders are required to give clause wise comments on the technical specifications, confirming compliance/non-compliance with details of deviations if any along with their effect on the performance. Back references to be avoided, offers are likely to be ignored in case of non-compliance of these instructions for furnishing the information.
- 1.2 Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with international (CE/ISO/DIN/JIS)/National standards (IS) (where applicable).
- 1.3 Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
- 1.4 In case, any item is required in sets, please specify nos./pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
- 1.5 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.6 In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 1.7 The Purchaser may accept internationally accepted alternative specifications which ensure equal or higher quality than the specifications mentioned in the Technical Specification. However, the decision of the Purchaser in this regard shall be final.
- 1.8 Purchaser reserves the right to verify the details submitted by the bidder by actual site visits.
- 1.9 Other terms & condition of the contract will be as per Indian Railway Standard conditions of contract.

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2.0 DESCRIPTION AND SCOPE OF SUPPLY:

The specification covers design, manufacturing supply, commissioning and proving out of Airless Spray Painting Machine. For basic design features of machine, please refer clause 6.0 and its sub clauses. The supply shall include all concomittant accessories/equipment which the manufacturer consider essential to make the machine fully operational when installed and connected to air supply and other utilities. The requirement of utility etc. If any should be clearly indicated by the tenderer in their offer.

3.0 GENERAL DETAILS:

- 3.1 The equipment should be compact and portable.
- 3.2 The Airless Spray Painting equipment shall be capable of spraying all types of paints fillers, bitumen, coating material, lacquer, polyurethane paints and alike viscous materials on Railway coaches, components and sub-assemblies made of low alloy high tensile steel, chrome steel, mild steel and stainless steel.
- 3.3 It shall work on pneumatic pressure. It shall be compact unit with Airless Spray gun & Light Weight high pressure hose Pipe as per main parameter sr no 7 & 8 of para 5.0 Main characteristics and shall be easily portable on wheels.
- 3.4 The equipment should conform to the main characteristics listed in para-5 and machine features in para-6 of this specification.
- 3.5 The machine should be capable of operating in severe workshop conditions of dust temperature between 0°C to 50°C and for relative humidity of up to 98%.
- 3.6 It should be designed for high reliability and ease of maintenance. Any special feature facilitating ease of maintenance shall be explained.

4.0 SAFETY

- 4.1 The equipment shall incorporate safety devices for protection of the operator under normal operating conditions.
- 4.2 It shall be intrinsically safe to be used in hazardous area.
- 4.3 Details of safety features must be explained in the offer.
- 4.4 Hydraulic cylinder should have safety pins to prevent the threads from opening up under high pressure.

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5.0 MAIN CHARACTERISTICS

S.No	Characterstics	Value
1.	Fluid Air pressure Ratio	Minimum 50:1
2.	Maximum Fluid Outlet Pressure	350-360 bar
3.	Maximum air Inlet Pressure	100 psi
4.	Max Fluid out	40-50 Litres per minute
5.	Fluid output @ 60 cycles	13 to 15 Litres per minute
6.	Max. out put per cycle	230-250 CC
7.	Paint fluid hose pipe	30 meter light weight ¼ inch npt pipe with min. 3300 psi rating and weighing approx. 3 kg. Rating must be engraved on hose pipe.
8.	Spray Gun	Four finger operation to reduce the fatigue of operator, built in filter, light weight with safety lock, working pressure not less than 7250 psi (500 bar) with gun swivel.

6.0 MACHINE FEATURES

6.1 The Airless spray painting equipment including airless pump shall be mounted on a Trolley with a handle and on solid wheels for easy maneuverability and provided with two outlet for different types of application of machine.

6.2 The equipment shall be suitable for spraying the atomized materials under high pressure with least possible pollution effect, minimum bounce back and little over spray. It shall be able to produce a strong coating thickness with high performance characteristics.

6.3 Pump Features:

6.3.1 Hydraulic pump packing should provide good sealing and compatible with all types of paint coatings and solvents used for cleaning. Packing should be a combination of PTFE and leather for best chemical resistance and sealing.

6.3.2 Hydraulic pump should consist of a wet cup to fill with compatible liquid to prevent paint from drying on piston rod and wearing the packing.

6.3.3 Pump packing should be cartridge type and placed in a cartridge which does not require the entire pump to be taken into a workshop for repacking if required.

6.3.4 Hydraulic pump should have an outlet filter built in the pump system.

6.3.5 Hydraulic pump should have 2 outlets to enable two guns to be connected when

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two persons need to paint at the same time.

- 6.3.6 Hydraulic Pump second gun opening should be plugged with an insert to prevent collection of paint in the 2nd outlet when not being used.
- 6.3.7 Hydraulic pump piston and cylinder must be made of rust proof material like Nickel or hard chrome steel with plasma coating for max. Life.
- 6.3.8 Hydraulic pump should be provided with safety dump valve to release pressure from the pump.
- 6.3.9 Inlet port of hydraulic pump should be large to allow thick materials to be sucked with minimum suction loss.
- 6.3.10 Hydraulic pump cylinder and lubrication system must be covered with bellow.

