To

Sir,

Sub: Inviting Quotations for procurement of Multiend Reeling Machine (6 basin Capacity) for STSC, JAMMU.-Reg.

With reference to the subject cited above, I am to inform that this Institute invites quotation in two bid system through e-procurement for supply of Multiend Reeling Machine (6 basin Capacity) for STSC, JAMMU as per the specification mentioned below:

<table>
<thead>
<tr>
<th>#</th>
<th>NAME OF THE EQUIPMENT</th>
<th>QTY</th>
<th>DESTINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Multiend Reeling Machine (6 basin Capacity) Detailed Specification as enclosed</td>
<td>1 No.</td>
<td>Silk Testing Service Centre, CSTRI, Central Silk Board, CSB Complex, Miransahib, Jammu-181101</td>
</tr>
</tbody>
</table>

**TERMS & CONDITION:**

1. The quotation in **two bid (Technical Bid & Financial Bid)** system should be uploaded in e-procurement only. ([website www.eprocure.gov.in](http://www.eprocure.gov.in)). The last date for upload the bid is **12.12.2019 upto 1 P.M.** and the bill will be opened on **13.12.2019 at 2 P.M.**

2. The rates quoted should be valid for **120 days**. The equipment should be supplied within **90 days** from the date of purchase order.

3. The equipment should be supplied to **Scientist `D', Silk Testing Service Centre, CSTRI, Central Silk Board, CSB Complex, Miransahib, Jammu-181101**

4. Financial Bids should consist of unit price, Excise Duty, Insurance, Packing & Forwarding, Erection & Commissioning, Transportation Charges, Taxes etc.,

5. The EMD of **Rs.25,000/=** should be paid in the form of Demand Draft drawn in favour of the **Director, CSTRI, Bangalore**. The EMD does not carry any interest. **Please note that cheques will not be accepted. Quotation received without EMD will summarily be rejected.** A scanned copy of Demand Draft obtained should be uploaded. For claiming exemption of EMD, the necessary MSME / NSIC certificate should be uploaded alongwith the technical bid.
6. The Supplier shall provide Warranty/Guarantee valid for a minimum period of 12 months from the date of installation of the equipment / machineries. Any defects noticed in the equipment / machineries which is unintentional shall be set right by the supplier free of cost for good performance of the equipments.

7. The equipment should be supplied strictly in conformity of the above specifications, failing which, the equipment has to be taken back at your own cost.

8. For delay & non supply of the item within the stipulated time, liquidated damages @ 0.5% per week will be deducted from the bill subject to a maximum of 10% of the total cost of the equipment.

9. The performance security equivalent to 5% of the total contract value in the form of Bank Guarantee issued by any Nationalized Bank which shall be valid till three months after the expiry of the Warranty period should be furnished to this Institute within 10 days from the date of receipt of purchase order in the prescribed format.

10. No advance payment will be made. The payment will be released only after delivery of the equipment in good condition as per our specification, Erection and commissioning.

11. The bidders should submit the Bank Details i.e. Bank A/c.No., Bank Name, Branch, IFSC code, Mobile No., eMail ID, Etc. along with quotation.

Yours faithfully,

Sd/-
DIRECTOR
The list of the machinery / equipments of 6 basin capacity Multiend reeling package is given Table 1.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the machine</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CSTRI Electrical Hot Air Drier- 50kg capacity</td>
<td>1No.</td>
</tr>
<tr>
<td>2</td>
<td>CSTRI Cocoon Sorting Table</td>
<td>1No.</td>
</tr>
<tr>
<td>3</td>
<td>CSTRI Circular Pressurised Cocoon Cooking machine / CSTRI Vacuum Permeation Cocoon Cooking Equipment</td>
<td>1No.</td>
</tr>
<tr>
<td>4</td>
<td>CSTRI Two pan cooking table</td>
<td>2-sets</td>
</tr>
<tr>
<td>5</td>
<td>6-Basin capacity CSTRI Multi-end Reeling Machine (10ends / basin)</td>
<td>1 No.</td>
</tr>
<tr>
<td>6</td>
<td>CSTRI Small Reel silk Permeation Chamber</td>
<td>1No.</td>
</tr>
<tr>
<td>7</td>
<td>6-Window capacity CSTRI Closed Type Re-reeling machine (5 ends / Window)</td>
<td>1No.</td>
</tr>
<tr>
<td>8</td>
<td>Epprouvette and Electronic Balance of 600 gm capacity with 0.01gm sensitivity</td>
<td>1No. each</td>
</tr>
<tr>
<td>9</td>
<td>Generator (7.5 KVA Capacity)</td>
<td>1No.</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS OF CSTRI ELECTRICAL HOT AIR DRIER**

i. **Capacity**: Capacity of the drier shall be 50 Kg.

ii. **Drying chamber**: Size of the chamber shall be of 4.5' height, 6' breadth and 3.5' length. The Chamber shall consist of sheathed air heaters of capacity of 9KW, suitably wired for three phase 440 volts distributed in two sides i.e. left and right sides of the chamber with uniform distribution of coils to provide uniform heating of the chamber. The Temperature uniformity shall ± 2°C. The chamber shall be provided with two doors with effective locking system at two places – top and bottom. The door of the chamber shall be airtight by using heat resistant silicon rubber beadings to withstand the temperature up to 200°C.

