



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076.**

Ref. PR No. 1000053972

Rfx. No. 6100002910

Item Description: Ingress Protection Dust Chamber

Sr. No	Item Description	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Dust Chamber (Qty-1 Nos)	<p>A. Capacity - Machine Internal dimensions (W X D X H): (1000 X 1000 X 1000) mm: 1000 L We need to adjust machine in following dimensions Lift Door Dimensions: (W X H): (1676 X 2184) mm approximate Lift Internal Dimensions: (W X D X H): (1829 X 2400 2184) mm approximate Weight of chamber: (2400) Kg max</p>		
		<p>B. Test standard - IEC-60529</p> <p>Free-flow dust circulation centrifugal blower Dust pre-heating mechanism for free flow of the dust Two-stage vacuum pump to simulate negative pressure for IP6X test Volumetric air-flow meter/counter for IP6X test Uniform floating dust simulation across the test space Hopper re-vibration for free fall of settled dust</p> <p>Blower speed regulation to ensure metered uniform dust floating inside the test space View window with wiper & 65mm dia port hole on right of the chamber Color touch HMI with PLC</p>		
		<p>C. Construction:</p>		

		<p>Exterior material shall be made of min 2mm thick CRCS with powder coated panels/door with impressive precision & aesthetics</p> <ul style="list-style-type: none"> I. Interiors (unobstructed) with brush finish 18swg high quality stainless steel II. Inner test space bottom will have hopper design to circulate the dust uniformly 		
		<p>D. Dust replacement port shall be provided</p> <ul style="list-style-type: none"> I. The default chamber will have one no of adjustable rod-type SS shelve/s for loading the specimen in the test-space. 		
		<p>E. Vacuum Pump:</p> <p>Two-stage ultra-low vacuum pump shall be used</p> <ul style="list-style-type: none"> I. Vacuum flow-meter with regulation system for controlling the vacuum rate. II. Flexible hose with vacuum port provision inside the test chamber to connect to test specimen. III. Vacuum extraction rate will be regulated between 40-60 volumes / hour. 		
		<p>F. Dust Circulation System:</p> <ul style="list-style-type: none"> I. High-section velocity centrifugal blower for uniform dust circulation. II. Flange-mounted-direct-coupled motor will be integrated to the blower with air-tight sealing's. III. Closed-loop dust circulation. IV. 50 x 75 Micro meter square mesh sieve as per IEC 60529 		
		<p>G. Instrumentation & Control:</p> <p>Colour Touch Screen Controller is built around high-performance core hardware with integrated functionality. IP 66 protected enclosure for front screen with many added features viz., USB host port, on board 4 GB Flash,512MB RAM with real time clock. Touch screen controller allows the user to easily view and access information through the 7" Resistive Analog touch screen and through a web server using a PC.</p>		

		Et touch controller programmed with 20 programs, in each program with 20 segments. users can configure their test profiles as per their requirements.		
		<p>H. FEATURES:</p> <ul style="list-style-type: none"> I. 7-inch TFT colour display, led backlight. II. 800 X 480 Pixel (WVGA) Resolution,64K Colours. III. Resistive touch screen. IV. Ethernet port, USB port. V. Multi language support. VI. Multi-level security. VII. Remote monitoring control with VNC web server. 		
		<p>I. SAFETY AND CONTROL:</p> <ul style="list-style-type: none"> I. MPCB/MCB for all the individual 3-phase and 1-phase power devices II. Single phase, phase reversal, under voltage and over voltage protection for main input power III. EMI protection for control circuit IV. POWER REQUIREMENT: 3 PHASE, 415VAC +/- 10%, 50 Hz, Earth V. TOTAL CONNECTED LOAD: Approx. 4000 watts 		
		J. Additional reinforced tray is considered to withstand the load bearing capacity of 50KG UDL.		
		K. NABL calibration certificate, Pre-dispatch inspection, warranty, production qualification reports, chamber drawing & installation requirements, spares to be needed		
2.	Rain Chamber: (Qty-1 Nos)	A. The chamber level Rain Test Chamber built to simulated IP tests with single sheet stainless steel 304 material.		
		B. Test standards - IPX1,X2,X3,X4,X5,X6,X6K		
		<p>C. High quality corrosive resistance material for construction.</p> <p>D. Highly reliable water circulation pump and pipeline.</p>		
		E. Spray nozzles are manufactured in single operation CNC with high dimensional accuracies.		

		<p>F. Vibration-free rotating table with variable speed control</p> <p>G. View glass door with wiper</p>		
		H. Friction Free water-tight door-locking mechanism.		
		I. Automated Control Panel Desk.		
		J. Heavy duty Aluminium hinges for easy swing-over of the door.		
		K. 7" TFT colour display		
		L. Automated Console		
		M. Programmer Control HMI for Easy access		
		N. Chamber Internal dimensions - (W X D X H): (1200 X 1200 X 1200) mm approximate		
		<p>O. Lift dimensions - We need to adjust machine in following dimensions</p> <p>P. Lift Door Dimensions: (W X H): (1676 X 2184) mm approximate</p> <p>Q. Lift Internal Dimensions: (W X D X H): (1829 X 2400 2184) mm approximate</p>		
		<p>R. CONSTRUCTION FEATURES:</p> <p>I. Mono-block construction with high corrosive resistive materials</p> <p>II. Chamber interior & exterior material will be single sheet SS 304</p> <p>III. Base structure will be high-gauge SS square tube</p> <p>IV. All the joints and corners finished with high-quality tig-welding and buffing</p> <p>V. Friction Free water-tight door-locking mechanism</p> <p>VI. Easily accessible control desk</p>		
		<p>S. IPX1 & X2 (Drip test):</p> <p>Modular design drip tank will be mounted on top of the test chamber</p> <p>Drip area will be 800 x 800 mm</p> <p>I. Easy access on the top for maintenance and cleaning.</p> <p>II. In-built water level control switch for controlling the fall-out rate.</p> <p>III. Drip tank constructed with high-gauge SS 304 material with removable nozzles.</p>		

