

## Section 6- Schedule of supply

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## 1. List of Goods and Related Services

**Package Name: Supply of Mechanical and related equipment's for Industrial Training Institutes to enhance technical and vocational skills among the youth of Himachal Pradesh (Package -04)**

The Goods and Related Services are grouped in Lots. Bidders shall have the option of submitting Bids for one, any combination, or all of the lots. Lots shall not be further subdivided for the purpose of bidding. The bidder is required to supply the items as mentioned below for the respective Package and Lot(s) for which bidding.

Besides the supply of equipment, the bidder shall also carry-out required related services including unloading, installation & commissioning, after sales warranty & maintenance as well as the relevant handholding to the trainers of the ITI for proper usage and operations. The bidder shall do the necessary site preparation including electrical work, earthing, minor civil work, etc. as required for installation & commissioning of the equipment's/goods. While doing the site preparation the bidder shall ensure that aesthetics of the labs/workshops, IT Lab and the Library shall maintain /restored.

Lot No: 2							
Lot Name: Tool & Die and PPO related machinery							
Item No	Name of Goods or Related Services	Description	Unit of Measure -ment	Quantity	Specification by the supplier (To be filled by the supplier)	Detailed information brochure attached at Page No.	Pass/Fail (By Purchaser)
1.	Test Equipment for plastic -MFI	<b>Test Equipment for plastic -MFI</b> - Range: 40 – 400°C - Resolution: 0.1°C - Accuracy : 0.2°C - Power 120V/230V; 50Hz/60Hz  <b>Temperature Probe Specifications</b> Measurement 3 x PT 100 Sensors - Range : 0 – 500°C - Accuracy: 0.1°C	No.	1			

<b>2.</b>	Digitally controlled Universal Testing machine of 100 KN capacity	<b>Digitally controlled Universal Testing machine :</b> <ul style="list-style-type: none"> <li>- Maximum Capacity: 100 KN</li> <li>- 1st Measuring Range : 0-20 KN</li> <li>- Load Resolution : 0.005 KN</li> <li>- 2nd Measuring Range : 0-40 KN</li> <li>- Load Resolution: 0.01 KN</li> <li>- 3rd Measuring Range: 0-100 KN</li> <li>- Load Resolution: 0.025 KN</li> <li>- Resolution of Piston Movement (Displacement): 0.1 mm</li> <li>- Clearance for tensile test at fully descended working piston : 50-700 mm</li> <li>- Clearance for compression test at fully descended working piston : 0-700 mm</li> <li>- Clearance between columns: 500 mm</li> <li>- Straining / Piston speeds (at no load): 0-150 mm</li> <li>- Voltage: 440 V, 3 Phase</li> </ul>	No.	1			
<b>3.</b>	Impact tester	<b>Impact tester:</b> <ul style="list-style-type: none"> <li>- Maximum capacity: 300 J</li> <li>- Minimum scale graduation :2 J</li> <li>- Pendulum drop angle: 140°</li> <li>- Pendulum effective Wt.: 21.819 kg.</li> <li>- Striking velocity of pendulum: 5.182 m/sec</li> </ul>	No.	1			
<b>4.</b>	Hand operated Injection Moulding machine of 15 gm capacity	<b>Hand operated Injection Moulding machine:</b> <ul style="list-style-type: none"> <li>- Minimum Capacity: 15gm</li> <li>- Temperature controller unit: 0- 200°C</li> <li>- Weight of piece: Minimum 15 gm</li> </ul>	No.	3			
<b>5.</b>	Hand operated Injection Moulding machine of 30gm capacity	<b>Hand operated Injection Moulding machine</b> <ul style="list-style-type: none"> <li>- Minimum Capacity : 30 gm</li> <li>- Temperature controller unit : 0- 200°C</li> <li>- Weight of piece : Minimum 30 gm</li> </ul>	No.	3			

6.	Microprocessor/PLC controller Automatic screw type Injection Moulding Machine of 80-85 tons capacity	<b>Screw Type Injection Moulding Machine :</b> <ul style="list-style-type: none"> <li>- Capacity 80 to 85 T with the following minimum specifications:</li> <li>- Screw diameter (mm) :36 mm</li> <li>- Injection Pressure (bar) : 1,815</li> <li>- Stroke Volume : 163 cm<sup>3</sup></li> <li>- Screw Stroke : 160 mm</li> <li>- Max Injected Weight(GPPS) gm :155</li> <li>- Injection Rate cc/s :141</li> <li>- Plasticising rate(GPPS)@ speed g/s :17</li> <li>- Screw Speed : 350 rpm</li> <li>- L/D Ratio :21.2</li> <li>- Heating Capacity :8.9 KW</li> <li>- No of Heating Zones :5</li> <li>- Nozzle Protrusion :45 MM</li> <li>- Nozzle Contact Force : 60 kN</li> <li>- Oil Tank capacity : 200 Ltr.</li> <li>- Hopper Capacity : 60 Ltr.</li> </ul> <b>CLOSING UNIT</b> <ul style="list-style-type: none"> <li>- Closing Force : 1000 KN</li> <li>- Mould Open Stroke : 350 mm</li> <li>- Mould Height :180-410 mm</li> <li>- Distance between Platens : 760 mm</li> <li>- Distance between Tie-Bars(hxv):410X410 mm</li> <li>- Clamping Platens(hxv):610X610 mm</li> <li>- Ejector Force :51 KN</li> <li>- Ejector Stroke :130 mm</li> </ul>	No.	3			
7.	Hand operated Compression Moulding Machine of 60 ton capacity	<b>Hand operated Compression Moulding Machine of 30-60 tons capacity :</b> <ul style="list-style-type: none"> <li>- Suitable for processing Acrylonitrile Butadiene Styrene(ABS)-</li> <li>- Maximum working pressure = 25 kN</li> </ul>	No.	5			

