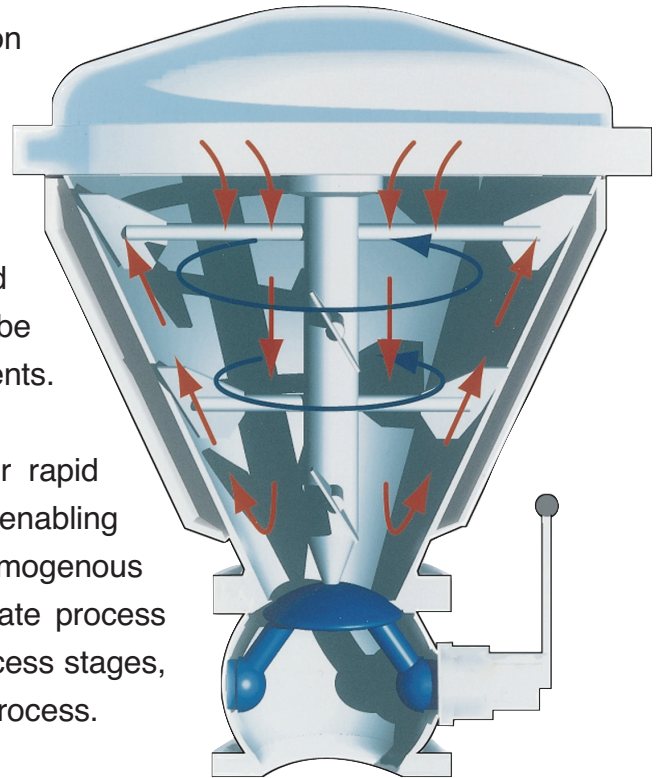


Cyclomix Melt Binding Offers Reduced Processing Time and Improved Particle Uniformity

Melt binding agglomeration offers pharmaceutical processors potential cost savings with shorter processing times and fewer processing steps than traditional wet agglomeration techniques. Those processors who use the Hosokawa Micron Cyclomix route to melt binding agglomeration also recognise significant improvements in particle uniformity and particle stability.

Melt agglomeration is currently used for the production of a variety of pharmaceutical dosage forms and formulations, such as sustained release, improved solubility and modified transdermal passage of drugs. Melt agglomeration can also be utilised where the application of solvent or water is not allowed and melt binders like stearic acids, lipids or waxes can be applied to mask the bitter tastes of some active ingredients.

The Cyclomix combines high heat transfer rates for rapid heating and cooling of a wide variety of mixing regimes enabling fast dispersion of solid binder into the material. With homogenous distribution of the melt on single particles and accurate process control, utilising distinct mixing speeds in different process stages, the Cyclomix is now established as a key unit in this process.



This example utilising stearic acid as the melt binder illustrates the potential time and operational cost savings offered by the Cyclomix.

The powder and the melt binder, in solid form, are introduced into the Cyclomix and mixed intensively for a short period of time at high speed. The shear produced in the Cyclomix results in the rapid dispersion of the melt binder. At low speeds the mixture is heated by means of a double jacket around the vessel, with the convective flow pattern created by the Cyclomix enabling quick transfer of heat from the jacket into the mixture. The mixture is heated up to just above the melting temperature of the melt binder (65°C). The resulting liquid coats the particles and starts to glue them together. When the required agglomerate size is reached the jacket temperature around the vessel is switched from heating to cooling, thus cooling and solidifying the melt. Under continued mixing the product is cooled to a temperature just below 65°C, leaving stable and uniform particles.

The process time can be decreased even further by directly introducing cooling media into the mixture such as carbon dioxide or liquid nitrogen during the the cooling phase.