

## **Parallel Twin Screw Extruder for Food Application**

Versatile Twin Screw Extruder for processing / extrusion of various food applications including rice, cereals, pulses and other ingredients.

### **Technical Specifications**

1. Twin Screw Extruder: Parallel, co-rotating type
2. Screw Diameter: approx. 20 mm
3. Barrel Length: approx. 40 D barrel
4. Feeding Ports: Multiple feed openings required. Example - feed openings at 10D, 20D & 30D apart from main feed opening at 0 L/D. It should be possible keep these openings closed or used either for feeding and/or as venting ports. There should be possibility to meter additives / gas at multiple points (preferably just after the feeding ports).
5. Segmented screws: One set of screws optimized for general food applications should be included. Number of screws elements and type included should be mentioned.
6. Heating/cooling zones and temperature controller: At least 4 heating / cooling zones with adequate mechanism for heating and cooling along with suitable controllers.
7. Horizontally divided barrel, which can be tilted open on both sides for visual assessment of individual processing steps, that facilitates for easy cleaning of screw/barrel.
8. Driver type power: The driver should be adequately powered and should have a variable frequency drive. Eg.16 KW inverter type variable frequency drive (higher drive power is preferred).
9. Screw speed: It should be possible to vary the screw speed. Eg.1200 rpm or more
10. Through put: Throughput should be in the range 1– 20 kg/hour
11. Torque: Maximum Torque 80Nm, Per screw torque: 40 Nm.
12. Pressure: Upto 350 bar
13. Extruder should also have electronic pressure measuring transducer for measuring the stock pressure in the die head or barrel.
14. Thermocouples for temperature measurement should be included wherever necessary.
15. Heating range: Ambient to 400°C or more.
16. Material of construction: Barrel-PM Steel properties, food approved grade, distortion free, hardened and high abrasion resistant.
17. A complete water circulation / distribution system including required solenoid valves for water cooling of the complete process unit. The water circulation cooling unit should have cooling power of 15kW at 90 deg C or more and a flow rate of upto 30 l/min.
18. One main vertical dosing unit with hopper should be included with steplessly adjustable drive speed 5 – 150 rpm or more. The hopper volume should be 3 ltrs or more. The feeding unit should allow feeding particles upto 5 mm.
19. Extruder system should be operated and controlled through windows based communication & Extruder software separately, to enable faster communication, self-intelligent modules, error diagnostic. General extruder evaluation software including free selectable optical and

acoustical alarms or shut-off of the system should also be included. The system should also be capable of working without a PC in case of exigencies through local panel.

**20. Die Assembly, cutting device & other accessories – all items below should be individually offered with separate prices to choose based on requirement and budgets**

- Round Die Assembly
  - Insert nozzle size 1mm, 2mm, 3mm, 4mm and 5mm made up to stainless steel, with tapped measuring borings for insertion of thermocouple or pressure transducer.
  - Insert for Dal
  - Insert for Basmati Rice
- Noodle Die Assembly
  - Insert with nozzle 4x 1 mm
  - Insert with nozzle 4x 2 mm
  - Insert with nozzle 1x 4 mm
- Tubing Die for Macaroni
- Ribbon Die Assembly for extrusion of ribbons 25 x 1 mm made of stainless steel
- Die assembly for making rice and pulse shape extrudates
- Cooling / Circulation device as required / recommended for die assembly / cutting device should be offered
- Extruder Cutting device: for cutting expanded extrudates of round shape with cutting rotor & exchangeable knives with Rotor speed sleeplessly adjustable between 10 & 250 RPM.
- Required necessary accessories like thermocouple for temperature measurement with compensation lead for measuring stock temperature, connection cable to be included in the main scope of supply.
- Peristaltic pump having maintenance free brushless DC motor suitable to operate 230VAC / 50 Hz, maximum speed 200rpm, +/- 1% speed accuracy for dosing of liquids with dosing bolt, cover plate for adding liquid.
- Other options recommended / available for feeding may also be offered separately
- A suitable vacuum device if recommended should also be offered

**Other general important minimal features:**

- The mains power On/Off switch with built in safety lock to be provided on the operator panel.
- Emergency shut down on the front panel with easy access.
- Protection for torque overloading
- Freely selectable torque, temp and pressure alarm and display values through software.
- A safety switch with the help of which the instrument can be stopped at any stage
- Safety panels covering the barrel on either side and Distinct Stickers for HOT zones
- Overload recognition during start-up phase and during work, with safety cut-off.
- Overload alarm when exceeding the 80 % load

- Alarm outputs for “ready to operate”, default and overload.
- The system must use CAN open BUS Technology which allows simulation and plug and play operation of accessories and modules

**Should include:**

1. Necessary spares & consumable if any for trouble free operation to be included
2. Vendor should have at least 2-3 Installation of similar kind of Extruder used for Food application in India and also should support with performance certificates.
3. Warranty: 1 year.
4. Installation, commissioning & operation training for the offered system should be provided by the Supplier.
5. Vendor should have strong service support in India.
6. The OEM should ensure availability of spares and consumable for a period of 7 years from the date of installation.
7. Detailed technical compliance statement along with detailed catalogue & brochures for the offered system should be provided along with the technical bid.