

SPECIFICATIONS “Design, Fabrication, Supply, Installation & Commissioning of Automatic Conveyorised Integrated Powder Coating Plant along with Pre-dip treatment Plant (On Turn Key Basis)”

Code No. _____

Qty. – As mentioned

Description:		
Automatic powder coating Plant with a feature of quick change of powder coating colors on various tubular frames & Sheet metal components. (refer attached drawings)		
The System is automated from loading of frame on conveyor to final coating to unloading of frame. (Refer attached schematic diagram)		
Offline degreasing system.		
Overhead close-loop conveyor Plant used for movement of material across stations of powder coating line.		
A	Scope of supply/work	
1	Degrease & De-Rust system (Offline) for Rusted Component only	Confirm
2	Fully automatic powder coating plant with over head Conveyorised dip pretreatment consisting:	Confirm
2.1	Dip Pre-treatment Plant with Water Drying Oven (In line to Conveyor)	Confirm
2.2	Powder Coating Booth with Guns (Automatic along with Provision of touch up guns)	Confirm
2.3	Powder Curing Oven	Confirm
2.4	Continuous Over Head Conveyor	Confirm
3	PNG piping with all accessories	Confirm
4	Electrical Panel & Cabling	Confirm
5	Installation and successful commissioning with trials	Confirm
B	Technical Specification	
Sr. No.	Description of requirement	Required
i	Basics of Design	
1	Product size maximum (mm)	900L x 900W x 1500H
2	Product Cutout Envelope Enclosure(mm)	1100L x 1100W x 1700H
3	Material of component to be Powder coated	MS/AL (Mild Steel tubular/Sheet, Aluminum tubular/Sheet as per drawing)
4	Weight of Product (Largest)	30 kg
5	Working Shift	2
6	Working Hours/Shift	8 hrs/Shift
7	Productivity: No. of Products/year (in no.)	360000
8	Productivity: No. of Products /Month (in no.)	30000
9	Productivity: No. of Products /shift	600/shift of 8 hours
10	Powder baking schedule	EMT 10-12 minute @ 180°C
II	Offline Degreasing & De-Rusting System (manual with hoist dipping arrangement)- offline	
	Process	6 Tank cleaning process Working Dimension
1	Tank material as follows:	
1.1	Degreasing Tank	M.S. (Minimum 4 mm Thick)

		Size: (2350L x 1300W x 2450H) mm
1.2	Water Rinse-1 Tank	M.S. (Minimum 4 mm Thick) Size: (2350L x 1300W x 2450H) mm
1.3	De-Rusting Tank	SS 316 (Minimum 2.5 mm Thick) Size: (2350L x 1300W x 2450H) mm
1.4	Water Rinse 2 Tank	MS 4mm Thick with inside FRP Minimum 4 mm Thick Size: (2350L x 1300W x 2450H) mm
1.5	Water Rinse 3 Tank	MS with inside FRP coating (Minimum 4 mm Thick) Size: (2350L x 1300W x 2450H) mm
1.6	Rust Prevention Oil Tank	MS (Minimum 4 mm Thick) Size: (2350L x 1300W x 2450H) mm
III	Tank Heating System	For Degrease
1	Fuel	PNG
2	Initial Heating Time	60 minute (maximum)
3	Temperature	De-Grease: 55°C (maximum)
IV	Accessories for Dip Pre-treatment offline Plant	
1	Fume Extractor- for De-Grease (01 Set) minimum capacity	2500m ³ /hr , 3 Phase 415 V A.C.
2	Scrubber for De-Rusting	Confirm
3	Electrically Operated Hoist shall be capable of material movement in all tanks of offline De-greasing & De-rusting system.	01No. capacity - 1000 kg
4	Basket: Basket is used to transport material from one tank to another The same basket will keep small as well as large component of each product as per attached product drawings	Confirm
4.1	Material of Basket	Stainless Steel
4.2	No. Of Basket	Minimum 6 No.
4.3	Basket Size (Minimum)	(2150L x 1000Wx 1950H) mm
4.4	Weight Of Basket (Empty)	Minimum (120-140) Kg
4.5	Weight Of Basket (With Component)	Minimum 250 Kg
5	Air agitator for De-Rusting System: Agitator is consisting of 02 set of blowers connected parallel which is comprised of suction with filters & distribution ducting/piping through all pre-treatment tanks. (One blower will work at a time).	Twin-lobe Blower motor Capacity: (3 H.P.,200 m ³ /hr) (Minimum) each
V	Pre-treatment Process (automatic with conveyors dipping arrangement)- Inline	
1	Process	6 Tanks cleaning process Working Dimension