The outer and inside wall of the chamber and doors shall be made of M.S sheet of 18 SWG and in between with glass wool insulation of 75 mm thickness to avoid heat losses. The outside wall of the drier shall be painted with enamel paint and inside walls with heat resistant aluminum paint (Figures 1 to 3).

iii. **Cocoon holding trays and trolley**: Cocoon holding tray shall be of 3’ length x 2’ width x 2” height. All the four sides of cocoon tray shall be made out of Aluminum sheet of 1.2 mm thickness folded neatly and bottom of the tray shall be of 1/2” x ½” -14 SWG galvanized Iron (GI) wire mesh. All the side riveted with smooth surface and do not have sharp edges. 20 trays shall be housed inside the drying chamber with two trolleys (10 trays in each row). Each trolley dimension shall be of 24.5” breadth x 42”height x 36” length (as shown in the drawing). For easy loading of cocoon trolley, ramp system shall be provided to the drying chamber (Figures 4 & 5).

iv. **Air circulation**: Two outlets at the top of the chamber (circular in shape) having 10cm diameter and two outlets at the back side of the top of the chamber (Rectangular in shape) having dimension of 7.6cm x 15cm. All the outlets should be provided with SS mesh and baffle plates (spring loaded) for exhaust control. Two air inlets at the bottom of the chamber having dimension of 15cm x 7.6cm (covered with SS mesh and baffle plate arrangement) on either side of the drier are to be provided.

For effective air circulation, fans of capacity of 0.5 HP 3 phase with the speed of 1440 rpm shall be provided at both side (inside) of the chamber just above the heating coils. Size of the six blades fitted to each fan shall be of 16 “ length and 2.5” width.

v. **Control box**: A separate control panel board is to be provided outside the chamber. Electronic digital temperature indicator and controller shall be provided to indicate and control temperature of the oven. Panel board should have one main switch, 1 MCB, 1 cut off relay, 1 digital temperature controller (thermostat). The temperature range will be 0°C ~ 150°C. The control accuracy shall be ±1° C. The provision should be made for easy replacement of the damaged heating coils. Thermal over load (relay) protection for fan motors and MCB for
individual heaters apart from main control MCB shall be provided. Safety measures should be provided to avoid electrical shocks or accidents during the operation.

vi. **Power supply**: The oven shall be suitable for use on 440 volts, 50 Hz and Three Phase AC supply with an electrical load of 9 KW for heaters and 0.75 KW for motors.
Fig. 3

AIR CIRCULATION. FAN 2 NOS DRIVEN BY 1/2 HP MOTOR 1440 RPM OF WING DIA. 500MM TO BE MOUNTED ON TOP
OF HEATING COILS AND Dismantling TYPE MESH GUARD IS TO BE PROVIDED.

HEATING COILS
OF 9Kw GROUP
FIXED AT EACH SIDE. TOTAL 18Kw

HOT AIR OVEN SHEET
THREE OF SEVEN
SECTIONAL VIEW

HANDLE

SWIVEL WHEELS
AND FIXED WHEEL

TOP VIEW

Frame Made out of 1" x 1" x 16 gauge Square Tube of Bright Etal.

QTY: 2 NOS.

Fig 4.
HOT AIR OVEN SHEET
SIX OF SEVEN

Fig. 5
SPECIFICATIONS FOR CSTRI SORTING TABLE

I. TABLE

1. Made of 1" x 1" square pipe 16 gauge having height of 780 mm from floor level, width 600 mm and length 1400mm (Figures 19 and 20).
2. The legs of the table shall be welded by another square tube of the same cross section at the height of 320 mm from floor level. The square tube shall be extended to the front side by 500 mm for positioning the cocoon tray.
3. Rubber bushes of 1" size shall be provided to all the legs.
4. On the top of the table over the square tube to hold glass a rubber/wooden beading has to be provided as shown in figure. 25 mm height ridge with smooth finish shall be provided to avoid the cocoon falling from the sides of the table from 1mm CR sheet / wood.
5. Two sides (length wise) of the table and backside shall be covered by a M.S 20 gauge sheet. Inner side of the sheet shall be painted with white colour and outside by an enamel paint preferably opulin green / smoke gray. 15 Nos. of holes each of ¼" shall be made both in the bottom sheet and on any one side sheet of the sorting table and these holes shall be spread in equal distance on complete surface of these sheets for better air circulation and preventing sorting table getting heated.
6. The fluorescent lamp holding plate (ply wood of 12 mm thickness painted white) to hold 4 fluorescent tubes of 40 watts with complete set of standard make (Mysore lamps, GEC, Philips, Crompton greaves) at equal pitch shall be placed at a distance of 210 mm from the top of the table. The entire tubes holding plank shall be of sliding type for easy maintenance (Figures 19 and 20).
7. The sliding ply wood should be placed on a 25 mm M.S. angle welded to the inner side legs of the table (length wise) at a distance of 222 mm from the top of the table (as per drawing- Figures 19&20).
8. Internal electrical wiring without affecting the sliding of the fluorescent lamps shall be provided with on/off switch. A flat type DP switch 30 A shall be provided facing outside for on / off with 5 meters of 3 core wire. Also a 15 A multi socket shall be provided with 15 A top at inner side of the table. For safety purpose ELCB 230 Volts, 16 Amps two pole shall be provided to the main circuit of sorting table.

Safety measures should be provided, wherever necessary to avoid electrical shocks or accidents during the operation.

II. GLASS:
Milky glass having a dimension of 555mm width x 1355mm length x 6mm thickness shall be provided. The glass shall be placed on a rubber beeding fixed on the ridge / wooden frame.

III. COCOON HOPPER:
Cocoon hopper having dimensions of 600mm length x 600 mm width x 200 mm height made of 18 gauge M.S. sheet shall be mounted on the main frame of the table by using suitable brackets. The hopper shall
have a gradient of 100 mm. The hopper shall be powder coated to have smooth surface (Figures 6 and 7).

