

RAIL COACH FACTORY, KAPURTHALA

Specification No.	Description	Covering Page
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	

Designation	Name	Signature	Date	Level
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Issue/ Rev	Changes	Date

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	1 of 12	20.12.2017	

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) (wherever 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.

RAIL COACH FACTORY, KAPURTHALA			
Specification No.	Description	Page No.	Date
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	2 of 12	20.12.2017

2.0 PURPOSE

Portable Air Plasma Cutting Machine is required for cutting of stainless steel sheet thickness up to 06mm and corten steel/ mild steel sheet thickness up to 12 mm used in the production of LHB Coaches in Shell Assembly Shop.

3.0 DESCRIPTION AND SCOPE OF SUPPLY

- 3.1 The specification covers supply and commissioning of inverter based portable air plasma cutting plant comprising of power source with in-built high frequency unit, plasma cutting torch, positive lead and ancillary equipment. For basic design features of the machine/plant, please refer clause 5 and its sub-clauses and for general electrical equipment design refer Schedule-II. The supply shall include all concomitant accessories/ equipments as detailed in the specification and other concomitant accessories/ equipments, which the manufacturer consider essential to make the machine fully operational when installed and connected to power supply. The requirements of utilities etc. if any, should be clearly indicated by the tenderers in the offer.
- 3.2 The total value of the offer will be calculated on.
- i. The cost of the basic machine.
 - ii. Cost of the concomitant accessories according to tenderer specification.
 - iii. Cost of any other accessory treated as concomitant accessory.
 - iv. Application duties and taxes, insurance, freight and installation and Commissioning charges.

4.0 GENERAL FEATURES

- 4.1 Tenderer should provide a chart of speed of cutting, thickness & standard of quality of cut which shall be achieved.
- 4.2 The equipment should be portable and should be suitable for good quality cutting.
- 4.3 This plant is required for cutting of various coach components. This plant should be capable of withstanding intensive use for three shifts.
- 4.4 Leading Parameters :The capability of the machine should be as per Schedule-1. The bidder should also provide the technical parameters of the machine offered against clauses as given in Schedule-1 along with the bid.

5.0 BASIC DESIGN FEATURES

- 5.1 The general characteristics of the machine shall be as per Schedule-III.

5.2 Specific Characteristics :

5.2.1 Plasma cutting power source

- 5.2.1.1 The plasma cutting power source should be a drip proof enclosure constant current inverter based power source with stepless regulation of current. It should

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	3 of 12	20.12.2017	

be capable of operating at maximum continuous welding current at specified duty cycle (as per Schedule-I) without over-heating.

- 5.2.1.2 The power source should be suitable for working on 415 +/- 10% single phase and should be protected against over voltage and under voltage.
- 5.2.1.3 The power source should be provided with cooling fan for effective forced draft cooling. An automatic device, which must switch off the power source in the event of inadequate airflow, should be provided.
- 5.2.1.4 The power source unit should be systematically arranged in housing.
- 5.2.1.5 All control PCB is to be arranged in such a manner that it should be possible to remove or refix easily without affecting/disturbing any other parts and wiring.

5.2.2 Plasma Cutting Torch :

- 5.2.2.1 The torch should be suitable for cutting the thickness mentioned in Schedule-I of the specification.
- 5.2.2.2 The cutting torch should be 7-8 meter long air-cooled. It should be capable to withstand the rated current without overheating.
- 5.2.2.3 Outer cover of the torch should be of heavy duty to effectively protect the inner gas pipe.

6.0 CONCOMITANT ACCESSORIES

- 6.1 The machine shall be accompanied by the following concomitant accessories, the cost of which shall be included in the basic price of the machine. However, the cost of each item of following concomitant accessories should also be given separately in the offer.
- 6.2 Constant current power source with inverter based technology. It should be possible to do the infinitely variable cutting adjustments through the control provided on the unit.
- 6.3 The power source should have in-built high frequency unit for non contact plasma arc initiation.
- 6.4 The power source should have over voltage, under voltage protections.
- 6.5 The following indications/ controls should be available on the main panel of the plant.
 - a. The main panel should have suitable safety indicators. The power source should have cutting parameter adjustment through potentiometer available on the power source.
 - b. Thermal indicator for over temperature.
 - c. Mains voltage for indicating the input supply voltage.
 - d. Pressure fault indicator for any loss in the air/gas pressure.
- 6.6 A suitable positive lead with proper clamping arrangement should be provided with the plant.
- 6.7 The plant should have suitable plasma cutting torch of 7-8 meter length through which a high quality cutting can be achieved.
- 6.8 Any other concomitant accessories required to make the machine fully operational on installation when connected to mains power source must also be

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	4 of 12	20.12.2017	

included in the scope of supply and the cost of such accessories should be included in the basic price of the machine.