	Tank Material as follows:	
1.1	KOD (Knock Off Degreasing) Tank	MS- 4 mm (Minimum) Size: (15345L x 1400W x 1925H) mm
1.2	Degrease Tank	MS- 4 mm (Minimum) Size: (Size: 15345L x 1400W x 1925H) mm
1.3	Water Rinse 1 Tank	MS- 4 mm (Minimum) Size: (12845L x 1400W x 1925H) mm
1.4	Water Rinse 2 Tank	MS- 4 mm (Minimum) Size: (12845L x 1400W x 1925H) mm
1.5	DM Rinse 1 Tank	SS 304 (Minimum 2.5 mm Thick) Size: (12845L x 1400W x 1925H) mm
1.6	NANO Coating Tank	SS 304 (Minimum 2.5 mm Thick) Size: (15345L x 1400W x 1925H) mm
7	DM Rinse 2 Tank	SS 304 (Minimum 4 mm Thick) Size: (12845L x 1400W x 1925H) mm
8	Air Blow Zone	After DM Rinse 2
8.1	Description	To blow off extra water from component it is provided after all tanks with suitable capacity blower.
8.2	Air Blow off Zone blower capacity (minimum)	3 H.P. 1400 rpm, 6000 m ³ /hr
8.3	Each Article travel time	0.5-1 Minute @ 2.5 meter/ min conveyor speed.
9	The tanks should have water inlets, overflow connection and drain connections with valves and pipes along with pipes/ducts to blow air to all tanks of appropriate quality and length.	Confirm
9.1	Tank Valve Size	
1	Inlet Water (in mm)	50 NB (minimum)
2	Drain Water (in mm)	100 NB (minimum)
VI	Tank Heating System	For KOD, Degrease & cleaning from side of tank
1	Fuel arrangement	PNG with suitable burner
2	Initial Heating Time	60 Minute.
3	Temperature	55°C max.
VII	Accessories for Pretreatment- Inline	
1	Air agitator: Agitator is consisting of blower which is comprised of suction box with filters & distribution ducting/piping through all pre-treatment tanks.	02 nos. Required Twin lobe Blower motor Capacity: 30 H.P., 2100 m ³ /hr (Minimum)
2	Nano Filter	Confirm

	Suitable 0.5 Micron Filter with SS housing & easy to clean/remove.	
3	Oil skimmer Belt Type with Motor Separate Tank & Pump for circulation with main process tank of De-grease.	Required Capacity of Motor: 90 W, 30 rpm (minimum)
4	DM Plant	
4.1	Capacity (minimum)	2000 L per hour
4.2	DM Conductivity (minimum)	10 µSiemens
4.3	PH value	6.5-7
4.4	DM Make	Amit Aqua/Ion Exchange/Span Hydrotech/Hi-Tech
VIII	Water Drying Oven (WDO)	Conveyorised (Automatic)
1	Fuel	PNG
2	Max. Temp.	140 °C
3	Initial Heating Time of oven	60 Minute (maximum)
4	Material of construction of Oven	CRCA and HR
5	Insulation	Rock Wool Density 48 Kg/M ³ (Minimum)
6	WDO Heating System room Temperature	0-2°C (minimum)
7	Oven Over-All Dimension	(14715L x3130W x 5825H) mm (minimum)
8	Oven Working Dimension	(12615L x3030W x 2800H) mm (minimum)
9	Article Entry & Exit Gate/Cut-out Size	1100 mm(W) x 1700 mm (H) (minimum)
10	Article entry and exit	Conveyorised
11	Finish Painting	Inside Heat Resistant Aluminium paint, Outside enamel paint
12	Safety	
12.1	Pressure control	Confirm
12.2	Safety door: Which have Proper Provision to escape gases in case of emergency with Pre-Define temperature and Pressure.	Confirm
12.3	Inspection cum explosion door	Confirm
13	Indication Lamps & Push Buttons	Confirm
14	Temperature Indicator and Controller for Oven Temperature PT100 (Thermo-couple type) Sensors for Temperature	Confirm
15	Temperature Indicator Cum Controller (TIC)	02 no. (minimum)
16	PT 100 Sensor	01 no. (minimum)
17	Vent for Oven (natural Exhaust for flue gas)	Confirm
18	Moist Filter for burner in inlet manifold	Confirm
19	Blower burner Interlock	Confirm
20	Oven working	Auto cycle
IX	Pressurization zone	
1	Description	To provide dust free atmosphere while powder coating, this chamber is provided in which filtered air