IV. SORTED COCOON COLLECTOR:
1. The guide for the sorted cocoon collector shall be made of 18 G M.S. sheet powder coated as per the figure with 60 mm slanting.
2. Two numbers of cocoon collection crates made of plastic weighing minimum 3 Kg having size of 400 mm width X 600 mm length X 420 mm height.
SPECIFICATIONS FOR CSTRI CIRCULAR PRESSURISED COOKING MACHINE

i. Main cooking chamber shall be made of 2.5 mm thick stainless steel sheet of size 915 mm diameter and 480 mm height with a dome shaped stainless steel cover having depth of 100 mm. Stainless steel flange is provided for the bottom chamber and the top lid for perfect seating (Figures 8 and 9).

ii. 3 mm thick stainless steel lid shall be provided with a hinge for easy opening and closing of a chamber (top lid) using dead weight and steel rope arrangement through pulley mounted on 1 ½” x 1 ½” x ¼” L angle assembled with top fixed flange of chamber and bottom chamber sheeting angle frame using ½” bolts with gusset. The pulley is made out of cast iron / MS of diameter 2” with suitable groove for wire rope and is mounted using ½” axle support to move freely. The opening of the lid should be limited to 55 ~60° angle with reference to top flange of the cooking chamber and should be locked. The dead weight shall be about 25 Kg and will be operated using wire ropes and clamps (Figures 8 and 9). Or easy opening and closing of lid (top cover) can also be made using suitable dead weight fitted on two levers fixed to the top lid.

iii. The entire chamber shall be mounted on a 50 mm X 6 mm M.S. angle circular frame supported on a ISMC 75 MS channel (Figure 10).

iv. Cooking chamber shall be fitted with steam and cold-water connections with inlets at two places. One water inlet at the bottom of chamber for filling the water and other at the topside of the chamber for sprinkling the water. One steam inlet at bottom of chamber for heating the water and other at top for steaming the cocoons.

v. Perforated stainless steel of 13 mm diameter, 18 gauge tubes for water supply and Stainless steel tubes of size 12 mm diameter, 16 gauge for steam supply shall be provided inside the cooking chamber. The SS tube provided for steam supply at the bottom of cooking chamber shall have 2 spirals / square type for uniform steam supply and shall be of dismantling type for cleaning. Gunmetal gate valve and ball valves with stainless steel working parts fitted shall be of B.I.S. Standard for steam line connections and gate valves of ISI – make for 3 water connections. All the steam lines and connected fittings shall be of MS to resist 35 Kg/ cm² (i.e. 500lb/inch²) hydraulic test pressure.

vi. The holes on the steam pipes shall be facing the body of the chamber so that the steam will not hit the cocoons directly; where as holes in the water pipe at the top shall be at an angle of 45°.

vii. Cooking chamber shall be fitted (outside) with gauge glass for reading water level and one dial thermometer for measuring water temperature. The lid shall be fitted with one pressure gauge, which can read from 0 to 1 kg/ cm², one dial thermometer and 1” steam outlet valve. Suitable safety valve of size 1/2” shall be provided at the top of the doom of the cooking machine.

viii. 40 mm x 12 mm asbestos gasket or Silicon rubber of 12mm shall be fitted to the bottom chamber on the flange/in the groove in the flange.
in the case of silicon rubber) i.e. between the chamber and lid. In the
case of asbestos gasket, it shall be fitted on the flange with counter
sunk brass or stainless steel screws of M 6 size. Care shall be taken
to avoid leakage of steam.

ix. Triangular perforated stainless steel cocoon cooking baskets shall be
made out of 20-gauge stainless steel sheet in the triangular shape of
size 265 mm X 145 mm with smooth finishing. Each basket should hold
about 300 cocoons (Figure 11).

x. 12 numbers of cooking baskets shall be mounted on a stainless steel
circular cage fitted with a suitable lifting mechanism. Another set of 12
Nos. cocoon-holding baskets shall be provided along with the machine.

xi. The central Stainless Steel pipe/shaft of 30 mm diameter and (wall)
thickness of 3mm (in the case of pipe) or stainless steel 25mm rod for
lifting mechanism for circular cage shall be provided. The pipe/shaft is
placed in centre of two colour bushes made to Figures 12 to 15 to
avoid water leakage and to reduce friction between moving shafts. The
leakage with the bottom colour and the shaft will be avoided by
providing rubber hot water resistant seals. The pipe/shaft is lifted up or
lowered down with link mechanism and operating arm.

xii. Cocoon baskets holding cage stand shall have 2 Nos. semicircular
covers fitted with 2 Nos. 100 mm stainless steel hinges with perfect
locking arrangement (Figures 16 and 17).

xiii. The positioning of the gauge glass, water inlet, water outlet, dial
thermometer and lifting mechanism shall be provided at the front side
of the cooking machine for easy operation.

xiv. The bottom and top chamber flanges shall be made out of stainless
steel flat of size 50 mm x 12 mm welded to the main cooking chambers
and to the top dome (lid) with reinforcement at 6 places and surfaces
machined.

xv. The over flow of the water from the cooking vessel shall be properly
adjusted so that when the cages are brought down, the cocoons shall
be fully immersed in the water (i.e. water level above the cage shall be
40 mm), whereas, when the cocoon cages are lifted up above the
water level, the gap between the water level and bottom surface of the
cocoon cages shall be 50 mm above the water level.
Fig. 8

FRONT VIEW OF PRESSUURED COOKING SYSTEM
<table>
<thead>
<tr>
<th>PARTS OF PRESSURIZED COOKING SYSTEM</th>
</tr>
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<tbody>
<tr>
<td><strong>DETAILS OF PARTS</strong></td>
</tr>
<tr>
<td>1. WATER SUPPLY</td>
</tr>
<tr>
<td>2. STEAM SUPPLY</td>
</tr>
<tr>
<td>3. WATER GAUGE</td>
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<tr>
<td>4. TOP LID</td>
</tr>
<tr>
<td>5. OPERATING LEVER</td>
</tr>
<tr>
<td>6. DRAIN</td>
</tr>
<tr>
<td>7. OPERATING HANDLE</td>
</tr>
<tr>
<td>8. BOTTOM FRAME</td>
</tr>
<tr>
<td>9. ANGLE SUPPORT</td>
</tr>
<tr>
<td>10. WIRE ROPE</td>
</tr>
<tr>
<td>11. PULLEY</td>
</tr>
<tr>
<td>12. HINGES</td>
</tr>
<tr>
<td>13. DEAD WEIGHT</td>
</tr>
<tr>
<td>14. AIR VENT</td>
</tr>
<tr>
<td>15. STEAM RELEASE VALVE</td>
</tr>
<tr>
<td>16. SAFETY VALVE</td>
</tr>
<tr>
<td>17. PRESSURE GAUGE</td>
</tr>
<tr>
<td>18. LID LOCK</td>
</tr>
<tr>
<td>19. WATER SUPPLY</td>
</tr>
<tr>
<td>20. STEAM SUPPLY</td>
</tr>
<tr>
<td>21. STEAM SUPPLY BOTTOM</td>
</tr>
<tr>
<td>22. RUBBER GASKET</td>
</tr>
<tr>
<td>23. BOTTOM PLATE</td>
</tr>
<tr>
<td>24. BASKET WITH COCOON CAGE</td>
</tr>
</tbody>
</table>
Fig. 11
Fig. 12