7.0 ESSENTIAL ACCESSORIES

7.1 The machine shall be supplied along with the following essential accessories/spares, the cost of which shall be included in the basic price of the machine. However, the cost of each item of following essential accessories/spares should also be given separately in the offer. The essential accessories/spares will include consumables like electrode, nozzle and torch head etc.

- 7.2 Spare control cards- One set per machine'
- 7.3 Spare Torch Body- 01 nos. per machine
- 7.4 Spare Air Plasma Cutting Torch- 01 no. per 3 machines
- 7.5 Spare IGBTs used in the power sources- 01 set per 3 machines
- 7.6 Spare electrodes – 10 nos. per machine
- 7.7 Spare Gas Nozzle- 10 nos. per machine
- 7.8 Spare Diffuser- 10 nos. per machine
- 7.9 De- Connector Plug- 01 no. per machine.

8.0 OPTIONAL ACCESSORIES

8.1 The optional accessories will include consumables like electrode, nozzle and torch head to be quoted separately. The individual cost each item should be indicated separately.

- 8.2 Spare Control Cards- 01 set per machine
- 8.3 Spare Torch Body- 03 nos. per machine
- 8.4 Spare Air Plasma Cutting Torch- 01 no. per 2 machines
- 8.5 Spare IGBTs used in the power sources- 01 set per 2 machines
- 8.6 Spare electrodes – 20 nos. per machine
- 8.7 Spare Gas Nozzle- 20 nos. per machine
- 8.8 Spare Diffuser- 20 nos. per machine
- 8.9 De- Connector Plug- 01 no. per machine.
- 8.10 Spare Pressure Gauge- 01 no. per 3 machine.
- 8.11 Solenoid Valve- 01 no. per 3 machines.

9.0 SPARES

- 9.1 The tenderer should furnish details of spares covered under warranty.
- 9.2 List of important spare parts and accessories with their part number and costing.
- 9.3 The tenderer should be furnishing the price list of spare parts required for two years normal maintenance of the equipment. Sources of supply of spares used other than that of manufacturer should be furnished by the tenderer.
- 9.4 List of recommended spares for normal maintenance after expiry of warranty period to till useful life of the equipment.
- 9.5 List of recommended consumables for two years shall be quoted separately.
- 9.6 Useful life estimated/expected for each equipment and its sub assembly should be indicated by the tenderers.

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	5 of 12	20.12.2017	

9.7 Spare parts availability for at least 5 yrs from date of supply

10.1 COMMISSIONING AND PROVING OUT :-

10.2 The Successful tenderer shall have to commission the machine within 30 days from the date of receipt of machine at RCF,Kapurthala.

10.3 The successful tenderer shall have to prove out the performance of the machine at RCF premises to the entire satisfaction of the consignee.

10.4 Installation of machine would be done under the supervision/ direction of firm's engineers. The contractor shall arrange commissioning of the machine after installation is done by the Indian Railway Staff. Adequate number of teams of technical experts shall be made available so that the commissioning delays are eliminated.

11.0 ELIGIBILITY CRITERIA

11.1 The tenderer shall be registered on IREPS website (www.ireps.gov.in) to participate in the tendering process.

11.2 The tenderer shall have established quality control system and organization to ensure adequate control at all stages of the manufacturing process.

11.3 The tenderer shall provide a performance statement giving a list of major supplies of same/similar equipments effected in last 5 years to the reputed organizations giving details of the order no. and date and the quantity supplied and whether the supply was made within the delivery schedule. Such period shall be reckoned from the date of opening of tender. Tenderer should also provide the prove out test certificate of his supply/supplies.