		<ul style="list-style-type: none"> <li>- Pressure gauge : Analog Type</li> <li>- Heated Platen area = 200x 200 mm</li> <li>- Maximum travel distance of platen = 150 mm max</li> <li>- Maximum working temp = 200 degree C</li> <li>- Digital Temperature control with an accuracy of <math>\pm 2^{\circ}\text{C}</math></li> </ul>					
8.	Hand operated Blow Moulding Machine of 250 ml capacity	<b>Hand operated Blow Moulding Machine of 250 ml capacity :</b> <ul style="list-style-type: none"> <li>- Minimum Manufacturing capacity: 8 inches</li> <li>- Plasticising capacity : 1.5kg/hr</li> <li>- Minimum Shots per hour : 100</li> <li>- Screw Dia - 38mm</li> <li>- Max article weight - 50gm</li> <li>- Max mould size : 120x130</li> <li>- Max mould open stroke : 125mm</li> <li>- Max Volume : 250ml</li> </ul>	No.	3			
9.	Hand Injection Moulding Machine	<b>Hand operated Injection Moulding machine:</b> <ul style="list-style-type: none"> <li>- Minimum Capacity : 50 gm</li> <li>- Temperature controller unit : 0- 200°C</li> <li>- Weight of piece : Minimum 50 gm</li> </ul>	No.	2			
10	Microprocessor/PLC controller based Automatic compression moulding machine of 100 tons capacity	<b>Microprocessor / PLC controller based Automatic compression moulding machine :</b> <ul style="list-style-type: none"> <li>- Capacity Minimum : 100 Tons;4 pillars type up stroking ram movement.</li> <li>- Minimum Stroke Length : 510 mm</li> <li>- Minimum Shut Height :190 mm</li> <li>- Minimum Platen size :600 x 600 mm</li> <li>- Electrical heating load of the platens: 6 KW / Platen</li> <li>- Operation: PLC based touch type screen.</li> </ul>	No.	1			

<b>11</b>	Microprocessor/PLC controller based Automatic Extrusion Blow moulding machine of 2 litres capacity	<b>Automatic Extrusion Blow Moulding Machine</b> <ul style="list-style-type: none"> <li>- Capacity: 1 to 2 litre</li> <li>- Screw Dia. (mm): 32-50</li> <li>- Screw Speed: 1-60 m/sec</li> <li>- Platen Length Size: 200-610 mm</li> <li>- Platen Width Size: 200-610 mm</li> </ul>	No.	1			
<b>12</b>	Extruder of 40kg/hr Plasticizing capacity with re-processing die and granulator/cutter for PE & PP.	<b>Extruder of 40 kg/hr Plasticizing capacity with re-processing die and granulator/cutter for PE &amp; PP.</b> <p>with the following minimum specifications:</p> <ul style="list-style-type: none"> <li>- Output: 40Kg /hr</li> <li>- Screw dia x L/D : 40 x 24mm</li> <li>- Control : Through Variable Frequency AC Drive</li> <li>- Speed reducer type : Helical gear box with inbuilt thrust bearing,</li> <li>- Feed section : Grooved sleeve</li> <li>- Thrust capacity (Dynamic) : 397KN</li> <li>- Lubrication : Sump type</li> <li>- Power transmission :Through pulley and V-belts</li> <li>- Hopper Capacity : 35 litre. , Stainless Steel</li> <li>- Material for screw and barrel : Nitralloy steel</li> <li>- Barrel heating load : with ceramic heaters)</li> <li>- Barrel cooling : 1 No. cooling blower</li> <li>- Screen Pack : Cylindrical screen pack with strainer</li> <li>- Heating load : with ceramic heaters)</li> <li>- Temperature controllers : Digital PID controllers, Range0- 400°C.</li> <li>- A motorized cutter with motor for PE &amp; PP</li> </ul>	No.	1			