All dimensions in mm.
Fig. 13

'C' 155 PIPE

Fig. 26

CSTRI
CENTRAL SILK BOARD
BANGALORE - 560068

All dimensions in mm.
Fig. 14

STAINLESS STEEL SOLID/HOLLOW SHEET

ALL EDGES CHAMFERED

GROUND TO SMOOTH FINISH

Φ 0.5 THRU HOLE

Φ 2.0
Fig. 15

ALL MADE OUT OF STAINLESS STEEL

TUBULAR FLANGE SUPPORT FOR BASKET LIFTING

C.S.T.R.I., CENTRAL SILK BOARD
BTM LAYOUT, MADIVALA
BANGALORE - 560 068

All dimensions in mm.
Fig. 16
SPECIFICATIONS FOR CSTRI VACUUM PERMEATION COCOON COOKING EQUIPMENT

i. VACUUM TANK:
   a) The chamber shall be made of 2.5 mm thick stainless steel sheet.
   b) Flanges shall be made of 22 mm X 22 mm stainless steel flange. The bottom chamber flange shall have a groove of
   c) 10mm radius groove and inner diameter 450mm
   d) The top portion tank shall be of 500 mm height X 750mm diameter with a inner perforated S. S plate of 5.00 mm thickness and 750mm diameter with a sliding opening arrangement of 300mm diameter and locking arrangement (as per the drawing position may be placed). This inner perforated S.S plate shall be fixed to vacuum tank very firmly using L clamps (fixed to tank) and screw nuts at 10 to 12 places (Figure 18 and 19).
   e) Permeation chamber bottom portion cone shall be made of 2.5mm stainless steel sheet along with stainless steel flanges with gasket and SS lid and locking arrangement (as per the drawing in Figure 18 and 19).
   f) The tank shall be mounted on four legs made of SS sheet channel welded to the tank. The height of the leg shall be 1200 mm (as per the drawing).
   g) Vacuum Tank shall be fitted with gauge glass for reading water level and one dial thermometer (preferably 2"dia) of capacity 0°C to 100°C for measuring water temperature.

ii. WATER:
   a) Inlet collar for water inlet and 1” SS Ball valve for controlling the water flow shall be provided at the bottom cone portion of the tank.
   b) For water outlet another 1” SS ball valve for drain to be provided this is connected to inlet value.

iii. LID
   a) The top lid shall be made of 10 mm thick stainless steel sheet having 500mm diameter and attached with hinges and inter connected with counter balancing dead weight. The rings scatting shall be machined to avoid leakage (Figure 18 and 19).
   b) The opening of the lid shall be supported by 40mm X 40 mm angle.
   c) A rubber gasket shall be used with dimensions of 10 mm round rubber without any air leakage.
   d) The chamber shall be fitted with a vacuum gauge 75 mm diameter, 0 ~ 700 mm Hg and a brass / Stainless steel air inlet 1”ball valve shall be provided on the side top of the chamber.

iv. VACUUM PUMP:
   a) Direct drive rotary water ring vacuum pump / Oil vacuum pump with ½ HP, 3-phase motor having air displacing capacity 200 litters per minute and negative pressure of 600 mm Hg shall be provided.
   b) Permeation chamber and vacuum pump shall be inter connected by 25mm (1") Nylon braided hose pipe with air expansion chamber of size 200 mm diameter and 458mm height with inlet collar and outlet brass
wheel valve or 13mm stainless steel ball valve. A non return value has to be fitted in between chamber and vacuum pump (as per diagram).

All the inlet and outlet pipe fittings shall have inside perforated mesh fittings to avoid cocoon entering to the pipes.
All the nuts and bolts shall be made of SS material for the permeation chamber.

5. COCOON COLLECTION TANK: Water permeated cocoons collection tank shall be of SS material of 18 gauge having dimensions of 450 mm Width X 600 mm Length X 450 mm Height having 4 wheels trolley type. Two number of cocoon collection tanks shall be provided.

6. WATER CIRCULATION TANK: The water circulation tank shall be of stainless steel material of 18 gauge having dimension of 650 mm x 650 mm x 650 mm with SS cover to close the tank. The tank shall have dial thermometer to indicate the water temperature and steam connection with ½” ball value to heat the water with suitable S.S. perforated pipe fittings at the bottom of the tank. The tank shall also have drain out arrangement with 1” ball value. Vacuum Tank shall be connected with the water circulation tank with the help of suitable quality pipe.

Fig. 18
SPECIFICATIONS FOR CSTRI TWO PAN EQUIPMENT FOR BRUSHING

i. **Brushing equipment stand:**
M.S. 1 ½” x ¼” angle fabricated frame, measuring 32” length, 20” width and 30” height (Figures 20 and 21). Stainless steel 20 gauge tray fitted to the above stand.

ii. **Cooking vessels:**
Two number stainless steel (outer) vessels 10” diameter x 10” depth shall be fitted to the S.S. tray (Figure 20 and 21). Each cooking vessel shall be provided with 9 1/2” diameter x 8” depth inner perforated vessel (Figure 23).
SS cooking ladle five nos. and Cocoon pressing perforated plate / disc (as per the Figure 23) five nos. shall be provided.