11.4 Tenderer not submitting the requisite information may note that his offer is liable to be ignored.

12.0 TECHNICAL LITERATURE

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

12.2 The successful tenderer will have to furnish, for each machine 2 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 including PCB circuits to the consignee directly within 3 months of placement of the purchase order. The bidder should provide a list of literature, they will supply along with the machine. The technical literature shall be provided for complete machine including imported and indigenously purchased components/ sub-assemblies.

13.0 SERVICING FACILITIES

13.1 Service facility in Punjab, Address and contract details including phone and fax no. to be provided. The facility should have the necessary equipments recommended by the manufacture to carry out preventive maintenance test as

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	6 of 12	20.12.2017	

- per guideline provided in the service / maintenance manual. Firm should provide list of equipment available for providing calibrations and routine maintenance support as per manufacturer.
- 13.2 Supplier will undertake for service repairs & replacement of any needed part as & when needed.
- 13.3 Maintenance contract to be quoted after the expiry of maintenance period quoted above with details of scheduled visits, part covered under contract & cost of parts not covered as well.
- 13.4 The tenderer shall clearly spell out in the offer about the facility available with him or his agent/dealer for providing adequate after sales service in Punjab during warranty period.
- 13.5 The tenderer shall also indicate the service organization located at various places in India and availability of trained staff, maintenance spares etc.
- 13.6 The contractor shall give a comprehensive spare part list with OEM details and price for all the sub systems.
- 13.7 The tenderer/contractor shall provide list of spares, consumables required for maintenance for 5 years after completion of warranty period
- 13.8 For maintenance during warranty following criteria shall be considered.
- A) Service engineer of the supplier shall be available for attending to the system faults during first 07 days after successful commissioning of equipments during 09.00 - 17.00 hrs on all working days including Saturdays.
- B) Service engineers shall visit RCF on quarterly basis thereafter till the end of warranty/extended warranty period for Preventive Maintenance at least for one full day at a time.
- C) In case of any breakdown affecting the performance of the system completely or partly, firm shall depute its service engineer as soon as and when informed by any suitable means like Fax, SMS or email possible after receiving such call.
- D) Breakdown period shall be calculated from 8 hours after it's reporting to the firm upto the time it is attended. If intimation to the firm is delayed from Railway's side, then the breakdown period calculation will start from the time by which it is reported to the firm.
- 13.9 Total up time of the system should be at least 90%. Up time shall be counted in following manner:-
- A) Total breakdown of less than 8 hours shall be ignored for the purpose of this calculation.
- B) Penalty may be imposed if the down time is more than 10% without any valid reasons. The levy of token penalty as deemed fit based on the merit of the case may also be consider as per clause 17 (b) of GCC -201.
- 13.10 Warranty period for part or machine shall be extended after completion of warranty period by the duration under which the part or machine remains under breakdown during warranty.

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	7 of 12	20.12.2017	

- 13.11 Tenderer shall provide list of spares, consumables required for maintenance for 5 years after completion of warranty period as per annexure-A
- 13.12 Tenderer shall provide expected life for the components of the system and provide the maintenance schedule required for 10years for as per annexure -A
- 13.13 Tenderer shall provide the service charges /per day/per man for deputing service engineer on the machine on requirement separately for Indian and Foreign engineer.

14.0 DEVIATIONS:

The tenderer should certify that the machine offered fully meets the specifications. Various design features incorporated in the machine to fulfil different technical and performance requirements should be fully explained in the offer. However, minor deviations from this specification, which do not effect or in any way interfere with the stipulated performance standards, or would result in improved safety/ reliability or would reduce recurring maintenance/ operating cost of the machine, can be considered for acceptance. The tenderer in such eventuality shall clearly indicate the details of the deviations and their implications.