6.4 Air Motor Features:

- 6.4.1 De-Ice control system should be inbuilt on the air motor.
- 6.4.2 Air motor cover should be made of corrosion resistant material.
- 6.4.3 Air motor and hydraulic parts should be separated by a chamber filled with liquid to clean and lubricate the piston. Ratio pump shall work only during actual spray operation.
- 6.4.4 Air motor should have inbuilt pressure reducing valve to adjust air pressure.
- 6.4.5 Air motor and Hydraulic pump should be connected with a quick disconnect coupling which is easy to operate and does not needs tools to operate.
- 6.4.6 Air motor shall operate on compressed air. Piston operation shall be controlled by a hard wearing pneumatic control system. Air pressure shall be adjusted by pressure reducing valve. Normally compressed air available on shop floor is 6.5 to 7.0 kg/cm² pressure.
- 6.4.7 Hydraulic part piston shall be driven by air motor. Double action reciprocating movement of piston shall develop requisite pressure on the spray material and ensure a continuous flow. Suction and exhaust valves made of special material shall cut in and cut out the flow.

6.5 Hose Features:

- 6.5.1 Air and fluid hoses shall be safe to withstand with the pump pressures. The maximum length of the hose, that can be used between the pump and the spray gun without any drop in the delievery pressure shall be indicated.
- 6.5.2 The inner layer of the hoses shall be resistant to spraying materials.

6.6 Spray Gun Features:

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- 6.6.1 Gun should be provided with inbuilt filter.
- 6.6.2 Gun swivel should be pressure rated and mentioned on the swivel.
- 6.6.3 The spray gun shall be provided with a trigger lock to prevent accidental triggering and a trigger guard to protect the nozzle.
- 6.6.4 The spray gun shall be supplied alongwith turn tip cleaner for easy maintenance.
- 6.6.5 Tip guard should hand tight and capable of withstanding high pressure. The pressure rating of the tip guard should be mentioned on the tip.
- 6.6.6 Whip hose should be flexible and able to withstand high pump pressure and create less fatigue to the operator while operation.
- 6.6.7 Spray Gun should have grooves to increase the grip. It should be light weighted, weighing not more than 850 grams.
- 6.6.8 The material of the packings and periodicity of their adjustment shall be indicated. The gun tips shall be of Tungesten carbide while the gun body shall be of stainless steel.
- 6.6.9 The gun shall be designed for a point deposition efficiency of at least 80% on flat surfaces.
- 6.6.10 Arrangement for cleaning the clogged tip shall form a part of the offer and shall be fully explained.
- 6.6.11 It shall be able to handle materials with pot life close to 30 minutes.
- 6.6.12 Working pressure of spray gun should not be less than 7250 psi (500 bar)
- 6.6.13 The operation of spray gun should be four finger to reduce the fatigue of operator.

6.7 Valve Features:

- 6.7.1 Pressure reducing regulator valve should be provided for adjusting air pressure.
- 6.7.2 Inlet ball seats should be reversible and made of Tungesten Carbide to increase life.
- 6.7.3 Inlet bass should be 1½ inch of high density to able to shut correctly and prevent backflow of material.
- 6.7.4 Inlet valve should be provided with shims to increase the height for heavy viscosity material.
- 6.7.5 Inlet valve should be quickly knocked down with large threads to allow easy and quick access to the intake valve for maintenance.

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6.7.6 Inlet valve shall be provided with an area to put a pad lock to lock the pump and prevent unwanted usage of the sprayer.

6.7.7 Suction Filter features:

- i) Suction Filter element should be made of Stainless Steel of mesh size 60.
- ii) Filter element screen should have marking of the mesh size on the filter to confirm the mesh size.

Suction Filter should be able to open from both side for ease of cleaning and flushing.

6.8 Machine Additional Features:

6.8.1 Data Track control system should be provided with machine. The system should provide the following information:

- Shut off pump when barrel is empty.
- Pump diagnostic.
- Material usage.

6.8.2 It should have integrated air controls that prevents any damage to the Air Regulator, Gauge and Filter.

6.8.3 The equipment shall be cart mounted with direct fluid supply from a container.

7.0 STANDARD ACCESSORIES

The scope of supply for each of the airless spraying equipment consists of :

a)	Every basic machine consisting of air motor, airless spray gun, fluid hoses, air controls and filters etc.	
b)	Airless high pressure spray gun with necessary accessories like gun swivel, nozzle tips of 0.013, 0.015 and 0.017 inch dia and guard	01 set
c)	Fluid tank of min. 25 ltr. Capacity	01 no.
d)	Air controls and filters	01 no.
e)	Dual Hose feed pipe of 30mtr. Length	01 set.(2nos.)

8.0 OPTIONAL ACCESSORIES

8.1 Any accessory, which in the opinion of the tenderer can contribute to higher production rates, should be indicated and quoted separately.

