



सीएसआईआर-केंद्रीय खाद्य प्रौद्योगिक अनुसंधान संस्थान  
CSIR- CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE  
मैसूरु / MYSURU-570 020, भारत / INDIA

(Constituent Laboratory of CSIR, New Delhi (Ministry of Science & Technology)  
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**Tender Ref: CFTRI/74177/2019 Date: 16-12- 2019**

**Tender ID: 2019\_CSIR\_38270\_1**

The revised final specification based on the discussion in Pre Bid Conference enabling equal opportunity to all OEMs has been incorporated below as revision to the original tender specification. All bidders are requested to peruse the same and submit their bids accordingly on or before 02.00 p.m. on 23/Jan/2020.

**All other tender terms and conditions remain unaltered.**

#### **Revised Technical Specifications for Sorghum/ bajra processing line**

<b>S. No.</b>	<b>Item</b>	<b>Quantity</b>
1	<b>Cleaner</b> Cleaner Vibro / gyro for cleaning sorghum and pearl millet (Bajra). All steel construction cleaner deck capable of handling 1 Ton of sorghum and pearl millet (Bajra) is required for high-quality size separation and aspiration to remove dry material such as leaves, straw, and other foreign materials. 1 set of the following additional sieves should be	1

	<p>provided along with the machine:</p> <ul style="list-style-type: none"> <li>a) Sieve – 0.8 and 1mm</li> <li>b) Sieve – 2.0 and 2.8mm</li> <li>c) Sieve – 3.0 and 3.8mm</li> </ul> <p>The unit should have aspiration system at inlet and outlet points, complete with dust collection/control system with feed hopper adjustable for even distribution of feedstock on screen surface, provision for quick removal and insertion/stretching of screen through quick-release clamps; enclosed type balanced drive system for operation; provision to vary the deck vibration and speed; provision to vary machine conditions while the machine is in operation. The unit should have efficient de-clogging system to prevent choking of screens.</p> <p>The unit should be fitted with appropriate capacity continuous rated TEFC induction motor and starter of reputed make to run on 415V, 50Hz, 3 phase AC supply.</p> <p>Capacity 1ton/h</p>	
2	<p><b>Destoner</b></p> <p>Vibratory destoner vacuum type for continuous destoning of grains. The unit should be of all-steel construction with vibratory deck and well balanced built-in fan. All the vibratory components should be properly balanced.</p> <p>The unit should have facilities for independent alteration of inclination of deck and volume of air. Necessary fitting with feed hopper, regulators for uniform flow of grains across the entire width of deck with all essential accessories and complete with dust collection/control system.</p> <p>The unit should be fitted with suitable continuous rated TEFC induction electric motor and starter of reputed make to run on 415volts, 50Hz, 3 phase AC supply.</p>	1

	Capacity 1ton/h	
3	<p><b>Drawer Magnet Separator system</b></p> <p>Drawer type Magnet (fixed to chutes) is required to remove ferrous contaminants from dry, free-flowing grains. When grains fall down on drawer magnet metal are a clog and other particles go to another section. Generally, it holds and captures ferrous contaminants from flowing food products. They are applied in the cleaning house prior to the milling unit.</p>	<p><b>Number as per the requirement</b> (1unit in each section i.e. Before steaming, polishing, pulverizing and before finished material</p>
4	<p><b>Soaking / Steaming tank with MS structure and steamline</b></p> <p>Steaming tanks 3 to 4 mm body thickness in S.S.304 Construction without cover fitted with suitable steaming pipe/device with fittings and accessories. Strainer Pipe &amp; Discharge Valve in S.S. with holding capacity 1.5ton of sorghum &amp; bajra</p> <p><b>M.S. STRUCTURE:</b> 1 lot</p> <p>The common supporting structure for the above-mentioned soaking/steaming tanks in M.S. construction including Stair Case, ladder, Walkways, Railings and Grating Platform.</p>	2
5	<p><b>Continuous Vibro Fluidized bed dryer</b></p> <p>Continuous Vibratory fluid bed dryers is required for drying of Parboiled/steamed Sorghum/Bajra. The Sorghum/Bajra to be dried is fed on top of perforated sheet (S.S.304) and the hot air operating (air</p>	1