		<p>T. Water collection jar (IPX1 & X2):</p> <p>Water collection Jar is made up of FRP material</p> <ol style="list-style-type: none"> I. Beaker will be provided for water collection II. Glass beaker max scale will be 20mm III. Collecting are will be 100cm² IV. Water collection will be measured as per IEC60529 for IPX1 & IPX2 		
		<p>U. IPX3 & X4: (Oscillating tube test):</p> <p>Oscillating tube is mounted in the test chamber. Diameter of the tube will be 800mm</p> <ol style="list-style-type: none"> I. Distance between the nozzles will be 50mm on 0.4mm dia. II. Oscillating tube is coupled with gear motor and rotary joint. III. Oscillating tube will have fixed angle limit for rotation. IV. Flow rate and pressure will be controlled manually. 		
		<p>V. IPX5, X6, X6K (Water jet test):</p> <ol style="list-style-type: none"> I. Water jets are made out of SS 304 material. II. Water jet nozzles in-lined with pressure gauge and flow-meters for monitoring flow and pressure. III. Water jets are connected with 5-meter length flexible pipe with adjustable stand-alone tripod stand. IV. Stand and water jets can be dismantled when not in use. V. For IPX5/IP6K 6.3mm diameter nozzle and for IPX6 12.5mm diameter nozzle will be used. 		
		<p>W. Turn Table:</p> <ol style="list-style-type: none"> I. Vibration-free rotating/turn table with variable speed control system. II. Stainless steel 300mm diameter turn table will be used with load bearing capacity of 40Kg. III. A manual height adjustment mechanism will be provided for adjusting the table height of max 500 mm. 		

		IV. Stainless steel joint-free feed-thro shaft coupled between gear motor and turn table		
		<p>X. Water Circulation Pump:</p> <ul style="list-style-type: none"> I. Independent Centrifugal mono-block pump will be used to circulate water for IPX1-4 system. II. Independent mono-block pump will be used for circulating the water for IPX5-IPX6 system. III. Independent multistage vertical pump will be used for optional IPX6K test. IV. CPVC pipelining with inline water filter and regulating valves for regular system. V. Analog flow meter with ON/OFF control for IPX1 and X2 will be provided 		
		<p>Y. Instrumentation & Control:</p> <p>Colour Touch Screen Controller is built around high-performance core hardware with integrated functionality.</p> <p>IP 66 protected enclosure for front screen with many added features viz., USB host port, on board 4 GB Flash,512MB RAM with real time clock.</p> <p>Touch screen controller allows the user to easily view and access information through the 7” Resistive</p> <p>Analog touch screen and through a web server using a PC.</p> <p>Et touch controller programmed with 20 programs, in each program with 20 segments. users can configure their test profiles as per their requirements.</p> <ul style="list-style-type: none"> I. 800 X 480 Pixel (WVGA) Resolution,64K Colours. II. Resistive touch screen. III. Ethernet port, USB port. IV. Multi language support. V. Multi-level security. VI. Remote monitoring control with VNC web server 		
		Z. Safety & Control:		

		<p>MPCB/MCB for all the individual 3-phase and 1-phase power devices.</p> <ol style="list-style-type: none"> I. Single phase, phase reversal, under-voltage and over-voltage protection for main input power. II. EMI protection for control circuit. III. Water level float will be provided for the water reservoir tank. IV. Automatic water make-up valve will be provided. 		
		AA. Power requirement: 415VAC +/- 5%, 3 Phase 50/60 Hz, 4 wire + E		
		BB. Space around the chamber: 600- 1000 mm on three sides except front		
		CC. Drain connection: The drain point near the chamber		
		DD. DM Water: Continuous Demineralized Water required to the chamber inlet provision		
		EE. Turn table: 50Kg load bearing capacity		
		FF. NABL calibration certificate, Pre-dispatch inspection, warranty, production qualification reports, chamber drawing & installation requirements, required spares.		
3.	General Terms and Conditions:	<ol style="list-style-type: none"> I. The Machine must have a properly sealed door structure to prevent water leakage from inside while allowing the operator to stand outside and monitor the machine operating condition. 		
		<ol style="list-style-type: none"> II. Warranty: A comprehensive warranty shall be provided for a period of one (1) year from the date of successful installation and commissioning. 		
		<ol style="list-style-type: none"> III. Installation: The supplier shall be responsible for the complete installation and commissioning of the system within one week from the delivery of the materials. 		
		<ol style="list-style-type: none"> IV. Payment Terms: 100% payment shall be released upon delivery ICICI Foundation on behalf of IIT Bombay. 		