8.2 One tool kit for each machine is required.

9.0 SPARES

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9.1 Two lists of recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, hydraulic and

electrical equipments including controls on double shift working basis should be furnished and quoted for separately. The quantities should relate to, in case of non-perishable spares, to two years normal maintenance and in case of perishable spares to the duration of its shelf life or two years whichever is less. Shelf life should be indicated with the quotation for spares. The bidder shall also quote for consumables for two years operation of the machine indicating the number of hours of the machine operation taken for calculations.

9.2 Two year maintenance spares to be supplied alongwith the machine consisting of

i)	Pump Repair Kit	02 sets
ii)	Motor Repair Kit	01 set
iii)	Gun Repair Kit	02 sets
iv)	Hose pipe 30 mtr	01 no.
v)	Gun Swivel	02 nos.
vi)	Turn tip with nozzle	02 nos.
vii)	Nozzle tips set of 0.013, 0.015 & 0.017 inch dia	03 sets.

10.0 SPECIAL FEATURES

10.1 Special features incorporated in the system, if any, shall be indicated separately by the tenderer, clearly indicating advantages of the features.

11.0 DEVIATION:

11.1 Any deviation from the above stipulations shall be brought out clearly giving advantages of the proposed deviation and approval shall be taken from Dy.CPEIII/RCF before supply of material to RCF.

12.0 INSPECTION OF EQUIPMENT AND TESTING AT MANUFACTURER'S WORKS

12.1 A functional and performance test must be carried out at the manufacturer's works. Capability of the machine shall be demonstrated to the satisfaction of appointed Inspector or Inspecting Agency.

12.2 Manufacturer must have suitable facilities at their works for carrying out various performance tests on the machine. The tenderer shall clearly confirm that all the facilities exist and shall be made available to the inspecting authority.

12.3 A sample inspection chart for inspecting the machine shall be supplied alongwith

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the bid. The inspection charts should indicate all the tests that are carried out during the machine manufacture.

12.4 The tenderer will submit quality assurance plan being followed at the manufacturer's works for ensuring quality of the products offered.

13.0 TRAINING

13.1 Technical experts of the manufacturer during commissioning of machine will fully and adequately train operators/maintenance staff nominated by the consignee.

14.0 INSTALLATION, COMMISSIONING AND PROVING OUT TESTS

14.1 The supplier or his agent shall carry out a joint check at the consignee's end alongwith the consignee before unpacking is done to avoid subsequent complaints regarding short supply or transit damages. It is necessary that this joint inspection be done immediately on receipt of the machine by the consignee to avoid commissioning delays due to shortages/transit damages.

14.2 The contractor shall arrange Installation of the machine immediately after joint inspection of the machine or receipt of call for commissioning under the supervision of adequate number of technical experts.

14.3 The successful tenderer shall have to commission the Spray Painting Equipment within 30 days from the date of receipt of equipment at RCF, Kapurthala.

14.4 The successful tenderer shall have to prove out the Performance of Spray Painting Equipment on at least 10 (Ten) coaches shells on different applications.

15.0 ANNUAL MAINTENANCE CONTRACT.

15.1 Tenderers are required to quote separately for a comprehensive Annual Maintenance Contract for the machine supplied against this specification, which will be inclusive of all spares, material and labour costs. The duties and taxes as applicable should be indicated separately.

15.2 AMC agreement for each installation will be signed between the consignee and the tenderer if opted for by the consignee.

15.3 The duration of AMC shall be 3 years from the date of expiry of warranty.

15.4 The tenderer must confirm willingness to offer AMC services at all consignee locations without any preconditions.

16.0 REFERENCE

16.1 The tenderer should provide satisfactory evidence, acceptable to the purchaser to show that he is a licensed manufacturer and has adequate plant and manufacturing capacity and has a "quality assurance programme." He should furnish a statement giving a list of supplies made by him in the last 3 years, of the machines offered by him or similar machines alongwith the

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purchaser's names and addresses, order number, date and quantity supplied and their performance certificates and whether the supplies were made within the delivery period. Supplier must have supplied at least three (03) same / similar machine in the last 5 years.

In the absence of the above information, the tender is liable to be rejected.

17.0 BOUGHT OUT ITEMS

17.1 The bidder shall furnish along with the offer a list of all critical items/sub-assemblies which are bought out by the bidder and proposed to be used, along with the manufacturer's name, brand and model. The successful bidder may be required to produce invoices to ensure genuineness of such products by the inspecting agency.

18.0 AFTER SALES SERVICE

18.1 The tenderer will clearly spell out in the offer, the facilities available with him or his agent for providing adequate after sales service any where in India during warranty and post warranty periods. Tenderer will also indicate the service organizations located at various places in India and the availability of trained staff, maintenance spares, consumables etc. at different centers in the country.

19.0 TECHNICAL LITERATURE:

19.1 One copy of the printed illustrative catalogue showing features of the machine and its elements must be enclosed with each copy of the bid.

19.2 The successful tenderer will have to furnish for each Machine 4 copies of spare parts catalogue giving the part List number of each component with exploded views and assembly drawings, maintenance manual, trouble-shooting guide, operational manual of the machine and all electrical circuit diagrams.

20.0 WARRANTY:

The warranty of the machine will be as per IRS conditions of contract.

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