

Appendix 1

Specifications for pilot equipment for preconditioning and extrusion

The requirements for pilot preconditioning and extrusion equipment are listed below.

The Buyer has a right to reject the tender if there are any deviations from these quality standards but may accept deviations if the overall tender is deemed responsive.

Performance beyond the required quality standards will be awarded a higher score.

The performance of the equipment system under “Technical solution” will form a significant part of the evaluation of the tenders under the Quality award criterion.

The tender should include answers/comments to all requirements, and a further description where appropriate – highlighting the functionality of the system and its user friendliness.

The description should also include any additional functionality or other options that adds value for the Buyer.

The technical solution shall:

- Consist of a preconditioner and an intermeshing co-rotating twin-screw extruder.
- Meet requirements for aqua feed applications.
- Have a loss in weight feed hopper with the possibility of volumetric feeding.
- Filling of the feed hopper must be interlocked to an existing external feed container.
- Have a separate water and steam dosing and regulation systems for the pre-conditioner and extruder barrel.
- Have a computer-based machine-operator interface with possibilities for logging process data.
- Have online remote-control possibilities for software upgrading and service applications.
- Have a hygienic design.
- Be easy to clean.
- Be easy to operate.
- Be simple to maintain.

Preconditioner:

- Have a typical operating range of 150 – 300 kg/h based on different feed ingredients and mixes (e.g. plant, fish and animal protein and plant carbohydrates and starches).
- Have a high residence time and mixing capacity.
- Have water and steam dosing and regulation systems giving an outlet temperature up to 100 °C and moisture up to 30%.
- Have a slurry/oil dosing and regulation system including a holding tank with heating jacket (steam) and mixing possibility.

Intermeshing co-rotating twin-screw extruder:

- Have a typical operating range of 150 – 300 kg/h based on different feed ingredients and mixes (e.g. plant, fish and animal protein and plant carbohydrates and starches).
- Have a wide range of optional screw elements and easy to interchange.
- Have die plates and dies for a production of typical extrudate product diameter in the range of 1.0 – ≥12 mm.
- Have water and steam dosing and regulation systems enabling moisture level up to approximately 40% upstream the extruder die.
- Have a slurry/oil dosing and regulation system including a holding tank with heating jacket (steam) and mixing possibility.
- Have sensors for temperature and pressure readings of product behind the die.
- Have a sectioned extruder barrel with temperature control on each section.
- Have adjustable vented head (degassing) possibilities.
- Have a variable speed knife assembly for extrudate cutting.
- Optionally have an online system for regulating of SME/expansion based on mid barrel restriction and/or back pressure valve regulation.