III. **Steam and Water pipes:**
1. Each cooking vessel shall be suitably connected with ½” “C” class ERW (MS) steam pipe with G.M. ball valves, all working parts shall be made of stainless steel. **All steam pipe lines and connected fittings shall resist 35Kg/cm² (500 lb / inch²) hydraulic test pressure.** Perforated ½” 20 gauge copper tube shall be provided for steam supply to the cooking vessel.
2. ½” steel tap fitted with 1” GI pipe shall be provided for supply of water to the cooking vessel (as shown in Figure 21 and 22).
3. Each cooking vessel shall be provided with 1. G.M. main cock to drain out water.

IV. **Paint:**
1. Enamel paint shall be neatly painted on primary paint.
2. All bolts, nuts and washers shall be of MS galvanized / plated.
TWO PAN COOKING SYSTEM

Fig. 20
Fig. 21
COCOON PRESSING DISC.

- **Wooden Handle**: 1" diameter
- **Lock Here With Nail**
- **Brazed**
- **6.5" Tube**: 0.8 mm thick, 6" long
- **1/4" Hole**: Folded to top to avoid sharp corners

**Perforated**
- **Hole**: 1/4" x 3/4" pitch
- All surfaces should be free from burrs or sharp corners

**Material**: SS304

<table>
<thead>
<tr>
<th>QTY</th>
<th>1 NO.</th>
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Central Silk Board
Bangalore-68

Cocoon Pressing Disc

Fig. 23
i. FRAME:
   a) Cast iron frame made of k-20 material, Bottom frame, Centre frame, and Top frame with two side brackets weighing minimum 60 to 63 Kg, machined wherever necessary.
   b) Each of the frame to its length is tied up with 16 mm MS rod, 3 numbers, (Two bottom and one top).

ii. MOTOR AND DRIVE ARRANGEMENT:
   a) 1 H.P. 960 rpm, 380 / 440 volts 3phase, 50 cycles induction motor shall be provided as per BIS specifications. The motor shall be from ISO certified companies.
   b) The drive arrangement shall be covered by 20gauge M.S. sheet with locking system.

iii. MAIN SHAFT:
   a) 25mm main bright shaft fitted with self-aligning sealed type pillow block ball bearings.

iv. TRANSMISSION MECHANISM:
   a) Fitted with V belt B section (ISI mark) chain & M.S. sprockets, EN-8 metal helical gear, CI gear and Nylon gears. The gears should be hobbled and hardened wherever necessary to minimize wear and sound.
   b) All moving parts in the machine such as gears, ‘V’ pulleys shall be tightened by high tensile fasteners of standard make.

v. REELING BASINS:
   a) 10 reeling ends shall be accommodated in each basin and distance between ends (between the jetteboutte centres) shall be 105 mm.
   b) Made of Salem stainless steel, 304 grade with inner dimensions measuring length 42”, width 15” & height 4” weighing minimum 6 Kg, with water holding capacity of 42 litres. The 3 sides of the basin are 20 mm square fold finished.
   c) Basin over flowing water arrangement connected with brass or Nylon nipples.
   d) Reeling basins with four partitions for the working convenience made of stainless steel.
   e) Each basin fitted with two stainless steel vessels (Bowl) for keeping silk waste and basin refuse.
   f) The S.S Reeling basin is positioned over the bottom frame using 1 ½” X ¼” M.S. Angle.
   g) From the top, reeling basin is positioned at a height at 32” from floor level.
   h) Drain out nut of 25 mm size made of polypropylene or nylon material shall be provided for each basin.

vi. STEAM PIPES:
   a) Steam inlet is fitted with 1” M.S. pipe with 1” IBR steam valve with SS working parts and all the steam pipe lines and connected fittings should resist 35Kg/cm² (500lb/inch²) hydraulic test pressure.
   b) Steam pressure gauge 0 – 7 kg/cm² capacity is provided with siphon pipe.
c) 1 ¼” “C” class M.S. pipe for steam line with 3/8” or 1/2” S.S.
Ball Valve, interconnected with 3/8” X 20G copper pipe, Brass
flair union and M.S. Fittings with perforations 3/8” 20 gauge
copper tube for providing steam to reeling basin. The copper
steam pipe shall be tapered towards end and have 3 mm diameter
holes. The holes shall be at the side of the steam pipes. All the
steam pipe lines and connected fittings should resist 35 Kg/cm²
(500lb/inch²) hydraulic test pressure.

d) For draining out the condensed water, ½” IBR wheel value with
M.S fittings provided at the end of the machine. All the steam
pipe lines and connected fittings should resist 35 Kg/cm²
(500lb/inch²) hydraulic test pressure.

vii. WATER PIPES:
a) Water inlet pipe shall be fitted with 1” G I pipe along 1” G.M.
plug cock.
b) 1 ¼” “C” class G.I. Pipe for water line, with 3/8” or ½” S.S. ball
valve interconnected with 3/8” X 20 G copper pipe and brass
flair union with G.I. Fittings fitted on basin tray.
c) Steam & water pipes are fitted 1 foot over basin tray, to avoid
corrosion.

viii. BUTTON AND BUTTON CLIP:
a) Good quality ceramic reeling buttons (100 Nos.) shall be supplied
along with reeling machine. Brass or S.S button clip mounted on
brass or SS L Clamp flexible in motion to avoid breakage of yarn
due to interruptions by slugs in reeling.