15.0 SCHEDULE OF ANNUAL MAINTENANCE CONTRACT (AMC) FOR PERIOD OF 5 YEARS AFTER COMPLETION OF WARRANTY PERIOD

- 15.1 Tenderer shall provide proposal for 5 year Annual Preventive Maintenance schedule to be executed after completion of warranty period in the format as per annexure-B.
- 15.2 The firm shall maintain the machine in good working condition during the contract period and shall correct the fault or failures, repair or replace the worn or defective parts/equipment during the normal working hours of shop where the equipment has been installed. Unserviceable parts/equipment need to be replaced at no extra cost with brand new parts/equivalent or superior specification.
- 15.3 The firm shall respond by deputing service personal to oral / telephonic/ or other modes of intimation for repair and maintenance of the said machines **within 2 hours**.
- 15.4 The firm shall ensure that the machine is in proper working condition, to the full capacity, after repair and maintenance.
- 15.5 To have a timely supply of spares during AMC, the contractor shall furnish a total list of spares which should contain list of spares that shall be arranged by the firm, both chargeable, duly mentioning the charge against each item, and spares which shall be non-chargeable, and list of spares to be held by RCF.
- 15.6 The contractor shall clearly list-out the list of consumables required for day-to-day operation of the machine. It shall be the scope of RCF to arrange the consumables once the completion certificate is issued for the retrofitted machine.

RAIL COACH FACTORY, KAPURTHALA					
Specification No.	Description			Page No.	Date
Mech/M&P/3200/GM/06 Rev.- NIL	Portable	Air	Plasma	8 of 12	20.12.2017
	Cutting Machine				

- 15.7 The tenderer/contractor shall provide suitable standby when repairs exceeds 2 hours. When any equipment is taken for repair to the tenderer/contractor's premises suitable standby equipment should be provided.
- 15.8 Besides attending the breakdown calls, the firm shall attend to the corrective and preventive maintenance of the machines once in a month.
- 15.9 The AMC is valid for five years from the date of completion of the warranty period . No freight is admissible.
- 15.10 During the AMC period, whatever equipment is defective shall be handed over to RCF. During completion of the AMC period the machines should be handed over in full working condition to its full capacity.
- 15.11 The firm should maintain a register duly indicating the nature of defects and repair attended and got signed by RCF authority. Preventive maintenance schedule should be made. The schedule should be made in such a way that more than one machine should not be attended on the same day. A copy of the schedule should be given to RCF at the beginning of the AMC and the schedule should be strictly followed and on carrying out the preventive maintenance the same should be entered in the register and got signed by RCF authority.
- 15.12 AMC charges shall be paid quarterly as one quarter of the total AMC charges applicable for that year on submission of bills duly certified by the engineers in charge with regard to the satisfactory execution of AMC during the period for which the bill is claimed. Duties & taxes as applicable at the time of payment shall be deducted at source.

ANNEXURE-A

S.N.	ITEM	PART NO.	SERVICE LIFE	PRICE

ANNEXURE -B

S.N.	YEAR	AMC CHARGES
1.	IST YEAR	
2.	IIND YEAR	
3.	IIIRD YEAR	
4.	IVTH YEAR	
5.	VTH YEAR	

- 16.0 **TRAINING**
 Technical experts of the manufacturer during commissioning of machine will fully and adequately train operators/ maintenance staff nominated by the consignee including repairs of electronics gadgets, sub-assemblies and Printed Circuit Boards up to component level.
- 17.0 **SPECIAL FEATURES**
 Special features incorporated into the machine, if any shall be indicated separately by the tenderer, clearly indicating the advantage of these features.

RAIL COACH FACTORY, KAPURTHALA			
Specification No.	Description	Page No.	Date
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	9 of 12	20.12.2017

17.0 MAKE

- 17.1 The supplier shall furnish the complete details of Model No. Make & Manufacturer's details/ address, Country and authorization details of Dealership.
- 17.2 The firm shall provide the calibration certificate of National / International Traceability along with validity of at least two years.

18.0 WARRANTY

The warranty condition of contract will be as per IRS conditions or as quoted by the tenderer whichever is later.

RAIL COACH FACTORY, KAPURTHALA			
Specification No.	Description	Page No.	Date
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	10 of 12	20.12.2017

SCHEDULE-I

S.No.	Description	Details
1.	Type	Constant current Inverter based Air Plasma Cutting Machine
2.	Input power supply	415 V, 50 Hz, 3- Phase AC Power supply +/-10%
3.	Out put current range	10 to 50 Amp., continuously adjustable
4.	Output Voltage	100-135 V
5.	Open circuit voltage	260 volt DC or above
6.	Input power	10 KVA
7.	Duty cycle	50 Amp. at 100% duty cycle
8.	Min. Air pressure	4-6 Kg/cm ²
9.	Air Flow	110 l/min
10.	Cutting Capacity	Stainless Steel-06 mm. Corten/Mild Steel :12mm
11.	Input power cable required	4 X 10 mm ² copper flexible 20 meters long.
12.	Length of air plasma torch	7 to 8 meters.
13.	Cooling	Forced Air
14.	Weight	Not more than 22 kg (App.)
15.	De- Contactor Plug	63 Amp. Model "DS6A7A1" make BCH only.