13	Pipe extruder of Minimum 40 kg/hr. Plasticizing capacity with pipe die 0.5 inch and 1 inch	<p><b>Pipe extruder of Minimum 40 kg/hr. Plasticizing capacity with pipe die 0.5 inch and 1 inch:</b> with the following minimum specifications;</p> <ul style="list-style-type: none"> <li>- Maximum output: 40Kg/hr</li> <li>- Screw dia x L/D Ratio : 65mm, 28:1</li> <li>- Screw Speed Range : 14 - 140rpm</li> <li>- Barrel Heating : Ceramic Band Heaters</li> <li>- Heating load:10.5Kw, No. of zones : 5</li> <li>- Barrel Cooling : Provided in 5 zones each by means of 0.18 Kw, having auto on-off arrangement.</li> <li>- Feed system : Hopper of 125 litr. capacity.</li> <li>- Main motor rating :AC Motor,</li> <li>- Drive : AC variable frequency drive</li> </ul> <p><b>DIE HEAD</b> Pipe dia range : 20 to 50 mm No. of heating zones : 5</p> <p><b>VACUUM SIZING TANK</b> Cross Section of Tank Profile Octagonal</p> <ul style="list-style-type: none"> <li>- Standard Pipe dia range :20 – 110mm;</li> <li>- Length of cooling section : 6000mm</li> <li>- Through Size: 325 x 350mm;</li> <li>- Vacuum Pump, Spray Pump</li> <li>- Centre height of work: 1150mm</li> </ul> <p><b>TUBE TRACTION UNIT.</b></p> <ul style="list-style-type: none"> <li>- Pipe size :20- 110 mm; No. of Tracks :2; Length of contact: 800 mm</li> <li>- Operating distance of grips Min. 0 mm, Max. 250 mm</li> </ul> <p><b>TUBE CUTTING UNIT.</b></p> <ul style="list-style-type: none"> <li>- Pipe dia range :20 - 110 mm ; Blade dia : 350 mm ; Trolley stroke : 1100 mm</li> <li>- No. of cuts :12; Cutter, Trolley Retraction</li> </ul> <p>Pneumatic cylinder 50x1200mm</p> <p><b>UTILITIES REQUIRED</b></p> <ul style="list-style-type: none"> <li>- Compressed Air : 2.5 m3/hr. at 7 Bar;</li> <li>- Cooling Water : 6.6 lps (22m head) 15 °C</li> <li>- Chilling Plant : 25 TR;</li> <li>- Electrical Power Supply : 415V, 3 Phase, 50 Hz</li> <li>- Voltage Stabilizer of suitable capacity.</li> </ul>	No.	1			
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14	Extruder of 40 kg/hr. Plasticizing capacity	<p><b>Extruder of 40 kg/hr. Plasticizing capacity with Die -18inch LFW &amp; Accessories :</b></p> <ul style="list-style-type: none"> <li>- Maximum output: 40Kg/Hr.</li> <li>- Film : Single Layer Flattened Tubular</li> <li>- Film Layout Width ( LFW) : 300 - 650 mm for HDPE ;Thickness : 6-70 micron ; Output : 40-45Kg/Hr</li> </ul> <p><b>EXTRUDER</b> : -Screw dia x L/D : 40 x 24mm</p> <ul style="list-style-type: none"> <li>- Control Through Variable Frequency AC Drive</li> <li>- Speed reducer type :Helical gear box with inbuilt thrust bearing , Lubrication : Sump type</li> <li>- Hopper Capacity : 35 litre;</li> <li>- No. of heating zones : 2 ; Barrel cooling : 1</li> </ul> <p>No. cooling blower</p> <ul style="list-style-type: none"> <li>- Screen Pack : Cylindrical screen pack with strainer</li> </ul> <p><b>DIE</b> : - Die size : 100 mm ;Design : Spiral Mandrel type; Working direction :Upwards</p> <ul style="list-style-type: none"> <li>- Material &amp; surface Treatment : High strength steel with - Electro-less Nickel plating on full melt path.</li> <li>- Die gap adjustment : By moving die ring with the adjusting bolts</li> <li>- No of heating zones : 05</li> </ul> <p><b>COOLING SYSTEM AIR COOLING RING</b> : Type : Single lip</p> <p><b>COOLING BLOWER</b> : Type : Centrifugal Drive type/load , 2.2KW , AC Induction motor</p> <p><b>TAKE OFF UNIT NIP ROLLER UNIT</b> : Roll width : 750mm ; Roll material : One rubber roller &amp; one steel roller;</p> <ul style="list-style-type: none"> <li>- Nip actuation : Pneumatic;</li> <li>- Power Transmission : Through Chain &amp; Sprocket ; Haul-off speed rang : 8-80 m/min</li> </ul> <p><b>COLLAPSING BOARD</b>: Type :Fix type, mounted on MS frame ;Contact Material: Velvet on Wooden Slat</p> <p><b>SINGLE STATION WINDER</b> : Type : Surface winder ; Roller width : 750mm; Roller Material : Neoprene Rubber, Application: Winding of flattened film ; No of stations :One</p> <ul style="list-style-type: none"> <li>- Winder drive : AC; Torque, Expander roller: Base Standard roller</li> </ul>	No.	1			
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		<ul style="list-style-type: none"> <li>- Core Tube Details: 75 (ID) x 95 (OD) x 750 (L)</li> </ul> <p><b>ELECTRICALS</b> :Temperature controllers : Standard make Digital PID - controllers Range 0 - 400° C (± 1° C) with necessary circuitry Drive ;Variable frequency AC Drive with necessary circuitry</p> <ul style="list-style-type: none"> <li>- Switch Gears : Reputed make and of adequate capacity; Panels : Powder coated Panels with exhaust fan</li> </ul> <p><b>CONNECTED LOAD</b> : Drive Load : 15 KW ; Heating Load : 15KW</p>					
15	Automatic Thermo/Vacuum forming Machine with Mould	<p><b>Thermo/Vacuum forming Machine with Mould :</b></p> <ul style="list-style-type: none"> <li>- Connecting Load :22 kw</li> <li>- Cycle time :4 to 5 min</li> <li>- Vacuum Power: 50 mm Hg</li> <li>- Minimum Thickness of Foil :0.35 mm</li> <li>- Maximum Thickness of Foil : 0.40 mm</li> <li>- Heat Producer System Tubes</li> <li>- Motor: 1440 RPM</li> </ul>	No.	1			
16	Automatic Rotational moulding Machine with Moulds	<p><b>Automatic Rotational Moulding Machine with two moulds :</b></p> <ul style="list-style-type: none"> <li>- Spindles: 1</li> <li>- Maximum Weight on Straight Arm: 600 Kg</li> <li>- Spider Diameter: 1500 mm</li> <li>- Major Axis R.P.M. (x-axis): 0-4</li> <li>- Minor Axis R.P.M. (y-axis): 0-6</li> </ul> <p><b>Furnace / Oven :</b></p> <ul style="list-style-type: none"> <li>- Maximum Kcal / Hr : 200,000</li> <li>- Usage Normal (Kcal/cycle) : 50,000</li> <li>- Maximum Temperature °C : 250</li> <li>- Circulating Blower C.F.M : 9,000</li> <li>- Oven Circulating Blower</li> <li>- Major Axis Drive AC Motor</li> <li>- Minor Axis Drive AC Motor, - Burner</li> <li>- Operating Voltage: 415 V, 50 Hz ,3Ph</li> </ul>	No.	1			

