

CLAUSE NO.	TECHNICAL REQUIREMENTS		
ASTM 898 -89	Standard guide for use of high solid content, cold liquid-applied elastomeric water proofing membrane for use with separate wearing course.		
AS/NZS 2728	Pre finished / pre painted sheet metal product for interior / exterior building applications – Performance requirements.		
AS : 1365	Standards for steel manufacturing.		
AS : 1397	A steel sheet & strip – hot – dipped-zinc-coated or Aluminium-Zinc coated.		
AS : 3566	Self drilling screws for building and construction industry.		
IRC : 37	Guidelines for the design of flexible pavements.		
-	Manual on sewerage and sewage treatment (Published by CPH & EEO) As updated.		
	Indian Explosives Act. 1940 as updated.		
	For “Foundation System and Geotechnical Data” refer “Project Information section” of Technical specification.		
	 		
LOT-1A PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-B 2924 BID DOCUMENT NO.: CS-0011-109(1A)-2	SUB-SECTION-IV-D CIVIL WORKS	PAGE 69 OF 69

Section VI: Part B V – Quality Assurance

NTPC Limited

(A Government of India Enterprise)



LOT 1A PROJECTS

**PART – B
(DETAILED TECHNICAL SPECIFICATION)**

**SUB-SECTION-V-Q
(QUALITY ASSURANCE)**

**SECTION – VI
TECHNICAL SPECIFICATION
FOR
FLUE GAS DESULPHURISATION (FGD)
SYSTEM PACKAGE**



BIDDING DOCUMENT NO. : CS-0011-109(1A)-2





PART – B (DETAILED TECHNICAL SPECIFICATION)
SUB-SECTION- V-Q (QUALITY ASSURANCE)



LOT-IA PROJECTS
FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE

TECHNICAL SPECIFICATION
SECTION-VI
BID DOCUMENT NO.: CS-0011-109(1A)-2



(MECHANICAL)



LOT-IA PROJECTS
FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE

TECHNICAL SPECIFICATION
SECTION-VI
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SUB-SECTION-V-QM1

FLUE GAS DESULPHURISATION SYSTEM



LOT-IA PROJECTS
FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE

TECHNICAL SPECIFICATION
SECTION-VI
BID DOCUMENT NO.: CS-0011-109(1A)-2

CLAUSE NO.	QUALITY ASSURANCE	एनटीपीसी NTPC
FLUE GAS DESULPHURISATION SYSTEM		
1.00.0	FLUE GAS DESULPHURISATION SYSTEM	
1.01.0	Mills:	
1.01.01	Raw material for shaft, coupling, gears and pinions, top and bottom races and other rotating components shall be subjected to UT. MPI/LPI shall be carried out to check surface soundness.	
1.01.02	Wear-resistant parts shall be UT/RT tested to check soundness after suitable heat treatment. Check for chemical composition, hardness and microstructure shall be carried out.	
1.01.03	Butt welds in the tube/separator/body casing of the mill shall be tested by RT and MPI. All other welds in main tube/separator shall be tested by MPI/LPI for acceptance. The tube shall be statically balanced.	
1.01.04	All gearboxes shall be run tested for adequate duration to check rise in oil temperature, noise level and vibration. Check for leak tightness of gear case also shall be performed.	
1.02.0	Feeders:	
1.02.01	Any welds in the casing/pulley fabrication shall be checked with MPI.	
1.02.02	Routine tests shall be done as per relevant Indian Standards or equivalent International Standards.	
1.02.03	All major items like plates for casing, head pulley, tail pulley, pulley shaft and major castings shall be procured with respective material test certificates.	
1.02.04	Calibration check shall be carried out on all feeders.	
1.03.0	Dampers:	
1.03.01	All the dampers shall be subjected to operational test/checks.	
1.03.02	Gas tight Dampers shall be subjected to shop leakage test to demonstrate the guaranteed tightness as per NTPC Tech Specification.	
1.04.0	PIPING, VALVE AND SPECIALITIES:	
1.04.01	All pipes and fittings shall be tested as per applicable code.	
1.04.02	All valves shall be hydraulically/Air tested for body, seat and back-seat (if applicable) as per relevant standard.	
1.04.03	NDT on valves shall be as per relevant standard.	
1.04.04	Valves shall be offered for hydro test in unpainted conditions.	
LOT-1A PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC NO.:CS-0011-109(1A)-2 SUB-SECTION – V-QM1 FGD System Page 1 of 4 Power Sector Marketing		