		is delivered at top of booth through duct at specific air velocity.
2	Blower Pressure	60-65 mm WG
3	Illumination in Zone	400 to 600 lux
4	Material	Folded Panels fabricated out of 16 SWG / 2 mm CRCA with View Glass
5	Air handling unit	Blower and suitable filters which will positively deliver the air inside the zone.
X	Powder Curing Oven (PCO)	
1	Fuel	PNG
2	Max. Temp.	220.00 °C. at EMT
3	Initial Heating Time of oven	Maximum 60 minutes
4	Material of construction	CRCA and HR
5	Insulation to be designed in such a manner that Outside surface temperature will be at room temperature	Rock Wool Density Approx. 48 Kg/M ³ . (Minimum)
6	PCO Heating System room Temperature	0-2°C (minimum)
7	Finish Paint for Oven	Inside Heat Resistant Aluminum paint, Outside Enamel paint
8	Entry & Exit Gate Size	1100 mm(W) x 1700 mm (H) (minimum)
9	Article Entry & Exit	On Conveyor along Camelback type to Prevent Heat Loss
10	Oven Working Dimension	(15285L x6230W x 2700H) mm (Minimum)
11	Oven Overall Dimension	(15685L x6630W x 5825H) mm (Minimum)
12	Safety	
12.1	Pressure control	Confirm
12.2	Safety door: Which have Proper Provision to escape gases in case of emergency with Pre-Define temperature and Pressure.	Confirm
12.3	Inspection cum explosion door	Confirm
13	Indication Lamps & Push Buttons	Confirm
14	Temperature Indicator Cum Controller for Oven Temperature PT100 (Thermo-couple type)Sensors for Temperature	Confirm
15	Temperature cum indicator controller (TIC)	02 no. (minimum)
16	PT 100 Sensor	01 no. (minimum)
17	Vent for Oven (natural Exhaust for flue gas)	Confirm
18	Moist Filter for burner in inlet manifold	Confirm
19	Blower burner Interlock	Confirm
20	Oven working	Auto cycle
XI	Conveyor (All across the process)	
1	Type	4-wheel open track
2	Conveyor speed	2.5 meter/minute
3	Conveyor length	Minimum 475 meter

4	Drive	Sprocket/caterpillar type
5	Take up	Screw/dead weight type
6	Point load	40 Kg maximum
XII	Powder coating booth	
1	Description	Automatic booth consisting of reciprocator, auto guns, cyclone recovery system, post filter unit with pulsing and provision of two manual touch up stations with manual gun.
1.1	No. of auto guns	Minimum 10 on booth (5 on each side) or better
1.2	Construction of booth	SS-316 panels and MS structure. (With illumination of min. 400 Lux)
1.3	Vendor to give total colour change time	90 minute (Maximum)
1.4	Powder Recovery System	Confirm
1.5	Height sensor (working: no object no spray)	Confirm
XIII	SCADA (Supervisory Control and Data Acquisition) Based Centralized Control system (The panel body should be Powder Coated) for Indication, Control & Monitoring for all heating tank temperature, pH Value, Level Indicator for solution of all tanks, Water drying Oven temperature, baking oven temperature, working of all powder coating gun, Conveyor system.	Confirm
1	PC Based controlling the complete system along with Conveyor	Confirm
2	Other than offline Pre-dip treatment plant, Centralized PC Base Control System should provide single point control to operate all plant activities such as conveyor, ovens, all type of sensors, alarms, blowers.	Confirm
3	PC Configuration	Confirm
3.1	High configuration system (i7 Processor or higher)	Confirm
3.2	RAM	4 GB (minimum)
3.3	Windows 10 Professional Operating System (Except Windows Home)	Confirm
3.4	Monitor with suitable HDMI Cables & repeater size as mentioned	02 Set
3.5	Monitor Size	
3.5.1	19" LED (01 Set)	Confirm
3.5.2	90" LED (01 Set)	Confirm
4	Serial Ports/Serial PCIX Cards	02 Set
5	Wired Ethernet Port	Confirm
6	Wi-Fi USB	Confirm
7	Bluetooth USB	Confirm
C	Component Hanging Fixtures	
	Vendor to design manufacture & supply fixture for Pre-dip & Powder coating & Curing for the products Kit as per drawing (refer drawing Attached)	As mention below Vendor to specify & Confirm