	<p>temperatures 40-80°C) enters from the bottom of the perforated sheet.</p> <p>The fluid bed chambers are to be mounted on springs and fitted with vibratory motors with vibration controller system.</p> <ul style="list-style-type: none"> <li>• The dryer should be equipped with control systems for adjusting vibro fluidization, residence time and product moisture.</li> <li>• Then dryer should assure uniform product temperature</li> <li>• Unit should have proper system for temperature/airflow controls to customize the thermal process and maximize the efficiency of heat/mass transfer, assuring drying and cooling of the product within the best time and temperature range for high-quality output.</li> <li>• Unit should ensure explosion proof designs.</li> <li>• CIP (Cleaning in Place) options should be provided for good sanitation.</li> <li>• All the necessary systems like air heating system (Electrical/diesel//thermic fluid) with efficient heat exchangers, fans, cyclone separators, bag filters and scrubbers should be provided for smooth and efficient functioning of dryer.</li> </ul> <p>The unit should be fitted with suitable continuous rated TEFC induction electric motor and starter of reputed make to run on 415volts, 50Hz, 3 phase AC supply.</p> <p>Capacity - 1ton/h</p>	
6	<b>Screw conveyor / Moisture conditioning unit / Dozing system</b>	2

	<p>Screw conveyor in S.S.304 Construction with the cover fitted with spray system with a set of adjustable mist nozzles for uniform spraying of water and for uniform mixing of sorghum / bajra with water. Control/metering unit to adjust the water flow from water tank (to be supplied - with holding capacity of 500ltr water), Gap between conveyor housing and screw blade should be less than 0.5mm. Geared motor with VFD system to control the conveying/conditioning speed of conveyor, Length &amp; screw Diameter of conveyor should capable of handling 1ton of Sorghum/bajra for 30min of conditioning.</p> <p>The unit should be fitted with suitable continuous rated TEFC induction electric motor with gearbox and starter of reputed make to run on 415volts, 50Hz, 3 phase AC supply.</p>	
7	<p><b>Horizontal Abrasive roll polisher / whitener</b></p> <p>Automatic / semi-automatic abrasive roll polisher for polishing of conditioned sorghum/bajra. The unit should be provided with 3 sets of wear-resistant polishers screen configurations (round hole/slot sizes/ wire mesh of spring steel of 0.8 to 1mm) suited for polishing of sorghum &amp; bajra .</p> <p>The machine should be equipped with proper load systems for adjusting pressure in the milling chamber, aspirator channel, bran collection systems and abrasive roller cooling system.</p> <ul style="list-style-type: none"> <li>• Capacity - 1ton/h</li> </ul> <p>The unit should be fitted with suitable continuous rated TEFC induction electric motor and starter of reputed make to run on 415volts, 50Hz, 3 phase AC supply.</p>	2
8	<p><b>Horizontal channel type emery stone grinder / abrasive disc grinder</b></p> <p>Emery stone grinder / abrasive disc grinder for</p>	4