Note: Tenderer to furnish following detail of the Portable Air Plasma Cutting Machine offered

S.no.	Technical Parameter	Offered by Tenderer

RAIL COACH FACTORY, KAPURTHALA			
Specification No.	Description	Page No.	Date
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	11 of 12	20.12.2017

SCHEDULE-II

1.0 GENERAL SPECIFICATION (ELECTRICAL)

1.1 The provision of this general specification shall apply.

1.2 All equipments and material shall comply with appropriate Indian Standards (latest) or National Standards of the country of origin provided the latter are equivalent to or better than the former. For items for which Indian Standards are not published, National Standards shall be acceptable. The tenderer shall indicate the Standards applicable. The following standards are applicable in particular.

(Corresponding International Standards like ASA, MEMA, DIN etc. may also be quoted).

IS: 325-1979 (latest) - Three phase induction motors (corresponding to IEC Pub-34-1) latest.

IS: 1240 (latest) - Direct acting indicating analogue electrical measuring instruments and their accessories (corresponding to IEC Pub-51) (latest).

IS: 1271-1965 (latest) - Classification of insulation material for elect. Machinery & apparatus in relation to their thermal stability in service (corresponding to IEC-Pub-85) (latest).

IS: 6875 (latest) - Push buttons and related control switches (corresponding to IEC Pub/73) (latest).

IS: 375-1963 (latest) - Marking and arrangement of switch gear, bus bars, main connection & Auxiliary wiring.

IS: 996-1979 (latest) - Single phase small A.C. and universal electrical motors.

IS: 2516 (latest) - Circuit breakers (corresponding to IEC Pub-56) (latest).

RAIL COACH FACTORY, KAPURTHALA				
Specification No.	Description	Page No.	Date	
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	12 of 12	20.12.2017	

SCHEDULE-III GENERAL CHARACTERISTICS

1.0 RIGIDITY AND STABILITY :

- 1.1 The change in ambient temperature shall not affect the performance of the machine.
- 1.2 There shall be no change in the performance of the machine either on switching on the machine or after continuous running.

2.0 SAFETY CONTROLS :

- 2.1 The machine shall incorporate safety devices to provide protection to the operator and machine against all possible operational and machinery failures.
- 2.2 Suitable interlock shall be provided to prevent machine operations in the event of;
- i. faulty sequence of operation
 - ii. fluctuation in supply voltage
 - iii. resumption of power supply after power failure.

3.0 MACHINE MAINTAINABILITY :

- 3.1 The machine shall be so designed so as to require minimum possible maintenance and to give trouble free service.
- 3.2 All assemblies/parts of the machine shall be easily accessible for maintenance.
- 3.3 The machine shall not require major dis-assembly for checking and replacement of particular part, especially for parts requiring periodical check up and replacement.
- 3.4 The supplier shall furnish 3 sets of complete electrical and electronic wiring diagrams in full details to enable the maintenance staff to locate faults in the circuits, 3 sets of part catalogues, maintenance manuals operating instructions with details of coils and windings used in the equipment to facilitate repairs and maintenance should also be supplied.

4.0 POWER SUPPLY :

- 4.1 The machine should be suitable for operation on 415V +/-10% at 50 +/- 3% Hz.
- 4.2 The electronics should be well protected against any fluctuation in power supply or any spike.

5.0 ATMOSPHERIC CONDITIONS :

- 5.1 The ambient temperature at the site at which the machine will be installed may vary from 0 degree C to +50 degree C over the year. The relative humidity may be as high as 98%. The atmosphere is expected to be dusty. The machines offered shall be suitably tropicalised to work under these atmospheric conditions without any adverse affect on their performance.
- 5.2 The temperature rise shall not reach a value that there is a risk of injury to any insulating material or adjacent parts.

RAIL COACH FACTORY, KAPURTHALA

Specification No.	Description	Page No.	Date
Mech/M&P/3200/GM/06 Rev.- NIL	Portable Air Plasma Cutting Machine	13 of 12	20.12.2017

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