

Operation of a Typical, Batch-Homogenizing System

In order to ensure proper homogenizer performance in any batch system, a number of factors must be considered. (The following sketch indicates a typical batch homogenizer system.) Two considerations of major importance are possible air incorporation into the product and loss of homogenizer feed pressure at the end of a batch or when switching from one batch tank to another.

The following steps are necessary, in order to achieve and maintain proper homogenizer operation:

1. Be sure that the batch tank filler lines extend well down into the tank to minimize splashing and, thus, air incorporation. This requirement also applies to any recycle lines which may be installed from the discharge of the feed pump or homogenizer.
2. Use a low-speed agitator to provide adequate mixing of the product ingredients and avoid vortexing and the resulting air incorporation.
3. Install a low-level sensor probe in the batch tank to shut off the agitator when the liquid level is approaching the top of the blade and to sound an alarm, notifying the operator that the batch is almost depleted.
4. Make use of a feed pump to ensure proper movement of the product from the tank to the homogenizer. A centrifugal-type pump is recommended and should be sized for an output minimum of 110% of maximum homogenizer capacity.
5. Be sure that the lines leading from the batch tank through the feed pump to the homogenizer are adequate, based on pressure drop calculations and consistent with operation manual recommendations.
6. Whenever possible, avoid the use of a suction strainer, since insufficient flow will result when the strainer becomes clogged. If a strainer is required, utilize a dual-type unit and include a low pressure alarm in the homogenizer suction line.

For Homogenizers Equipped with Manually-Operated Homogenizing Valves

A low pressure switch should be located in the suction line and wired so as to sound an alarm and shut down the homogenizer whenever the infeed pressure drops to a set point.

It is vitally important to back off the manually-operated homogenizing valve, before restarting the homogenizer after a shut-down.

As an alternative to shutting off the homogenizer, an automatic, three-way valve can be located downstream of the homogenizer to recycle the product back to the batch tank, during periods of low infeed pressure.

For Homogenizers Equipped with Hydraulic Valve Actuators (HVA)

A low pressure switch located in the suction line can be used to shut off the HVA motor when the infeed pressure drops below a set point.

An automatic, three-way valve should be used to recycle the product flow, until the low pressure condition is corrected.

A time-delay relay in the system can be utilized to return the three-way valve to its original position, when the flow of properly homogenized material is once again attained.

SCHEMATIC OF A TYPICAL BATCH-HOMOGENIZING SYSTEM

