Wet Granulation | Shugi Flexomix

The main difference between dry granulation (compaction) and wet agglomeration is in the characteristics of the granules that are being produced. With compaction the granule is produced by pressing the material together under pressure and that creates granules with a relatively high density and a rather solid structure. These kinds of granules are rather sturdy and don't break down very easily, the disadvantage being that in general these kinds of granules don't dissolve very well.

With wet aglomeration the particles are not pressed together but are bound together with the aid of a liquid or binder. This way a granule with a more open and porous structure is produced. The shape of these granules is in general more rounded off. This technique is a good choice if you are interested in good solubility or dispersion characteristics of the granules. Agglomeration also improves the flow characteristics of the product, reduces the density and reduces the amount of dust in the end product.

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The process:

The Shugi Flexomix 160 can be integrated in a unit where we have installed a continuous Shugi Fluid bed dryer (2m² / 5 zones) in combination with a continuous sieve and a milling system. With a Loss in Weight system we can charge up to three different powders in the right proportion towards the Shugi Flexomix. With the aid of gravity the powders are then transferred through the specially designed vertical cylindrical mixing chamber of the Flexomix, whereby the liquid(s) is injected via spray heads positioned around the top of this chamber. Due to the positioning of the spray heads it is possible to simultaneously inject up to 4 liquids.

The wet granules that come out of the Flexomix can then be dried, cooled and sieved. The oversize will be milled and fed back to the sieve, the fines will be fed back to the system for recycling and the end product will be packed off to the required size.

A direct mixing action in combination with a relatively short residence time (1 -2 seconds) makes it possible to achieve high throughputs on rather small machines. The Flexomix 160 is developed to process about 1000 kg per hour.

The mixing chamber and the rotor are easily accessible and therefore can be cleaned rather easily. The choice for a processor depends on your requirements regarding size, porosity and density. Next to that you need to consider your preferences regarding shape and if you want high shear forces involved. The particle size for product from the

Shugi and the Lödige CB-30 is rather fixed and typically is in the range of traditional detergent products.

The End product:

The Shugi Flexomix produces homogenous granules that are typically in the size range of 0.2 – 1.0 mm with an average size (D50) of about 500 micron (µm). The structure of the granule will have a lower density and higher porosity level than granules that are produced on the Lödige CB-30. Typically the Flexomix is designed to produce about 1000 kg of product per hour. What can be realistically achieved depends on the characteristics of the raw material, the specifications of the end product and on the required packaging.

The disadvantage of the unit is that it is a very complicated unit with a wide variety of integrated process parts. It is designed for continuous processing and therefore not really suitable for the production of smaller quantities. Minimal quantities are in the range of about 20 T campaigns. Due to the complicated character of the process-unit the change over costs (set up and & clean down) are rather high.

We are looking forward to hear if this unit could be of interest to you.