Before correction	After correction			
Clause no:1.1	An automated Immersion Ultrasonic System for the inspection of Cylindrical bars and			
An automated Immersion Ultrasonic System for the inspection of Cylindrical bars and hollow tubes	hollow tubes made of various metal alloys through pulse echo method.			
made of various metal alloys through pulse echo method.				
Diameter range : 8 mm – 300 mm				
Max. Length : 6000 mm				
Max. Weight : 3 Tonnes.				
Minimum wall thickness (for tubes): 2 mm	Bars:			
	Diameter range : 8 mm - 300 mm			
	Max. Length : 6000 mm			
	Min.Weight : 200gms			
	Max. Weight : 3 Tonnes.			
	Tubes:			
	Minimum wall thickness (for tubes): 2 mm			
	Diameter range : 8 mm - 60 mm			
	Max. Length : 1000 mm			
	Min.Weight : 200gms			
	Max. Weight : 1 Tonne.			
Clause No:2.	System Design:			
System Design:	The system must be immersion ultrasonic technique.			
The system must be immersion ultrasonic technique.	An immersion tank is to be provided together with a scanning gantry, ultrasonic			
An immersion tank is to be provided together with a scanning gantry, ultrasonic instrumentation,				
motion control, water system, operator station and software for part setup, motion, data collection	setup, motion, data collection and evaluation			
and evaluation	The sample will be run at a minimum speed of 20 RPM during inspection and shall have			
The sample will be run at a minimum speed of 20 RPS during inspection and shall have control on	control on rotational speed of sample along with provision of stop and analysis of			
rotational speed of sample along with provision of stop and analysis of defect/FBH/Notch.	defect/FBH/Notch.			
Clause No:3.2	Bar Rotator :			
Bar Rotator :	The han veteton shall consist of a set of drives and a set of drives with			
The har retator shall consist of a set of drives and a set of driven relleva with nelworther a section	•The bar rotator shall consist of a set of drives and a set of driven rollers with			
•The bar rotator shall consist of a set of drives and a set of driven rollers with polyurethane coating, the bar shall be able to rotate in any direction. Suitable VFD of Siemens/ABB make to be supplied.	polyurethane coating, the bar shall be able to rotate in any direction. Suitable Servo Drive /VFD of Siemens/ABB make to be supplied.			
•Mechanical design shall allow release area for loading and unloading parts to avoid shocks when	•Mechanical design shall allow release area for loading and unloading parts to avoid			
handling parts. Easy maintenance and accessories for routine maintenance shall be provided.	shocks when handling parts. Easy maintenance and accessories for routine maintenance			
nanum ₅ par 6. Dasy maintenance and accessories for routine maintenance shall be provided.	Shocks when handing parts, Lasy maintenance and accessories for routile maintenance			

	Axis	Mechanis	Speed Range	Stroke	Accuracy	Repeatability	Scan
		m	(mm/s)	(mm)		(mm)	resoluti
					/ 300 mm		on
							(mm)
1	X (Linear)	Rack & pinion	0.1 - 500	6000	0.025mm	≤0.02	0.01
2	Y (Linear)	Ball Screw	0.1 - 500	1000	0.025mm	≤0.02	0.01
3	Z (Linear)	Ball screw	0.1 - 150	500	0.025mm	≤0.02	0.01
4	W (Roller)	Bevel & Spur gears	0.1 - 100 RPM	NA	± 0.03 deg	± 0.03 deg	0.01de g

nall be provided.	

	Axis	Mecha	Speed	Stroke	Accuracy	Repeatab	Scan
		nism	Range	(mm)		ility (mm)	resolution
			(mm/s)		/ 300 mm		(mm)
1	X (Linear)	Rack & pinion	0.1 - 500	6000	± 0.025mm	≤0.02	± 0.0 5
2	Y (Linear)	Ball Screw	0.1 - 500	1000	± 0.025mm	≤0.02	± 0.0 5
3	Z (Linear)	Ball screw	0.1 - 150	500	± 0.025mm	≤0.02	± 0.0 5
4	W (Roller)	Bevel & Spur gears	0.1 - 100 RPM	NA	± 0.03 deg	± 0.03 deg	0.01deg

Clause No:6

Motion Control:

- The scanning axes to be driven using a Siemens / Schneider /Beckhoff servo motion control system and the support axes will be driven using a Siemens / Schneider /Beckhoff induction motor system.
- The electrical components shall be housed inside a suitable powder coated MS enclosure with proper exhaust provision.
- The enclosure shall have necessary switches, indicators and tower lamp as per industrial standards.
- A pendant to be provided to for free jogging all the axes (both induction and servo).
- External encoders to be provided on all linear and rotary axis.
- Positions of various axes with their feed rate, speed, increment and other details to be displayed on the display screen of controller and PC through encoders.
- Emergency stop button on controller, pendant and in field to be provided to stop the motion of manipulator.

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- Emergency stop button on controller, pendant and in field to be provided to stop the motion of manipulator.
- Electromagnetic limit switches & Mechanical shock absorbing bumpers at each end of travel for X,Y and Z axis.

Clause No:16

Eligibility criteria:

The supplier should have supplied

- Minimum 5 Nos. of Immersion testing UT machines of similar capacity and application(bar inspection) globally in the last 5 years(as on tender date) meeting the sensitivity of 0.8 FBH defects in bars of up to 300mm diameter(Steel & steel alloys, and Titanium & titanium alloys).
- Machine should have been supplied, installed & commissioned and in working condition as on tender date.
- Supplier shall provide brief description of the systems supplied previously, customer and salient features of the equipment along with specifications. The details of the above shall be furnished to assess the suitability of the supplier and their previous experience in supplying similar equipment's. If the supplier does not furnish the above details along with technical bids, no clarifications will be sought in this matter and their offer will be rejected. Midhani reserves the right to accept or reject the offers based on the experience of the party in supplying similar capacity machine and sensitivity levels mentioned in specifications.
- If the supplier has not supplied for testing of titanium products ,then, technical bid will reviewed be accepted based on satisfactory demonstration & certification by ASNT Level III(UT) qualified person. The demonstration & certification by ASNT level III shall be on Titanium (Ti6Al4V) reference blocks made in accordance to ASTM E 127 or 428 having 0.8mm FBH at 25mm,50mm,75mm,100mm,125mm,150mm,175mm,200mm,225mm,250mm,275mm & 300mm Metal Paths.
- It is suppler responsibility to arrange Titanium reference blocks at their own cost.
- The ASNT Level III person shall certify that he has witnessed the demonstration on proposed machine which meets all the specification requirements and the report shall provide complete details of results like SNR,C-scan,A results etc.
- Incomplete or insufficient information report will not be acceptable and no clarifications will be sought in this matter and their offer will be rejected.
- Midhani team will review the results and if found suitable, then only bid will be technically accepted.
- If the supplier provided results are not clear or requires more clarity, Midhani team may visit to verify the demonstration and reserve the right to reject the bid if not found suitable or satisfactory.
- The supplier should have after sales service/AMC support in India. The supplier must be in a position to attend the repair call within 48hrs. The supplier can be OEM or Authorized Representative in India.

The supplier should have supplied

- Minimum 5 Nos. of Immersion testing UT machines of **similar application** (bar inspection) globally in the last 5 years(as on tender date) meeting the sensitivity of 0.8 FBH defects in bars of up to 300mm diameter (Steel & steel alloys, and Titanium & titanium alloys).
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