Hoopman equipment & engineering

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Fluid density separator VSG-09

A brand new Liquid Density Grader with more capacity and automatic control!

The new Liquid Density Grader is made with a higher capacity than the old one. For example now we can sort 42kg of tomato per hour. The Separator works with a liquid mixture with a specific weight. Due to the new control panel the VSG-09 is capable to change the separation on the wanted amount of fraction difference. The new VSG has a integrated weighing system which controls the fractionizing. A combination of expertise in seed separation technology and technical process-engineering resulted in a practical and very precise machine.

The VSG separator can be used for separating seeds on specific weight, also when only minor differences are present. Because the high correlation between specific weight and germination vigour, the unit is used to optimally upgrade the product. In comparison to other gravity separating systems, this system is clearly superior in grading accuracy. The unit offers highest fine tuning and consistency of density and in comparison to gravity tables and air flow systems, particles remain in the flow for a much longer time, all adding up to higher levels of product quality with less discarded product.

Practical applications:

- Selecting seeds with higher germination and vigour
- Upgrading of germination - vigour in seed lots
- Eliminates difficult weed seeds and other impurities
- Elimination of immature seeds
- Retention / recovering of good seeds out of poor samples.

The VSG system achieves high quality with a minimal loss of good seeds. The advantages are:

- High separation efficiency, where more good seeds will be recovered from seed production lots. Where conventional cleaning efficiency stops at around 10%, the fluid density separator system will increase this up to 30% in one pass.
- Because of the higher accuracy, seed productions as a result need lower volumes; production costs can be reduced by more than 50 % compared to the conventional processing.
- The gentle separation and drying process gives no seed damage, resulting in high germination percentages of the good seeds selected.
- When treating high value seeds, a quick return on investment can be obtained. Especially in problematic seed productions and seed production years, the VSG makes it possible to keep achieving high quality levels.

Principle of operation

The seeds are fed continuously and are evenly metered by the special feeder rotary valve into the system. This rotary valve serves additionally as sealing device for the system. After mixing with the liquid, the product is fed into the separating bowl or vessel where the separation takes place. As the liquids used have a low surface tension and a great adhesion to seeds, the liquid will attach evenly to the seeds and prepare them for a precise separation. The actual separation of the seeds takes place inside the separation bowl based on difference between specific weight of the seeds, and the density of the special liquid, that can be exactly determined and adjusted.

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Seeds with a higher specific weight in relation to the prepared liquid will sink and leave the separation bowl at the bottom. Seeds with lower specific weight will rise, float and leave at the top of the separation bowl. Both the heavy and the light fraction are separately discharged to a conveyor belt with a drying compartment. The liquid evaporated there is condensed, reclaimed and returned to the system for re-use. For safe operation and environment the required (external) dust extraction capacity is 7.000 m3/hour (at 100 mm-wc). For easy access and cleaning the machine, and to reduce heat production and noise, the cooling unit is installed separately from the machine, in many cases at the outside of a separation wall.

Technical data

- Capacity : 5 - 80 kg/hr (strongly depending on the type of seed)
- Main dimensions : l x w x h = 1.170 x 880 x 2.240 mm (fluid separator)
  l x w x h = 600 x 600 x 1.600 mm (control panel)
  l x w x h = 500 x 500 x 430 mm (cooling unit)
- Electrical connection : 230/400 V, 3 phases, ground + neutral, 50 Hz
- Installed power : 3.5 kW
- Specific weight range : 0.66 – 1.47 g / cc (hexane/chloroform)
- Material : various
- Finish : glass pearl finish
- Noise emission : < 80 dB(A)

Basic unit includes:

- Electric-electronic service- and control panel with PLC control and cables between machine, cooling unit and control panel (max. distance 2.000 mm)
- Nitrogen valve with reducer connected to the system, to adapt components.
- Correction bottles density, 1,000 ml
- Cooling unit
- Density measuring / control module
- Hexane and oxygen measuring device to verify-adapt the components of the system (Dräger)
- Gas pump equipped with frequency converter
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- Modem for external control and servicing of plc unit (requires one direct phone line to connect, not permanent)