1	Tricycle Family (Small Part Fixture other than main frame) (TD2C98, TD2C95/96, TD2C79, TD2C38/28 & TD2A65,TD2C48) (Vendor to design single fixture to accommodate all type of Product & its components as mention).	200 Nos
2	Wheel Chair Family	
2.1	TD2C51, TD2A06, TD2A26, TD2A02 & TD2B37 (Vendor to design single fixture to accommodate all type of Product & its components as mention).	150 Nos
2.2	Wheel Chair Rough Terrain (TD2C36)	50 nos
3	Tripod, Tetra Pod & Can etc. Drawing No. : TD 2P 02, TD 2P 04, TD2N82, TD2N85, TD2N86, TD1N70 (Vendor to design single fixture to accommodate all type of Product and its components as mention).	60 nos
4	Rollator(Size-I & Size-II), Walker, Drawing No.: TD2N85, TD2N86, TD2N82. (Vendor to design single fixture to accommodate all type of Product and its components as mention).	40 nos
5	Vendor to ensure the fixtures are pre-coated to avoid deposition during coating	Confirm
6	The Fixture should be made in such a manner that all components of single product may set up in single fixture Vendor to refer attached product drawing for same.	Confirm
7	Vendor to refer attached fixture drawing for reference and make its own drawing considering the envelope and over-all requirement for all family of product.	Vendor to give fixtures manufacturing drawing for all product & Confirm
D	Inline Stripping Off Arrangement After powder coating hanging Jigs & fixture will dip into this tank to remove powder particles deposited on hanging Jigs & fixtures.	Qty- 2 nos., MS- 4 mm (Minimum) (Vendor to confirm & Provide Details)
1	Cleaning Tank	Size: (15345L x 1000W x 1925H) mm , MS- 4 mm (Minimum)
2	Water Rinse	Size: (15345L x 1000W x 1925H) mm, MS- 4 mm (Minimum)
3	Tank Heating System	For Fixture cleaning tank from side of tank
3.1	Fuel arrangement	PNG with suitable burner
3.2	Initial Heating Time	100-120 Minutes.
3.3	Temperature	80°C maximum
E	Make Sheet	
1	Burner	Ecoflam / Riello/FBR Burners/ELCO
2	Twin-Lobe Blower	Nadi / Everest

3	Motor	Crompton Greaves/ ABB /Bharat-Bijlee/ Siemens
4	Powder coating booth with Powder Coating Gun	GEMA / Wagner / Ven Tec
5	LED Display	Panasonic/LG/Samsung
6	Main Switch, MCB, Contactor, Over Load Relay, PLC	Siemens/ C&S/L&T
7	Sensors	Honeywell/Sparkfun/Sushant Enterprise
8	Cable	Finolex/Havells/RR
F	General	
1	Other than mentioned any other Required Accessories for Plant (Vendor to provide list)	Specify & Confirm
2	Cabling (All necessary cables of right size is in Vendor Scope)	From Bus Bar to all Equipment
3	Exhaust Duct	Insulated till 2 metre from ground
4	Water Inlet/outlet Piping (All necessary pipes of right size is in Vendor Scope)	At one point near to pre-treatment, further piping will be in supplier scope
5	PNG Gas Consumption per hour (Piping from gas bank to system is in Vendor scope). (Vendor to note that given consumption is indicative one, Vendor to calculate load as per his design and submit while filling bid.)	120 Kg/Hr (Approx)
G	Qualification Criteria	
1	In house Installation/Commissioning Team with suitable staff	Confirm & Provide Details
2	Prior Experience of supplying such systems to manufacturers of M.S. Pipe/ Tubular Structure components. Vendor must have done such installation at least 05 nos. such plants during last 05 years Vendor to provide details of such customer along with contact number.	Confirm & Provide Details
H	<u>Documentation-</u>	
1	Detailed layout plan and prospect to be given (Area of shop as per attached drawing)	Each documentation three sets in English along with delivery
2	Operating instruction& Manual	
3	Installation and Commissioning instructions	
4	Time Temperature Record Report	
5	Preventive maintenance instructions	
6	Instruction manual for supplied coolant concentrate and coolant	
7	Detailed invoice and packing list of all items and devices and detailed prospect of machine and all other accessories enclosed in.	
8	List of proposed powder & other consumable required to run the plant	
9	The consumables for Initial fill, prove out are in vendor scope. Other than the consumables for initial fill the following consumables need to be supplied.	
9.1	Chemical for KOD & De-greasing 6Tons along with plant (Vendor to give At-Least 3 make with similar chemical properties)	

