



Applications for High Shear Mixers
Redispersation of Filter Cake



Filter Cake Recycling

Solids suspended in a solution may be collected when passed through a filter. The layer of sedimentation formed by the solids is known as the “filter cake.” Filter cakes may be formed from a wide range of materials with varying purposes. Some are simply the by-product of filtered solids, while others may be filter aids, such as kieselguhr [see coramix.com/learn], where the filter cake creates a finer layer of filtration.

The filter cake eventually needs to be removed/replaced as too thick of a layer can impede flow and collect unwanted contaminants. Where the cake is composed of recyclable materials, it may be broken down and redispersed for reuse. Some reused materials include:

- Pigments
- Dyestuffs
- Pharmaceutical active ingredients
- Optical brighteners
- Detergent additives

Mixing Process

Filter cake is removed as a solid mass, with hardness varying based on particle size and compaction. Traditional methods of breaking down the solids involve soaking the cake in a solvent. The cake may undergo a “wash” to remove any remaining base fluids, or “mother liquor,” from the material. Requirements of processing the cake include:

- Filter cake must be broken down enough to form a slurry.
- Particle sizes must be small enough to undergo a sufficient amount of contact between the solid particles and surrounding liquid.

Mixing Issues

Redispersion using traditional agitators contains multiple problems:

- Agitators lack the minimum shear to break down large and hard clumps of cake.
- Long periods of soaking prior to redispersion may be required.
- Vigorous mixing is required to break down hard agglomerates, taking traditional agitators a considerable period of time.

Our Solution

Dispersion: Instead of slowly stirring the mixture until it is homogeneous, Coramix mixers use high-shear and mechanical design to disperse the filter cake, greatly reducing each batch's cycle time while eliminating any agglomerates.

Phase 1: The Coramix inline mixer is connected with the eductor assembly, as well as pipes from the tank outlet to the mixer inlet and from the mixer outlet to the top of the tank. Base fluid is added to the tank, and the mixer is started to recirculate the fluid.

Phase 2: The powder feed valve is opened, and filter cake is added directly into the hopper. The inline mixer pulls in the material and deagglomerates the clumps as they pass through the high shear mixing zone.

Phase 3: After all of the filter cake is added, the valve is shut and mixing continues while additional ingredients are added.

Advantages

Coramix high-shear mixers offer a wide range of advantages over traditional agitators:

- Rapid mixing speeds drastically reduce mixing times.
- Capable of breaking down larger and harder agglomerates and lumps of material.
- Pre-soaking or re-working may not be required.
- "Wash" steps may be done continuously, reducing process times and the need for extra vessels.
- Reduced particle sizes create a stable solution.



Contact: For more information on Coramix products go to Coramix.com, or contact our sales team at Sales@Coramix.com for help in configuring a mixer to fit your needs.