<b>17</b>	Stretch Blow Moulding Machine of 1 Litre capacity with mould	<b>Stretch Blow Moulding Machine-1 Litre with mould :</b> <ul style="list-style-type: none"> <li>- Capacity - 50 ml to 1000 ml minimum</li> <li>- Production Capacity - 1100~1200 BPH</li> <li>- Max. Mould thickness - 150 MM</li> <li>- Min. Mould thickness - 140 MM</li> <li>- Clamping force - 8 Ton</li> </ul> <b>Oven:</b> <ul style="list-style-type: none"> <li>- Number of Preform Holders - 74</li> <li>- Number of Heating modules - 1</li> <li>- Number of Heating zones - 6</li> <li>- Lamp Power - 2000 W</li> <li>- Number of stretch Rods - 2</li> <li>- Stretching stroke Max. - 400 MM</li> </ul>	No.	1			
<b>18</b>	Air blow gun with standard accessories	<b>Air blow gun with standard accessories:</b> <ul style="list-style-type: none"> <li>- Material: Stainless Steel</li> <li>- Working Pressure: 4-8 Bar</li> <li>- Avg. Air Consumption: 10 to 15 CFM</li> <li>- Air Hose Size: 3/8"</li> </ul>	No.	1			

**Note: For detailed specifications please refer table 3: Technical Specifications**

## 2. Delivery and Completion Schedule

The delivery period shall start as of *date of Signing the Contract*

Lot No.	Description of Goods or Related Services	Delivery Schedule (Duration)	Location	Required Arrival Date of Goods or Completion Date for Related Services
Lot-2	Lot 2: Tool & Die and PPO related machinery	Within 365 Days from the Signing of the contract.	<b>The location of Delivery of various items of Lot-2 attached separately</b>	Within 365 Days from the Signing of the contract.

### 3. Technical Specifications

<b>Special Note: 1</b>	As a part of Documentation even if not mentioned all items supplied shall have minimum of 1. User/Operation Manual and 2. Warranty Certificate. Additional requirements for specific items will be explicitly mentioned.
<b>Special Note: 2</b>	The installation has to be carried out as per the guidelines given by the OEM with necessary ground work and fixtures wherever necessary.
<b>Special Note: 3</b>	All Light, Medium and Heavy machineries and item needing installation either on Ground or on Wall is the sole responsibility of the supplier.
<b>Special Note: 4</b>	All costs involved in installation such as materials and Labour is to be borne by the Supplier.
<b>Special Note: 5</b>	Machines and items shall be installed at the identified position in the designated ITI workshop /Laboratory.
<b>Special Note: 6</b>	Warranty of One/Two/.. / means that the Supplier of the item takes full responsibility in ensuring the best working condition of the item during the warranty period.
<b>Special Note: 7</b>	In the event the item is not working the OEM ensure that the item is brought back to best working condition with-in a reasonable period of time not more than 5 days in the worst case.
<b>Special Note: 8</b>	All parts of the machine not intentionally damaged by the user should be replaced free of cost by the supplier.
<b>Special Note: 9</b>	All consumable items if any needing replacement will be supplied by the ITI.
<b>Special Note: 10</b>	All Items of delicate nature shall be supplied in a suitable Cloth/Wooden/ Other suitable storage case/cover for protection of the item from dust and moisture.
<b>Special Note: 11</b>	Detailed information brochures having specifications, make and model number of individual item to be attached.

#### Lot 2: Tool & Die and PPO related machinery

Item No.	Name of Goods or Related Services	Technical Specifications of Item and/or Bureau of Indian Standards (BIS) (if applicable) reference	Features	Accessories	Spare parts	Documents	Installation & Training	Warranty of Equipmen t/parts
1.	Test Equipment for plastic -MFI	<b>Test Equipment for plastic -MFI</b> - Range: 40 – 400°C - Resolution:0.1°C - Accuracy :0.2°C - Power 120V/230V; 50Hz/60Hz  <b>Temperature Probe Specifications</b> Measurement 3 x PT 100 Sensors - Range : 0 – 500°C - Accuracy: 0.1°C	- Must be able to check the Melt Flow Index of all Thermoplastic material	- Temperature probe - Die - Piston, - Barrel core - Die cleaning tool - Die Retainer Cleaning probe	- Stand ard	- User/Opera ting Manual - List of Service Centres in India - Warranty Certificate	- To be supplied at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	One Year

				<ul style="list-style-type: none"> <li>- Filling funnel</li> <li>- Test Weights</li> <li>- Cleaning patches</li> <li>- Heat resistant gloves</li> </ul>				
2.	Digitally controlled Universal Testing machine of 100 KN capacity	<b>Digitally controlled Universal Testing machine :</b> <ul style="list-style-type: none"> <li>- Maximum Capacity: 100 KN</li> <li>- 1st Measuring Range : 0-20 KN</li> <li>- Load Resolution : 0.005 KN</li> <li>- 2nd Measuring Range : 0-40 KN</li> <li>- Load Resolution: 0.01 KN</li> <li>- 3rd Measuring Range: 0-100 KN</li> <li>- Load Resolution: 0.025 KN</li> <li>- Resolution of Piston Movement (Displacement): 0.1 mm</li> <li>- Clearance for tensile test at fully descended working piston : 50-700 mm</li> <li>- Clearance for compression test at fully descended working piston : 0-700 mm</li> <li>- Clearance between columns: 500 mm</li> <li>- Straining / Piston speeds (at no load): 0-150 mm</li> <li>- Voltage: 440 V, 3 Phase</li> </ul>	- Standard	<b>For tension test:</b> <ul style="list-style-type: none"> <li>- Clamping for round: 10-20 mm</li> <li>- Specimens diameters : 20-30 mm</li> <li>- Clamping jaws for flat: 0-10 mm</li> <li>- Specimens thickness: 10-20 mm</li> <li>- Width : 50 mm</li> </ul> <b>For compression test:</b> <ul style="list-style-type: none"> <li>- Pair of compression plates of diameter: 120 mm</li> </ul> <b>For transverse test:</b>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be supplied at designated ITI's in Himachal Pradesh</li> <li>- Training as required by staff of ITI</li> </ul>	One Year