	<p>grinding of sorghum / Bajra.</p> <p>The machine should be additionally equipped with a vibrating feeder with a control system, aspirator channel and dust collection system.</p> <ul style="list-style-type: none"> <li>• Emery Stone size – Dia. 36”</li> <li>• Varied RPM – with variable frequency drive(VFD) controlled</li> <li>• The unit should be equipped with an automatically controlled gap adjustment system</li> </ul> <p>The unit should be fitted with suitable continuous rated TEFC induction electric motor and starter of reputed make to run on 415volts, 50Hz, 3 phase AC supply.</p>	
9	<p><b>Plansifter</b></p> <p>The plansifter is required for efficient sifting and grading of sorhum/bajra flour/semolina.</p> <p>Automatic machine should be equipped with Self-cleaning rubber balls prevent choking and easy replaceable sieves (additional set of sieves for grading different size of semolina &amp; flour(260micron) and screen tensioning system to be provided).</p> <ul style="list-style-type: none"> <li>• Capacity -1ton/h</li> </ul> <p>The unit should be fitted with suitable continuous rated TEFC induction electric motor and starter of reputed make to run on 415volts, 50Hz, 3 phase AC supply.</p>	1
10	<p><b>Pneumatic Conveying System</b></p> <p>Pneumatic Conveying system is used for vertical conveying of different grades &amp; sizes of Sorghum/Bajra flour in different stages of grinding and sifting. The actual movement of air within the pipelines of the pneumatic transport system to be provided by a high-pressure fan which conveys and elevates the material in the installation.</p> <p>The Pneumatic Conveying System should consist of following:-</p> <p>a. Feeder</p>	As per layout requirement for smooth and continuous running of plant (from 1 <sup>st</sup> stage of pulverization to finished storage tanks)

	<ul style="list-style-type: none"> <li>b. Cyclone</li> <li>c. Airlock</li> <li>d. Transporting Pipe Line</li> <li>e. Pipe Bends</li> <li>f. Clamps</li> <li>g. Rubber connecting joint</li> <li>h. Fastening screws</li> <li>i. Inspection glass</li> <li>j. High pressure fan</li> </ul>	
11	<p><b>Bucket elevator</b></p> <p>In M.S. construction with food grade polymer Buckets, Pulley &amp; Light Weight Polymer Belting, and geared box with motor.</p> <p>The unit should be fitted with appropriate capacity continuous rated TEFC induction motor and starter of reputed make to run on 415V, 50Hz, 3 phase AC supply.</p> <p>Capacity 1-2ton/h(each)</p> <p>This Elevator will feed Raw sorghum/bajra to Bin.</p> <p><b>Delivery pipe in S.S.</b></p>	As per layout requirement for smooth and continuous running of plant
12	<p><b>Storing tanks with MS structure</b></p> <p>Storing tank 3 to 4 mm body thickness in S.S.304 Construction without cover fitted with suitable Discharge Valve with holding capacity of 20min.</p> <p>one for stand-by after polishing used for storing parboiled polished grain during flaking process &amp; one for continuous grinding process, 2nos. storing tanks finished product</p> <p><b>M.S. STRUCTURE:</b> 1 lot</p> <p>Supporting structure in M.S. construction including Stair Case, ladder, Walkways, Railings, and Grating Platform.</p>	4
13	<p><b>Surge bin with MS structure</b></p> <p>Storing tanks 3 to 4 mm body thickness in SS 304/GI Construction without cover fitted with suitable Discharge Valve with required holding capacity 15 to</p>	As per layout requirement for holding of Sorghum /Bajra

	<p>20min.</p> <p><b>M.S. STRUCTURE:</b> 1 lot</p> <p>Supporting structure in M.S. construction including Stair Case, ladder, Walkways, Railings, and Grating Platform wherever required</p>	<p>at different stage during the continuous running of plant</p>
14	<p><b>Central dust collection/discharge system</b></p> <p>System integrated with all dust production points across the mill to collect the dust from bucket elevator/machinery wherever required to keep the entire plant dust-free. The system should be complete with dust blower, collecting system, motor, and cyclone fitted with airlock and bag filters.</p>	1
15	<p><b>Bag filling machine with SS304 hopper/contact parts,</b></p> <p>Semi-Automatic high-speed processor-based electronic weighing system with standard load cells, double speed vibratory feeder and Pneumatically operated functions.</p> <p>Bag material: Cloth/gunny bags</p> <p><b>Range: 5 to 50Kgs</b></p>	1