ix. JETTEBOUTE ASSEMBLY:
a) 10 numbers of jetteboutes shall be fitted in a panel made with 18-
gauge stainless steel structure weighing minimum 1.9 kg and
brass / Nylon bushes for holding the Jetteboute axel tightened
with 5 mm S.S. Screws and distance between jetteboutes’
centre shall be 105mm.
b) Jetteboute two wings type made of Nylon-6 material fitted with
stainless steel axel of 8 mm bore – (7 – 8 mm diameter bore) with
its bottom & top position, outer and inner end chamfered and
polished.
c) Jockey pulley – 32 mm 7 Nos., 50 mm – 1 No., fitted with brass
bolt & nut and nylon or stainless steel flat.
d) Driven by polyurethane 5 mm round belt.
e) Clutch type engage and disengage arrangement fitted in a C.I
gear box, comprising, EN-8 axel, ball-bearings 2 numbers, EN-8
helical/bevel gears and 4” V pulleys made of Gun metal/Derlin /
Norzile.
f) Jetteboutte revolution 700 to 800 RPM. Jetteboute speed should
be de-linked from the reel speed.
g) Jetteboute mounted panel should not vibrate during reeling
operation.

x. REELS AND DRIVE MECHANISM:
a) Reel made of Nylon 6 material shall be of 100 mm in breadth, 670 mm to 680 mm in circumference with 10 or 12 ribs weighing 500 – 600 grams. 10 reels on basin, 10 reels as spare, (20 reels for each basin).

b) Reel stand with 5/8” M.S. Rod fitted on MS base to keep 10 spare reels with spring and bottom portion machined.

c) Auto individual reel stop device model A/B made of Nylon-6 material to prevent breakage of silk yarn while reeling.

MODEL A: Automatic reel stop motion consists of Nylon 6 long arm with MS bracket and magnetic stop. The rubber bush at the back fitted for stopping the reel and easy reverse rotation of reels for knotting.

MODEL B: Automatic reel stop motion device consists of MS bracket powder coated with Nylon 6 / SS long arm and levers. The rubber bush at the back fitted for stopping the reel and easy reverse rotation of reels for knotting.

d) S.S. Reel shaft 32mm O.D. Hollow shaft or 25mm solid, 12 mm ~ 15 mm sealed ball bearings fitted on both ends with Nylon gears, locked with G.M. cone nut.

e) Driving device for reel bar, with clutch type engage and disengage movement fitted in a C.I. gear box comprising EN-8 axel ball bearings 2 Nos., M.S. sprocket gears Cl / Nylon gears with phosperous bronze bush driven by chain.

f) For housing the reel bar, self-locking system shall be provided in the reel gear box.

g) Reel top, bottom and back covered by minimum 24 gauge M.S. sheet.

h) Nylon reel button, spring and the groove made on the reel shaft should be smooth and free from friction.

i) Two lines of steam pipe ERW (MS) 1¼” diameter “C” class shall be provided throughout the length of the machine positioning below and above at back side of the small reels for drying the silk and for draining out the condensed water, ½” steam trap and ½”IBR wheel valve with M.S. fittings shall be provided for this steam pipe line at the end of the machine. All the steam line pipes and connected fittings should resist 35Kg/cm² (500lb/inch²) hydraulic test pressure.

xi. VARIABLE SPEED MECHANISM:

a) Step pulley mechanism to drive the reels at three different reeling speeds viz., 175 rpm, 200 rpm and 225 rpm shall be provided.

xii. DISTRIBUTION MECHANISM:

a) Mounting of silk on reels is 2 ½” wide in convex shape. Speed ratio of reel is 1.5:1.

xiii. TRAVERSE MECHANISM:

a) Planetary type gear system comprising C.I body EN-8 axel, ball bearings and EN-8 helical gears, 2.5 modules hobbled of 14/15 or 18/19 teeth shall be provided.

b) Self-aligning connecting bearing shall be fitted to the traverse.

c) Channel shall be made of 24 G S.S sheet.
d) Improved porcelain/ceramic thread guide with SS wire hook shall be fitted with screw fitting.
e) Nylon rollers embedded with ball bearings, Nylon guides for each frame (on both sides), Connecting flat made of SS 10 gauge shall be provided for horizontal motion of the S.S traverse flat.

xiv. THREAD GUIDE PULLELY (PLASTIC CROISSURE PULLEYS):
   a) Plastic Croissure pulleys fitted on plated M.S. Metal strip with separate plastic covers on two sides shall be provided.
b) 4 mm brass stud shall be fixed on both sides of bobbin.
c) Bobbin and covers shall be made of polystyrene.
d) Bobbin axel shall be made of silver steel (hardened) material.
e) For each end, 4 numbers of plastic Croissure pulleys shall be provided.

xv. ELECTRICAL CONTROL PANEL:
Suitable starter with relay system shall be provided for one HP motor.

16. PAINT:
a) The entire machine shall be painted with primary paint. Then the machine shall be neatly spray painted by suitable enamel colours.
b) Chromium plated and yellow passivated material is used to avoid corrosion wherever necessary.
c) All bolts, nuts and washers should be electro plated.

The description stated above shall be incorporated on the said machine only. Civil works, steam pipes, water pipes and electrical connections from the main supply up to the machine are not included.

SPARES FOR MULTIEND SILK REELING MACHINE 6 BASINS

CAPACITY

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Items</th>
<th>Quantity in Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Nylon Button clip set</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Ceramic/ porcelain Button</td>
<td>60</td>
</tr>
<tr>
<td>3.</td>
<td>Plastic Croissure pulley</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Jetteboutte set with axel</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>1 3/8” jockey pulley set</td>
<td>10</td>
</tr>
<tr>
<td>6.</td>
<td>2 ¾” jockey pulley set</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>5mm diameter P.U Jetteboutte Belts (meters)</td>
<td>9</td>
</tr>
<tr>
<td>8.</td>
<td>Reel Bar Nylon Gear</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>Nylon Reels</td>
<td>10</td>
</tr>
<tr>
<td>11.</td>
<td>Reel Break Nylon/ S S arm</td>
<td>6</td>
</tr>
<tr>
<td>12.</td>
<td>1” Rubber for Brake</td>
<td>20</td>
</tr>
<tr>
<td>13.</td>
<td>Plastic Drain cock</td>
<td>4</td>
</tr>
</tbody>
</table>
ONE SET OF TOOLS FOR SILK REELING MACHINERY MAINTENANCE