				<ul style="list-style-type: none"> <li>- Table with adjustable rollers width of rollers: 160 mm</li> <li>- Diameter of Rollers: 30 mm</li> <li>-Maximum clearance between Supports: 500 mm</li> </ul>				
3.	Impact tester	<b>Impact tester :</b> <ul style="list-style-type: none"> <li>- Maximum capacity : 300 J</li> <li>- Minimum scale graduation :2 J</li> <li>- Pendulum drop angle : 140°</li> <li>- Pendulum effective Wt. : 21.819 kg.</li> <li>- Striking velocity of pendulum: 5.182 m/sec</li> </ul>	- Suitable for Charpy and Izod Impact Test	- Standard	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be supplied at designated ITI's in Himachal Pradesh</li> <li>- Training as required by staff of ITI</li> </ul>	One Year
4.	Hand operated Injection Moulding machine of 15 gm capacity	<b>Hand operated Injection Moulding machine :</b> <ul style="list-style-type: none"> <li>- Minimum Capacity : 15gm</li> <li>- Temperature controller unit : 0-200°C</li> <li>- Weight of piece : Minimum 15 gm</li> </ul>	- Solid Frame made up of Heavy channel with a heavy base	<ul style="list-style-type: none"> <li>- Die</li> <li>- Ceramic Band Heater</li> <li>- Other standard Accessories</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be supplied at designated ITI's in Himachal Pradesh</li> <li>- Training as required by staff of ITI</li> </ul>	one Year
5.	Hand operated Injection Moulding	<b>Hand operated Injection Moulding machine :</b> <ul style="list-style-type: none"> <li>- Minimum Capacity : 30 gm</li> </ul>	- Solid Frame made up of Heavy	<ul style="list-style-type: none"> <li>- Die</li> <li>- 02 Nos Ceramic Band</li> </ul>	- Standard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> </ul>	<ul style="list-style-type: none"> <li>- To be supplied at designated</li> </ul>	one Year

	machine of 30gm capacity	<ul style="list-style-type: none"> <li>- Temperature controller unit : 0-200°C</li> <li>- Weight of piece : Minimum 30 gm</li> </ul>	channel with a heavy base	Heater <ul style="list-style-type: none"> <li>- One No. suitable mould</li> <li>- Other standard Accessories</li> </ul>		<ul style="list-style-type: none"> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	ITI's in Himachal Pradesh <ul style="list-style-type: none"> <li>- Training as required by staff of ITI</li> </ul>	
6.	Microprocessor/ PLC controller Automatic screw type Injection Moulding Machine of 80-85 tons capacity	<b>Screw Type Injection Moulding Machine :</b> <ul style="list-style-type: none"> <li>- Capacity 80 to 85 T with the following minimum specifications:</li> <li>- Screw diameter (mm) :36 mm</li> <li>- Injection Pressure (bar) : 1,815</li> <li>- Stroke Volume : 163 cm<sup>3</sup></li> <li>- Screw Stroke : 160 mm</li> <li>- Max Injected Weight(GPPS) gm :155</li> <li>- Injection Rate cc/s :141</li> <li>- Plasticising rate(GPPS)@ speed g/s :17</li> <li>- Screw Speed : 350 rpm</li> <li>- L/D Ratio :21.2</li> <li>- Heating Capacity :8.9 KW</li> <li>- No of Heating Zones :5</li> <li>- Nozzle Protrusion :45 MM</li> <li>- Nozzle Contact Force : 60 kN</li> <li>- Oil Tank capacity : 200 Ltr.</li> <li>- Hopper Capacity : 60 Ltr.</li> </ul> <b>CLOSING UNIT</b> <ul style="list-style-type: none"> <li>- Closing Force : 1000 KN</li> <li>- Mould Open Stroke : 350 mm</li> <li>- Mould Height :180-410 mm</li> <li>- Distance between Platens : 760 mm</li> <li>- Distance between Tie-</li> </ul>	<ul style="list-style-type: none"> <li>- Five-point double clamping system of steel casting with steel link and steel bushes.</li> <li>- Mould opening &amp; closing with programmable and independent strokes and speed.</li> <li>- Automatic lubrication system is toggle side clamping and injection strokes are monitored by linear transducers.</li> <li>- Single stroke hydraulic</li> </ul>	<ul style="list-style-type: none"> <li>- One No. suitable mould</li> <li>- Other standard Accessories</li> </ul>	Stand ard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be supplied at designated ITI's in Himachal Pradesh</li> <li>- Training as required by staff of ITI</li> </ul>	<ul style="list-style-type: none"> <li>- Two years from Date of Installation</li> </ul>

		Bars(hxv):410X410 mm - Clamping Platens(hxv):610X610 mm - Ejector Force :51 KN - Ejector Stroke :130 mm	ejector. - Square tie bar distance with large mould height. - High tensile, hard chrome plated tie bar. - Electrical inter lock in front and rear safety guard. - Ceramic band heaters. - High torque hydraulic motor for screw drive. - Automatic suck back system. - Two stage injection speed. - Gas nitrided screw barrel with standard L/D ratio. - Injection movement is actuated by two hydraulic cylinder. - Stainless steel hopper with magnetic					
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			grill with swivelling system to permit easy change of material. - Limit switches controlled operation, for stroke control. - MCB control for each heating zone separately. - Star delta starter for pump motor. - Overload protection for pump motor. - Centralized automatic lubrication system. - Air injector with timer.					
7.	Hand operated Compression Moulding Machine of 60 ton capacity	<b>Hand operated Compression Moulding Machine of 30-60 tons capacity :</b> - Suitable for processing Acrylonitrile Butadiene Styrene(ABS)- - Maximum working pressure =	- A Sturdy & heavy body made up of cast steel, hardened & chrome plated with a heavy	- One No. Suitable mould - Other standard Accessories	- Stand ard	- User/Operating Manual - List of Service Centres in India	- To be supplied at designated ITI's in Himachal Pradesh - Training	one Year