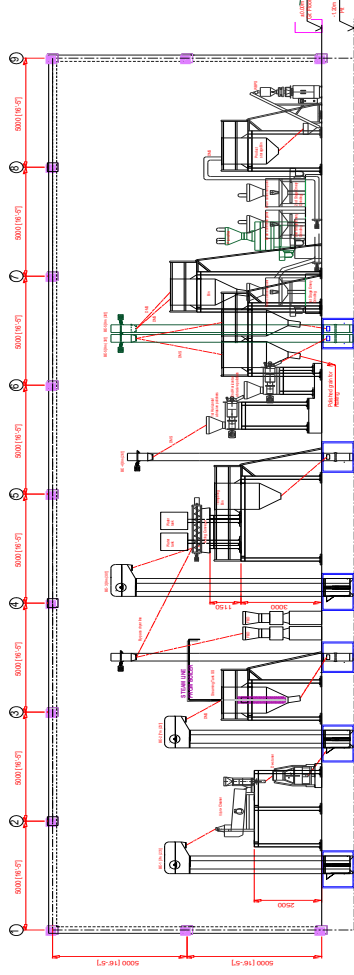
In addition to the detailed specifications of the machinery the following points may also be added as a general item in the specification of machinery for the specific lines:

1. Essential spares of machinery like screens and other spares for smooth functioning of the plant for one year of operation should be supplied.
2. Tools required for maintenance of machinery should be supplied
3. Appropriate guard for all open drives should be provided for safety
4. The individual machinery should be supplied with electrical motor and matching starter

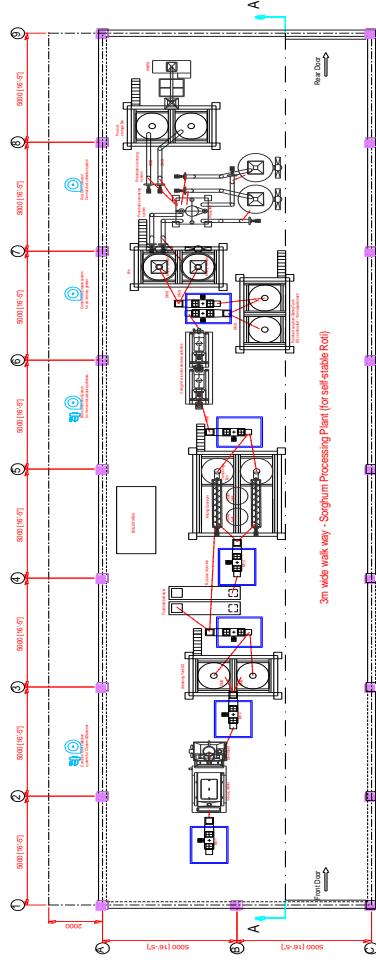


5. Provision for starting/ stopping the individual machine of the line should be made available
6. The electrical motor supplied should be from reputed manufacturers having an efficiency of 80% and above
7. Control panel for the entire plant should be provided along with indicator lamps and Voltage,
8. The charges for wiring the individual machinery with necessary and regulatory safety features should be included in the scope of supply
9. The AMC for the entire plant (after warranty period) should also be indicated
10. Please mention the amount of steam ( $\text{kg/m}^2$ ) required for sorghum/ bajra line and area should be marked in layout for future procurement.
11. Please mention the area required for each line and arrange to provide layout drawing accordingly.
12. The colour scheme of painting of all the machines shall be of uniform colour

**NOTE:**  
 BE - Bucket elevator  
 DMS - Drawer magnet separator  
 FBD - Fluidized bed dryer  
 WBPM - Weighing & bag packing machine



**SECTION A-A**



**PLAN**

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DATE	18/08/2017	DESIGNER	DR. S. S. S. S.
CHECKED		SCALE	AS SHOWN
PROJECT	RESEARCH INSTITUTE, MYSORE - 570002	TITLE	SORGHUM PROCESSING PLANT
DRAWING NO.		SHEET NO.	01
REVISED NO.		REVISED NO.	

Beak Sharp Edges