1. One set of set spanner (approximate) -- 14 Nos.
2. 12” Screw spanner ---- 1 No.
3. Holland key set (spanner) (approximate) ---- 1 set
4. 18” Pipe wrench -- 1 No. Each
5. 8” Cutting pliers -- 1 No.
6. 6” Nose Pliers -- 1 No.
7. Screw Driver one set of 10”-8”-6” -- 1 set of 3 Nos.
8. Hammer 0.5 kg. -- 1 No.
9. Oil can 250ml size -- 1 No.
10. Grease Gun 1/2kg. -- 1 No.
11. Croissure pulley cleaning knife -- 1 No
12. Jetteboute pulley cleaning knife -- 1 No

SPECIFICATIONS OF CSTRI SILK RE-REELING MACHINE

The main specifications of the silk re-reeling machine shall be as follows:

FRAME:

a) The bottom frame of the re-reeling machine shall be made from 16-gauge 40 mm square M.S. Tubes, Flats etc.
b) The top frame shall be fabricated by 16 gauge 25 mm square M.S. Tubes, Flats etc.,
c) Height of reel axel from the floor shall be 980 mm.

BODY STRUCTURE:

a) The reel shall be covered with 20 gauge M.S sheet covering all sides, top and bottom. Inside of the re-reeling machine to be insulated with 1 mm CAF Gasket sheet for insulation (sides and bottom). At the bottom of the frame 24 gauge stainless steel sheet (strengthened with M.S Flat strips on the inside) shall be used to cover the legs of the re-reeling machine completely.
b) Tilting spherical transparent windows shall be made of 2.5 mm acrylic sheet cover, fabricated on M.S. or FRP moulded flat structure, fitted above each reel with rubber bush stoppers at rear end to avoid loss of temperature.
c) 40mm x 14 G M.S. Sq. pipe guard shall be provided at the end of the machine for safety purpose.

HUMIDITY EXHAUSTERS:

a) The humidity vent shall be provided to each window of re-reeling machine.

MOUNTING OF THE MACHINES:

a. The entire silk re-reeling machine shall be mounted on 75mm X 40mm X 6mm, M.S. Channels.
b. Base for small reels keeping shall be made with cement platform in such a way that small reels can be placed at an inclination to the central axis of balloon control rings so that silk can be unwound smoothly.

MOTOR AND DRIVE ARRANGEMENT:
a. The Drive arrangement structure shall be fabricated by 50 X 50, 6mm M.S. Angle and suitably covered by 20 gauge M.S. Sheet.

b. 1 H.P 960 RPM, 380 / 440 volts, 3 phase, 50 cycles induction Motor preferably from ISO 9000 certified companies shall be provided with the machine.

c. The motor shall be provided with DOL (Direct on line) starter.

v. **TRANSMISSION:**
   a) Fitted with V belt, 5/8” pitch chain, M.S. Sprocket, with 3 module 50 Teeth (156 mm diameter) M.S. Gears, EN-8 Metal shaft fitted with 25 mm pillow block bearing.
   b) All moving parts in the machine such as gears, ‘V’ pulleys are tightened by high tensile fasteners.

vi. **MAIN SHAFT:**
    The main shaft shall be of 25 mm diameter M.S. bright rod with self aligned pillow block bearings. The drive is transferred through 480mm diameter, 25 mm width, and cast iron drum wheel.

vii. **REELS:**
    a) The reels shall be of 1.5 meter in circumference, which shall be fixed on 6 way LM6 Aluminium material hubs having 12mm 4 fixed spokes and 2 collapsible spokes with brass wing nuts. The re-reeling aluminium hubs shall be fixed on central shaft groove using bolt arrangement. The collapsible spokes shall be 12 mm diameter. The brass wing nut shall have 25 mm thread length. The reel shall weigh a minimum 11 Kg.
    b) The wooden battens shall be made of good quality seasoned teak wood smoothly polished of size 50 X 25 X 600 mm with single groove in the middle of the batten of size 4 mm square.
    c) The reel shaft shall be made of M.S. 20 mm diameter fitted with both sides sealed ball bearings of 15 mm inner diameter on both sides of the shaft. The bearings shall be fitted on open type cast iron housings on left side and self aligned U block on the right side.
    d) Friction wheel shall be of 150 mm diameter and 25 mm width made of compressed hard wood/Nylon / rubber band with C.I. Flange with hub fastened with M6 bolts and nuts.

viii. **TRAVERSE:**
    a. The Traverse bevel gear shall be made of nylon – 6 material having 16 T X 25 T of 3 modules.
    b. The thread distribution shall be connected with 100 mm disk to achieve eccentric drive and provided with curved shape traverse connecting rod using 6mm M.S. round/flat rod at edges bushed. The traverse pipe shall be welded and drives to avoid wobbling. The traverse pipe shall be of size 12/20 mm 24 gauge square stainless steel tube mounted on 2 sets of nylon square bushes /nylon rollers and having 5 ends / window. The distance between guide to guide is 115 ±2 mm. The weight of the distribution pipe with thread guides shall be 400 g.
    c. Pigtail type thread guides of enamel coated - single spiral having smooth finish shall be fixed in the vertical position and the thread shall pass on stainless steel tension tube of 24-gauge 15 mm diameter. Use of 3 mm diameter stainless steel wire for double spiral thread guide is preferred.
d. Balloon control rings shall be fixed on flat frame or side sheet and shall be made from 5 mm thickness stainless steel wire having 35 mm inner diameter and length of 5.25” (3 numbers) & 4.25” (2 numbers).

e. 16 mm X 24 G, stainless steel pipe used for yarn path.

ix. **REEL SPEED VARYING DEVICE:**

The machine shall be provided with step pulley arrangement to enable to run the machine at three different speeds viz., 150 rpm, 180 rpm and 210 rpm.