		25 kN - Pressure gauge : Analog Type - Heated Platen area = 200x 200 mm - Maximum travel distance of platen = 150 mm max - Maximum working temp = 200 degree C - Digital Temperature control with an accuracy of $\pm 2^{\circ}\text{C}$	base enough to withstand impact & load.			- Warranty Certificate	as required by staff of ITI	
8.	Hand operated Blow Moulding Machine of 250 ml capacity	<b>Hand operated Blow Moulding Machine of 250 ml capacity :</b> - Minimum Manufacturing capacity: 8 inches - Plasticising capacity : 1.5kg/hr - Minimum Shots per hour : 100 - Screw Dia - 38mm - Max article weight - 50gm - Max mould size : 120x130 - Max mould open stroke : 125mm - Max Volume : 250ml	- A Sturdy & heavy body made up of cast steel ,hardened & chrome plated with a heavy base enough to withstand impact & load and having temperature controller with graduations.	- One No. Suitable mould - Other standard Accessories	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificate	- To be supplied at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	one Year
9.	Hand Injection Moulding Machine	<b>Hand operated Injection Moulding machine :</b> - Minimum Capacity : 50 gm - Temperature controller unit : 0-200°C - Weight of piece : Minimum 50 gm	- Solid Frame made up of Heavy channel with a heavy base	- Die - 02 Nos Ceramic Band Heater - One No. suitable mould - Other standard Accessories	Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificate	- To be supplied at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	one Year

10.	Microprocessor/ PLC controller based Automatic compression moulding machine of 100 tons capacity	<b>Microprocessor / PLC controller based Automatic compression moulding machine :</b> - Capacity Minimum : 100 Tons;4 pillars type up stroking ram movement. - Minimum Stroke Length : 510 mm - Minimum Shut Height :190 mm - Minimum Platen size :600 x 600 mm - Electrical heating load of the platens: 6 KW / Platen - Operation: PLC based touch type screen.	- Standard	- one no. suitable mould - Other standard Accessories	- Stand ard	- User/Opera ting Manual - List of Service Centres in India - Warranty Certificate	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	- Two years from Date of Installat ion
11.	Microprocessor/ PLC controller based Automatic Extrusion Blow moulding machine of 2 litres capacity	<b>Automatic Extrusion Blow Moulding Machine</b> - Capacity: 1 to 2 litre - Screw Dia. (mm): 32-50 - Screw Speed: 1-60 m/sec - Platen Length Size: 200-610 mm - Platen Width Size: 200-610 mm	- A Sturdy & heavy body made up of cast steel, hardened & chrome plated with a heavy base enough to withstand impact & load and having digital temperature controller	- One No. Suitable mould - Other standard Accessories	- Stand ard	- User/Opera ting Manual - List of Service Centres in India - Warranty Certificate	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	- Two years from Date of Installat ion
12.	Extruder of 40kg/hr Plasticizing capacity with re-processing die and granulator/cutt	<b>Extruder of 40 kg/hr Plasticizing capacity with re- processing die and granulator/cutter for PE &amp; PP.</b> with the following minimum specifications: - Output: 40Kg /hr	<b>Controls are housed in the cabinet including :-</b> - PID temperature controllers,	- Pair of compression plates of diameter: 120 mm - 'Two no Ceramic Band	- Stand ard	- User/Opera ting Manual - List of Service Centres in India	- To be supplied and installed at designated ITI's in Himachal	- Two years from Date of Installat ion

	er for PE & PP.	<ul style="list-style-type: none"> <li>- Screw dia x L/D : 40 x 24mm</li> <li>- Control : Through Variable Frequency AC Drive</li> <li>- Speed reducer type : Helical gear box with inbuilt thrust bearing,</li> <li>- Feed section : Grooved sleeve</li> <li>- Thrust capacity (Dynamic) : 397KN</li> <li>- Lubrication : Sump type</li> <li>- Power transmission :Through pulley and V-belts</li> <li>- Hopper Capacity : 35 litre. , Stainless Steel</li> <li>- Material for screw and barrel : Nitralloy steel</li> <li>- Barrel heating load : with ceramic heaters)</li> <li>- Barrel cooling : 1 No. cooling blower</li> <li>- Screen Pack : Cylindrical screen pack with strainer</li> <li>- Heating load : with ceramic heaters)</li> <li>- Temperature controllers : Digital PID controllers, Range0- 400°C.</li> <li>- A motorized cutter with motor for PE &amp; PP</li> </ul>	<p>each with a built in indication to specify the deviation of any zone from the set temperature.</p> <ul style="list-style-type: none"> <li>- Ammeter for indicating heating load of any individual zones.</li> <li>- Screw speed indicator.</li> <li>- Main isolator (On/Off) switch.</li> <li>- Other necessary electrical components like MCBs, Contactors, Relays, Push Buttons (On/Off), etc.</li> <li>- "PID" thermo controller with "SCR" output temperature systems to minimize power</li> </ul>	<p>Heater for barrel</p> <ul style="list-style-type: none"> <li>- Other standard accessories</li> </ul>		<ul style="list-style-type: none"> <li>- Warranty Certificate</li> </ul>	<p>Pradesh</p> <ul style="list-style-type: none"> <li>- Training as required by staff of ITI</li> </ul>	
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			consumption and maintain temperature levels - High efficiency driving motor and gears.					
13.	Pipe extruder of Minimum 40 kg/hr. Plasticizing capacity with pipe die 0.5 inch and 1 inch	<b>Pipe extruder of Minimum 40 kg/hr. Plasticizing capacity with pipe die 0.5 inch and 1 inch:</b> with the following minimum specifications; - Maximum output: 40Kg/hr - Screw dia x L/D Ratio : 65mm, 28:1 - Screw Speed Range : 14 - 140rpm - Barrel Heating : Ceramic Band Heaters - Heating load:10.5Kw, No. of zones : 5 - Barrel Cooling : Provided in 5 zones each by means of 0.18 Kw, having auto on-off arrangement. - Feed system : Hopper of 125 liter capacity. - Main motor rating :AC Motor, - Drive : AC variable frequency drive <b>DIE HEAD</b> Pipe dia range : 20 to 50 mm No. of heating zones : 5  <b>VACUUM SIZING TANK</b> Cross Section of Tank Profile Octagonal - Standard Pipe dia range :20 – 110mm; - Length of cooling section : 6000mm - Through Size: 325 x 350mm; - Vacuum Pump, Spray Pump - Centre height of work: 1150mm	- Screw & Barrel material Nitride hardened, ground and polished. - Barrel Single piece, cylindrical type with central feed opening - Feed section should have jacket type construction for water cooling. - Glass windows for visual inspection and chute arrangement provided. - Transmission system By V belts from main motor to helical gear box. - Safety guards should be	- 20 meter high pressure pipe - Other standard accessories	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificate	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	- Two years from Date of Installation