9.2	Chemical for De-Rusting 4.5 Tons along with plant (other than chemical require for prove out) Vendor to give At-Least 3 make with similar chemical properties)	
9.3	Chemical for NANO coating – 3Ton (Vendor to give At-Least 3 make with similar chemical properties)	
9.4	Powder for Powder Coating Plant 9 Ton along with plant (Vendor to give At-Least 3 make with similar chemical properties)	
9.5	Chemical for Strip-off System-4.5 Ton (Vendor to give At-Least 3 make with similar chemical properties)	
10	List of necessary spares required to run the plant (Only list is required, Rate not to be quoted in TC-Bid)	
I	<u>Installation & commissioning-</u>	
1	The complete installation and commissioning must be carried out by the supplier at the project site (ALIMCO-Kanpur)	Confirm
2	Training to be provided during installation, commissioning and prove out at ALIMCO-Kanpur.	Confirm
2.1	Operator training	28 Days
2.2	Maintenance course all Inclusive (mechanical, electrical and electronics)	15 Days
2.3	6 month hand holding (Vendor to consider 3 days visit per month till 6 month, All expenses will be borne by Vendor)	Confirm
3	Prove Out powder coating of 5 Days planned production of components to be done at ALIMCO Premises. (Refer Attached Product Drawings).	Confirm
J	<u>General operating condition</u>	
1	3 Phase 415V +/- 10%	Confirm
2	Frequency 50 Hz +/- 5%	Confirm
3	Protection level	IP54 or better
4	System should have capability to handle voltage, current and frequency fluctuation, necessary protection to be provided.	Confirm
5	Complete electrical system should be tropicalized for Indian condition 5 to 50 degree centigrade temp and RH 100% (Including additional accessories)	Confirm
K	<u>Service</u>	
1	Detail of authorized Service Partners in India (Name & Address) must be certified by manufacturer and shown in the quotation	Confirm
L	<u>Warranty:</u>	2 years (Minimum)
M	Vendor shall consider any other item, (other than mention in Annexure-A) necessary for successful operation & installation of plant, Vendor shall provide list.	Confirm

DELIVERY PERIOD INCLUDING INSTALLATION & COMMISSIONING:

The delivery, installation & commissioning period of complete Powder Coating Plant at the destination mentioned in Para 1 on page no. 02 of the tender documents will be 10 months for delivery and installation, commissioning & Prove-Out from the date of placement of Purchase Order/work contract.

WARRANTY:

The entire Powder Coating Plant inclusive of all system/accessories must be covered under warranty for a period of 24 months (minimum) from the date of successful Installation & commissioning.

NOTE:

1. Breakdown calls to be attended within 48 hrs.
2. Supply to be done on Turnkey Basis. ALIMCO shall provide electrical supply point, air supply and water supply near to the place of installation. (Civil Layout will be provided)
3. Civil foundation details and drawings with specifications to be provided by the tenderer.
4. Total power Electrical power consumption (in KW) & Gas Power Consumption (in Kg/hr) to be provided by the tenderer.
5. Layout drawing should be provided in CAD format.
6. Visual control board to be provided for monitoring with alarm signals.
7. ALIMCO may at its discretion decide to visit & verify the facility and validate in case of discrepancy the vendor shall be technically disqualified.
8. All necessary Details as asked in Annexure-A to be duly full-filled failing which Bid shall be technically Rejected.
9. The Drawing/Layout attached along with details is for standard purpose and should be the minimum qualifying criteria in all aspect. However vendor is free to design its own plan & supply above standard inculcating minimum requirement of the plant and if any change should be submitted while filling bid.
10. Entire System shall be designed and commissioned for ease of access of all facilities and maintenance.
11. The Bus bar trunking (BBT) for electricity has been provided at 8.5 meter height. Sufficient suitable cable, cable tray, circuit breaker, fittings to connect the plant & it's accessories from power source is in vendor's scope.
12. Separate list of spares along with rate, required for smooth functioning of the plant & it's accessories. The list is solely required with respect to future requirements/reference of Plant. Hence total cost of items from the list should not be the part of final price of tender quote.