11. **REEL BRAKE:**

The brake wheel shall be fixed on reel shaft. The U shape brake shoe fitted on long lever and loaded with effective springs at the rear end to achieve the following objectives:

a) The reel shall come to a halt with minimum rotations and should not rotate backwards.

b) The engaging and disengaging drive shall be very effective.

12. **STEAM PIPES FOR CIRCULATION OF HOT AIR:**

a) 5 rows of steam pipe lines to be drawn shall be of 40 mm dia ‘B’ class MS pipe, one between the 2 reels, one each at the top & bottom and each side of the reels. Out of the five rows, two rows of the steam pipes shall be of fin tube type of 20mm diameter B Class, which will be placed at the bottom of the reels.

b) The main steam header pipe shall be of 90mm diameter and the condensed water drain of 50 mm diameter with float type steam trap shall be provided for smooth and equal distribution of steam in all five steam pipes. 50 mm MS flange shall be provided for maintaining steam trap along with blow off cock.

c) Steam pressure gauge of 4 inches diameter, capacity 0 ~ 7 kg per cm$^2$ with siphon pipe shall be fitted on the steam header.

d) All the steam pipes and connected fittings shall be of MS to resist 35 kg/cm$^2$ (500 lb/inch$^2$) hydraulic test pressure.

13. **ELECTRICAL CONTROL:**

Suitable starter with relay system for one HP motor shall be provided.

14. **PAINT:**

1. The entire machine shall be painted with primary paint. Then the machine shall be neatly spray painted by suitable enamel paint.

2. Primary black dull paint shall be neatly sprayed inside the re-reeling machine.

3. Yellow passivity material is used to avoid corrosion.

4. All bolts, nuts and washers are electro plated.

5. Steam pipes shall be painted with heat resistant aluminium paints.

The description stated above shall be incorporated on the said machine only. Civil works, steam pipes, water pipes and electrical connections from the main supply up to the machine are not included.
### SPARES FOR 6 WINDOW AND 6 WINDOW SILK RE-REELING MACHINE

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Items</th>
<th>Quantity in Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5mm Ring Hooks</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Traverse distributor Nylon square bush /Nylon roller</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Thread guide hooks</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>Traverse connecting set</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Nylon Traverse Bevel gear set</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Teak wood Battens</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Friction wheel</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Brake, Nylon Disc</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Skeining equipment with SS pipe</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Specifications / hydraulic test pressure of all the steam pipes and connected fittings provided in the Two pan unit for cooking /brushing, Pressurised cooking machine, Reeling machine and Re- reeling machine etc. and in the unit has been given assuming that unit is of 6-basin (60 ends) capacity and that Boiler to be used in the unit is of 100 Kg steam output per hour and steam working pressure of 3.5 Kg /cm².
SPECIFICATIONS FOR CSTRI REEL PERMEATION CHAMBER

a. VACUUM TANK:
   a) The chamber shall be made of 2.5 mm thick stainless steel sheet.
   b) Flanges shall be made of 50 X 12 mm thickness stainless steel flat or
      25mm X 25mm stainless steel flange. The bottom chamber flange shall
      have a groove of 25 mm width X 6mm depth or 12mm radius groove.
   c) Reel permeation chamber bottom portion plate shall be made of 3mm
      stainless steel sheet along with 25mm X 6mm stainless steel angle
      reinforcement.
   d) The tank shall be of 625mm height X 750mm diameter to hold 20 reels
      per batch.

b. WATER:
   a) 13 mm (1/2”) collar for water inlet and 13 mm SS Ball valve for
      controlling the water flow shall be provided.
   b) Capacity of water tank shall be about 260 litres
   c) 13mm (1/2”) stainless steel ball valve for draining out water at the
      bottom of the tank shall be provided.

c. LID
   a) The top lid shall be made of 3mm thick stainless steel sheet and attached
      with a ring made of 50mm X 12 mm stainless steel flat (machined) or
      25mm x 25mm SS flange. The depth of the lid curvature shall be
      minimum 75mm (3”). The rings seating shall be machined to avoid air
      leakage.
   b) The opening of the lid shall be supported by 50mm X 12 mm SS flat.
   c) A rubber gasket shall be used with dimensions of 25mm width and 12
      mm thickness or ½” round rubber.
   d) The chamber shall be fitted with a vacuum gauge 50mm diameter, 0 ~
      700 mm Hg and a brass / Stainless steel air inlet ball value of ½ “ or 1”
      valve.

d. VACUUM PUMP:
   c) Direct drive rotary water ring vacuum pump / Oil vacuum pump /
      diaphram vacuum pump with ½ HP, 3-phase motor having air displacing
      capacity 100/150 litres per minute and negative pressure of 500 mm Hg
      (20 psi) shall be provided.
   d) Permeation chamber and vacuum pump shall be inter connected by
      13mm (1/2”) braided hose pipe with air expansion chamber of size
      100mm diameter and 458mm height with inlet collar and outlet brass
      wheel valve or 13mm stainless steel ball valve.

e. REEL IMMERSION STAND:
   a) 4 Nos. Stainless steel stands to accommodate 5 reels each shall be
      provided for immersing reels in reel permeation chamber with
      aluminum base plate.
SPECIFICATIONS FOR TESTING APPLIANCES

**Epprouvette**
Hand operated - Metallic Epprouvette with Analogue / Digital revolution counter to measure up to an accuracy of 1 meter. Circumference of reel is 1.125 meters. Fitted over metal base.

**Electronic Balance:**
Electronic balance shall be of 500gms / 600 g capacity With 0.01 g sensitivity.

**POWER GENERATOR**
7.5 KVA capacity generator having ISI-mark and manufactured by reputed manufacturer shall be supplied for 6-basin capacity Multiend reeling machinery package.