		<p><b>TUBE TRACTION UNIT.</b></p> <ul style="list-style-type: none"> <li>- Pipe size :20- 110 mm; No. of Tracks :2; Length of contact: 800 mm</li> <li>- Operating distance of grips Min. 0 mm, Max. 250 mm</li> </ul> <p><b>TUBE CUTTING UNIT.</b></p> <ul style="list-style-type: none"> <li>- Pipe dia range :20 - 110 mm ; Blade dia : 350 mm ; Trolley stroke : 1100 mm</li> <li>- No. of cuts :12; Cutter, Trolley Retraction Pneumatic cylinder 50x1200mm</li> </ul> <p><b>UTILITIES REQUIRED</b></p> <ul style="list-style-type: none"> <li>- Compressed Air : 2.5 m3/hr. at 7 Bar;</li> <li>- Cooling Water : 6.6 lps (22m head) 15 °C</li> <li>- Chilling Plant : 25 TR;</li> <li>- Electrical Power Supply : 415V, 3 Phase, 50 Hz</li> <li>- Voltage Stabilizer of suitable capacity.</li> </ul>	<p>provided.</p> <ul style="list-style-type: none"> <li>- CONTROL SYSTEM</li> </ul> <p>Control Cabinet fabricated from steel sheets mounted on a sturdy fabricated frame.</p> <ul style="list-style-type: none"> <li>- <b>Controls are housed in the cabinet including :-</b></li> <li>- PID temperature controllers, each with a built in indication to specify the deviation of any zone from the set temperature.</li> <li>- Ammeter for indicating heating load of any individual zones.</li> <li>- Screw speed indicator.</li> <li>- Main isolator (On/Off) switch.</li> <li>- Other necessary electrical components</li> </ul>					
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			like MCBs, Contactors, Relays, Push Buttons (On/Off), etc. - "PID" thermo controller with "SCR" output temperature systems to minimize power consumption and maintain temperature levels - High efficiency driving motor and gears.					
14.	Extruder of 40 kg/hr. Plasticizing capacity	<b>Extruder of 40 kg/hr. Plasticizing capacity with Die -18inch LFW &amp; Accessories :</b> - Maximum output: 40Kg/Hr. - Film : Single Layer Flattened Tubular - Film Layout Width ( LFW ) : 300 - 650 mm for HDPE ; Thickness : 6-70 micron ; Output : 40-45Kg/Hr <b>EXTRUDER :</b> -Screw dia x L/D : 40 x 24mm - Control Through Variable Frequency AC Drive - Speed reducer type : Helical gear box with inbuilt thrust bearing , Lubrication : Sump type - Hopper Capacity : 35 litre; - No. of heating zones : 2 ; Barrel cooling : 1 No. cooling blower - Screen Pack : Cylindrical screen pack with strainer	- Power transmission Through pulley and V – belts - Material for screw and barrel : Nitralloy steel , gas nitrided <b>Controls are housed in the cabinet including :-</b> - PID temperature controllers - Ammeter for indicating	-Standard	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificate	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	- Two years from Date of Installation