CLAUSE NO.	QUALITY ASSURANCE 
1.04.05	Functional checks of the valves for smooth opening and closing shall also be done.
1.05.00	TANKS / VESSELS:
1.05.01	Atmospheric tanks: i) All welds joints shall be DP tested and complete tanks shall be water fill tested. ii) All atmospheric storage tanks fabricated and erected at site shall be subjected to tests (Hydro, NDT and Vacuum) according to design code as applicable. iii) Rubber lining shall be tested for hardness and spark test, as applicable.
1.05.02	Pressure vessels: 1) NDT on weld joint shall be as per respective code requirements or the minimum as specified as below: i) 100% DPT on root run of butt weld, nozzle welds and finished fillet welds. ii) 10% DPT on all finished butt welds. iii) 10% RT (covering all 'T'/cross joints) of butt welds. 2) Butt welds of dished ends shall be stress relieved and subjected to 100% RT. 3) Each finished vessels shall be hydraulically tested to 150% of the design pressure for a duration of 30 minutes.
1.06.0	HEAT EXCHANGER/HEATER:
1.06.01	All material shall be tested for chemical and mechanical properties and NDT as per relevant standard.
1.06.02	NDT on welds and other checks shall be as per relevant code.
1.06.03	Air heaters shall be subjected to dimensional and clearance checks as per standard practice
1.06.04	Lub. oil system, drive system, soot blowing system etc. of Air heaters shall be checked suitably as per standard practice
1.07.0	PUMPS:
1.07.01	UT on shaft forgings (greater or equal to 40mm) and MPI/DPT shall be done on shafts and impeller to ensure freedom from defects.
1.07.02	The pump casing shall be hydraulically tested at 200% of pump rated head or at 150% of shut off head, whichever is higher. The test pressure shall be maintained for at least half an hour.
LOT-1A PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC NO.:CS-0011-109(1A)-2  

CLAUSE NO.	QUALITY ASSURANCE	
1.07.03	The pump rotating parts shall be subjected to static and dynamic balancing.	
1.07.04	All pumps shall be tested at shop for capacity, head efficiency and brake horse power at rated speed as per relevant/applicable standard.	
1.07.05	Noise and vibration shall be measured during the performance testing at shop.	
1.08.0	STRUCTURES , DUCTS, HOPPERS:	
1.08.01	All materials shall be tested for chemical and mechanical properties as per relevant standard. All plates above 40mm shall be 100% Ultrasonically tested.	
1.08.02	Visual inspection of all welds shall be performed in accordance with AWS D1.1.	
1.08.03	NDT requirements of structural steel welds shall be as under: i) 100% RT/UT on butt-welds of plate thickness ≥ 32mm. ii) For plates of $25\text{mm} \leq \text{thickness} < 32\text{mm}$ - 10% RT and 100% MPI. iii) For plates of thickness $< 25\text{mm}$ - 10% MPI/LPI.	
1.08.04	Edge for shop and field weld shall be examined by MPI for plate thickness ≥ 32 mm.	
1.09.0	VACUUM BELT FILTER SYSTEM:	
1.09.01	Impeller, casing and shaft of vacuum pumps shall be tested for chemical and mechanical properties as per relevant standard. All plates above 40mm shall be 100% Ultrasonically tested.	
1.09.02	UT on shaft (if greater or equal to 40mm) and impeller shall be carried out.	
1.09.03	All vacuum pumps shall be tested at shop for capacity, power, pressure, efficiency, noise and vibration etc.	
1.09.04	Filter cloths and belts shall be tested for physical properties as per relevant standard	
1.09.05	Hydro cyclones shall be checked by visual, dimensional etc.	
1.10.0	SPRAY NOZZLES:	
1.10.01	Spray nozzles shall be tested for physical properties	
1.10.02	Spray nozzles also shall be subjected to performance test.	
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CLAUSE NO.	QUALITY ASSURANCE	
1.11.0	AGITATORS:	
1.11.01	Rubber lining shall be tested for hardness and spark test	
1.11.02	Impellers shall be tested for dimensional and balancing check	
1.11.03	Gear Boxes shall be tested for run test as per standard practice	
1.12.0	FANS:	
1.12.01	Rotor components shall be subjected to ultrasonic test at mill and magnetic particle inspection / liquid penetrant examination after rough machining.	
1.12.02	Butt welds in rotor components shall be subjected to 100% RT and all welds shall be magnetic particle/dye penetrant tested after stress relieving.	
1.12.03	All rotating components and assemblies of fan shall be balanced dynamically	
1.12.04	Performance test shall be carried out on fans as per Technical specification/ Relevant standard	
1.12.05	Test for Natural Frequency and hardness of Fans blades shall be carried out as per Technical specification/ Relevant standard	
1.13.0	Thermal Insulation, Lagging & Cladding:	
	(a) Lightly resin bonded mineral wool:	
	LRB mattresses/sections of Rockwool/ Glasswool shall conform to & tested as per relevant clauses of Indian Standards and shall meet the requirements of NTPC data sheet. Type tests except Thermal Conductivity shall be regularly carried out once in three months, Thermal Conductivity Type Test shall be carried out minimum once in twelve months by the manufacturer. Requirements of various components like Binding wires, Lacing wires, Wire mesh, etc. shall be as per NTPC approved data sheet / as given in respective Sub-Section of Technical Requirements of Steam Generator & Auxiliaries.	
	(b) Lagging & Cladding:	
	All insulation shall be protected by means of an outer covering of Aluminium sheeting confirming to ASTM B-209-1060 temper H14 from reputed manufacturer meeting the requirements of NTPC data sheet.	
1.14.0	OTHER CRITICAL EQUIPMENTS:	
1.14.01	Checks/ NDTs shall be done as per relevant Indian Standards or equivalent International Standards.	
		
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC NO.:CS-0011-109(1A)-2	SUB-SECTION – V-QM1 FGD System Page 4 of 4