

GET YOUR SLURRY IN A HURRY

Already 12 years ago Hosokawa Micron BV developed a new revolutionary high shear mixer which could not be compared with any other high intensive mixer available on the market. Through the years, HMBV found out that this mixer is not only excellent in mixing and dispersing cohesive powder like pigment, toners and pharmaceuticals but also can mix slurries very well.

Working principle of the Cyclomix™ high shear mixer

The mixing vessel is conical shaped and has a central rotor which rotates at a speed up to 30 m/s. The speed of the rotor creates centrifugal forces and pushes the product to the vessel wall. The conical shape of the vessel causes an upwards movement of the product. The cover part of the mixer guides the products towards the center of the mixer. Here it will be re-introduced to the bottom part of the mixing chamber where the mixing process starts again. (see figure 1, flow pattern Cyclomix™) The patented mixing mechanism of the Cyclomix™ ensures a homogenous end product and an ultra short batch time.

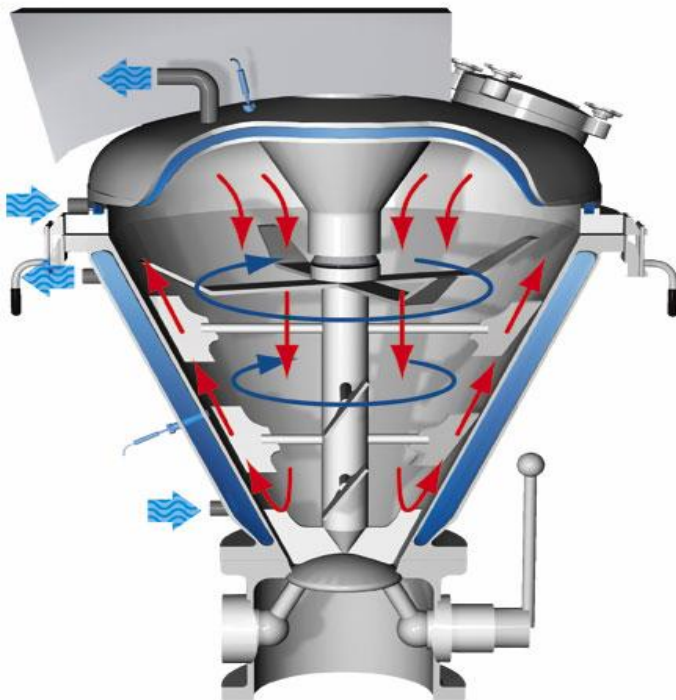


Figure 1: Flow pattern Cyclomix™



Mixing slurries with a high intensity mixer

As an example the Cyclomix™ can be used for intensive mixing of liquid-like recipes and can optimize mixing lines for low viscous and high viscous slurries.

The Cyclomix™ can for example be used for replacing central drive dissolver or Eccentric pan mixers which are typical for these kind of applications.

The main problems customers are facing in their existing mixing lines are:

1. Rather long mixing time of for example 1 Hour for a batch of 1000 Litres.
2. Inhomogeneous product quality after mixing.
3. Time consuming cleaning operation between batches and the necessity of operators entering the mixer vessel for cleaning.
4. Flexibility of process.

Processes:

When the Cyclomix™ is used for intensive mixing of slurries, the powder / liquid ratio can vary from 20-80% to 99-1%. Especially the combination of viscous liquids and the addition of small amounts of powdery additives can cause great difficulties with the existing dissolver mixing systems. The mixing time can be long and the reproducibility between batches is mostly poor.

Ultra short batch times

As an example we can calculate with a process time in a 250 litre mixer of approximately 3 minutes. This process time is including a cleaning cycle after every batch, charging and discharging. The use of one single Cyclomix™ 250 litre results in a capacity of 5.000 litre per hour. In this example the capacity of the Cyclomix™ was 5 times higher than a dissolver system.

Constant quality

Due to the unique flow pattern in the Cyclomix™ the complete content of the mixer is in intensive motion, i.e. no dead spots can be found. Therefore no solids will be deposited in to dead zones in the vessel and a minimum of product will remain on the wall and cover. Result: a constant mixing quality and no disturbance by agglomerates which might be reintroduced in a certain stage of the mixing process.

Cleaning

The conical shape of the mixer and the small gap between rotor and vessel ensures an easy and full discharge. Due to the sticky nature of products some homogeneous mixed product remains after discharging.

In dissolver systems this layer at the vessel wall needs to be removed frequently and needs to be removed manually. This is a time consuming and difficult operation. Every time the dissolver needs to be dismantled, in some cases solvent connections need to be blocked and the system needs to be cleaned manually. In the Cyclomix™ process, mostly one of the liquid components of the recipes can be charged first to the mixer. The Cyclomix™ will run for about 5 seconds at a speed of 20 - 30 m/sec. During this cycle the Cyclomix™ is cleaning itself with the process liquid.



After completion of this cycle, the mixer can be charged with the remaining liquids and solids after which they will be mixed. This procedure will remain after every cycle.

By using the ability of the self-cleaning system of the Cyclomix™, cleaning becomes an integral part of the process saving a lot of time and effort.

Flexibility

An important goal of most of our customers is flexibility in serving their market, which results in many different recipes and various batch sizes. The Cyclomix™ is fully capable to fulfil these requirements. It can be used from 25% up to 100% filling rate resulting in a constant mixing quality.

Improve your mixing line

Interested in testing the Cyclomix™ to improve your mixing line for thin or thick slurries, Hosokawa Micron BV offers you a test **free of charge** for each slurry application applied for until the first of October 2008.