	<p><b>DIE</b> : - Die size : 100 mm ;Design : Spiral Mandrel type; Working direction :Upwards</p> <ul style="list-style-type: none"> <li>- Material &amp; surface Treatment : High strength steel with - Electro-less Nickel plating on full melt path.</li> <li>- Die gap adjustment : By moving die ring with the adjusting bolts</li> <li>- No of heating zones : 05</li> </ul> <p><b>COOLING SYSTEM AIR COOLING RING</b> : Type : Single lip</p> <p><b>COOLING BLOWER</b> : Type : Centrifugal Drive type/load , 2.2KW , AC Induction motor</p> <p><b>TAKE OFF UNIT NIP ROLLER UNIT</b> : Roll width : 750mm ; Roll material : One rubber roller &amp; one steel roller;</p> <ul style="list-style-type: none"> <li>- Nip actuation : Pneumatic;</li> <li>- Power Transmission : Through Chain &amp; Sprocket ; Haul-off speed rang : 8-80 m/min</li> </ul> <p><b>COLLAPSING BOARD</b>: Type :Fix type, mounted on MS frame ;Contact Material: Velvet on Wooden Slat</p> <p><b>SINGLE STATION WINDER</b> : Type : Surface winder ; Roller width : 750mm; Roller Material : Neoprene Rubber, Application: Winding of flattened film ; No of stations :One</p> <ul style="list-style-type: none"> <li>- Winder drive : AC; Torque, Expander roller: Base Standard roller</li> <li>- Core Tube Details: 75 (ID) x 95 (OD) x 750 (L)</li> </ul> <p><b>ELECTRICALS</b> :Temperature controllers : Standard make Digital PID - controllers Range 0 - 400° C (± 1° C) with necessary circuitry Drive ;Variable frequency AC Drive with</p>	<p>heating load of any individual zones.</p> <ul style="list-style-type: none"> <li>- Screw speed indicator.</li> <li>- Main isolator (On/Off) switch.</li> <li>- Other necessary electrical components like MCBs, Contactors, Relays, Push Buttons (On/Off), etc.</li> <li>- "PID" thermo controller with "SCR" output temperature systems to minimize power consumption and maintain temperature levels</li> <li>- High efficiency driving motor and gears.</li> </ul>					
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		necessary circuitry - Switch Gears : Reputed make and of adequate capacity; Panels : Powder coated Panels with exhaust fan <b>CONNECTED LOAD</b> : Drive Load : 15 KW ; Heating Load : 15KW						
15.	Automatic Thermo/Vacuum forming Machine with Mould	<b>Thermo/Vacuum forming Machine with Mould :</b> - Connecting Load :22 kw - Cycle time :4 to 5 min - Vacuum Power: 50 mm Hg - Minimum Thickness of Foil :0.35 mm - Maximum Thickness of Foil : 0.40 mm - Heat Producer System Tubes - Motor: 1440 RPM	Standard	- Table with adjustable rollers width of rollers: 160 mm - one no. suitable mould - Other standard accessories	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificate	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	- Two years from Date of Installation
16.	Automatic Rotational moulding Machine with Moulds	<b>Automatic Rotational Moulding Machine with two moulds :</b> - Spindles: 1 - Maximum Weight on Straight Arm: 600 Kg - Spider Diameter: 1500 mm - Major Axis R.P.M. (x-axis): 0-4 - Minor Axis R.P.M. (y-axis): 0-6  <b>Furnace / Oven :</b> - Maximum Kcal / Hr : 200,000 - Usage Normal (Kcal/cycle) : 50,000 - Maximum Temperature °C : 250 - Circulating Blower C.F.M : 9,000 - Oven Circulating Blower	- Standard	- Two suitable moulds - Other standard accessories	- Standard	- User/Operating Manual - List of Service Centres in India - Warranty Certificate	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	- Two years from Date of Installation

		<ul style="list-style-type: none"> <li>- Major Axis Drive AC Motor</li> <li>- Minor Axis Drive AC Motor</li> <li>- Burner</li> <li>- Operating Voltage: 415 V, 50 Hz ,3Ph</li> </ul>						
17.	Stretch Blow Moulding Machine of 1 Litre capacity with mould	<b>Stretch Blow Moulding Machine- 1 Litre with mould :</b> <ul style="list-style-type: none"> <li>- Capacity - 50 ml to 1000 ml minimum</li> <li>- Production Capacity - 1100~1200 BPH</li> <li>- Max. Mould thickness - 150 MM</li> <li>- Min. Mould thickness - 140 MM</li> <li>- Clamping force - 8 Ton</li> </ul> <b>Oven:</b> <ul style="list-style-type: none"> <li>- Number of Preform Holders - 74</li> <li>- Number of Heating modules - 1</li> <li>- Number of Heating zones - 6</li> <li>- Lamp Power - 2000 W</li> <li>- Number of stretch Rods - 2</li> <li>- Stretching stroke Max. - 400 MM</li> </ul>	<ul style="list-style-type: none"> <li>- Infrared pre-heating system</li> <li>- Indexing conveyor</li> <li>- Steady perform rotating in pre-heater</li> <li>- Total Mercury pneumatic system &amp; water cooling system (push &amp; pull type)</li> <li>- Hydro-pneumatic locking systems with tools</li> <li>- 24 mould memory in PLC</li> <li>- 1 no. Neck Mandrel</li> </ul>	<ul style="list-style-type: none"> <li>- one no. suitable mould</li> <li>- Compressor: 20 HP High pressure , 2 nos. of cylinders, 3 piston, Displacement, CFM – 49.50,</li> <li>- Tank Capacity – 500 ltr.</li> <li>- 2 TR Chiller, Capacity : 9075 Kcal/hr., Compressor</li> <li>- Temperature: 16 to 18c</li> <li>- Air Dryer , 40 CFM / 40 BAR</li> <li>- Other standard accessories</li> </ul>	Stand ard	<ul style="list-style-type: none"> <li>- User/Operating Manual</li> <li>- List of Service Centres in India</li> <li>- Warranty Certificate</li> </ul>	<ul style="list-style-type: none"> <li>- To be supplied and installed at designated ITI's in Himachal Pradesh</li> <li>- Training as required by staff of ITI</li> </ul>	<ul style="list-style-type: none"> <li>- Two years from Date of Installation</li> </ul>

18.	Air blow gun with standard accessories	<b>Air blow gun with standard accessories :</b> - Material : Stainless Steel - Working Pressure: 4-8 Bar - Avg. Air Consumption: 10 to 15 CFM - Air Hose Size: 3/8"	- Rugged Construction - Easy to Operate	-Standard	- Standard	- User/Operating Manual - Warranty Certificates	- To be supplied and installed at designated ITI's in Himachal Pradesh - Training as required by staff of ITI	Two years from the date of Installation.
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## 4. Drawings

*Not Applicable*