GLOSSARY OF MIXERS AND MIXING TERMS

AGITATORS – A general or alternate term also used with regard to mixers. The term is normally used in respect of impeller type mixers or top and side entry mixers.

BAFFLES – Baffles are vertical mounted strips of metal that serve to reduce vortexing in mixing tanks. The baffles are normally mounted on the sides of the vessel or just away from the walls.

BATCH MIXERS – Such mixers handle batches of materials or product in sequential fashion and mix each batch to the set specification, before swinging over to the second batch vessel and so on.

BLENDERS – Blenders may blend liquid – liquid mixes or powder – powder mixes. Blenders are designed for mixing, blending, dispersing and kneading of light, medium or heavy density dry materials, and medium to viscous pastes. There are three basic categories, i.e. rotating shell, rotating impeller, or a combination of both the above.

COLLOID SUSPENSIONS – Colloid suspensions are composed of a framework of one kind of particle, which supports other particles within the substance. Colloidal suspensions are not stable. Certain colloids will break down when they are heated. Eventually they lose all their structure, becoming liquids.

CONE BLENDERS – These are blenders of the rotating shell type that operate as two cones or V-blender types to achieve the blending of light to heavy powders and abrasive materials.

CONTINUOUS MIXERS – Such mixers process products from continuous fed product components at the front and discharge the mixed stream from the end of the unit. Static mixers are a particular example of fully continuous mixers.

DILANTANT MIXES - This is a property of certain gels which get more viscous (even hard) when you apply a suitable force. When a small sideways force is applied to certain dilantants, the weak bonds between the particles break, and the substance flows just like a liquid. The opposite of dilantant is thixotropic.

DISPERSERS – Mixers in which agglomerates or clumps of particles are broken down into finely dispersed products.

DISPERSION - Dispersion is a process of mixing by the breaking apart of solid particles into a bulk liquid using a high speed, rotating saw-tooth blade, or other special impeller design, and subsequent mixing thereof. The blade or impeller produces high shear forces that break apart the particles.

EMULSIFIERS – These are mixers that achieve the emulsification process through a combination of high speed rotation and centrifugal force through a perforated screen.

HIGH SHEAR MIXERS OR HIGH SHEAR DISPERSERS – Mixers designed for use in liquid mixing systems where a particle size reduction or breaking apart of agglomerated solids is required.

HOMOGINIZERS – These are high-shear mixers that subject materials of different viscosities to intense mechanical and hydraulic mixing forces, enabling a uniform blend.

IMPELLERS - Impellers are rotating components of a dynamic mixer, which transfer energy from the motor that drives the mixer to the fluids being mixed by forcing the fluid away from the centre of rotation. There are two basic types of flow patterns that can be developed by mixing impellers: axial flow and radial-flow.

LABORATORY MIXERS – General purpose mixers used to perform a variety of laboratory mixing requirements, such as mixing, homogenizing, blending and dissolving. These are usually propeller type mixers.

MILLS – Bead or Pearl Mills use beads of glass or high quality sand to break down the solid component of the mix into very fine aggregates.

MIXING – Mixing has been defined as the intermingling of two or more dissimilar portions of a material, resulting in the attainment of a desired level of uniformity, either physical or chemical, in the final product.

MOTIONLESS MIXERS – Also known as static mixers, inline mixers and pipeline mixers, these are continuous mixers that operate inline and have no moving parts. Blending of various fluids can be achieved or the addition of chemical additives can also be incorporated.

RHEOLOGY - Rheology is the study of the deformation and flow of matter under the influence of an applied stress. Rheology is also simply known as the study of viscosity. In engineering, rheology has had its predominant application in the development and use of polymeric materials. Rheology modifiers are also a key element in the development of paints in achieving paints that will level but not sag on vertical surfaces.

RIBBON BLENDERS – Stationary shell, rotating horizontal impeller type, and possibly the most versatile and widely used blender, this unit is suitable for an extensive range of products, from dry to paste. Various types of impellers are offered, including continuous or interrupted spirals, “pug” blades and aerating tips.

ROTOR – STATOR MIXERS – Rotor stator mixers consist of a rotary stator in close proximity to a stationary stator to produce intimate mixing. The differential speed between the rotor and the stator imparts extremely high shear and turbulent energy in the gap between the rotor and stator. Typical rotor tip speeds range form 10 to 50 metres per second.

SIGMA MIXERS – See Z-BLADE mixers below.

STANDARD TANK – The standard tank configuration is a useful reference standard for mixing process design. It provides adequate mixing for most processing requirements found in industry. However, it should be stressed that the Standard Tank Configuration is an arbitrary standard which in some circumstances is not the best configuration to use. For full details of key dimensions refer the Standard Tank section elsewhere on this site.

STATIC MIXERS – Also referred to as in-line mixers or motionless mixers, static mixers have no moving parts and operate continuously. Static mixers are efficient and generally require little maintenance. They are available in various metals and plastics, or PTFE lined plastic fitted pipes.

THIXOTROPIC MIXES – This is a property of certain gels which liquefy when subjected to vibratory forces like simple shaking, and then solidify again when left standing.

VACUUM MIXERS – These are predominantly top-mounted mixers with special vacuum seals at the mounting. They are used to extract air pulled into the product during the mixing process, or gas generated by reaction in the process.

VARISHEAR MIXERS – The unique Varishear® Mixer is a specialized disperser manufactured and marketed by Jones International. It is a superb productivity machine. It is capable of handling mixes of up to 100000 centipoises. The Varishear impeller is unique in its design and variability, due to the expandable impeller size, special tips and variable tip quantities possible.

VISCOSITY - Viscosity is a measure of the resistance of a fluid to being deformed by either shear stress or extensional stress. It is commonly perceived as "thickness", or resistance to flow.
Viscosity describes a fluid's internal resistance to flow and may be thought of as a measure of fluid friction. The study of viscosity is known as rheology.

VISCOUS – A fluid of high viscosity is viscous fluid.

Z-BLADE MIXERS – The 'Z' blade, or "sigma" mixer is designed for mixing, blending and kneading of medium and heavy non-flowing pastes. The impellers and bowls are accurately machined to close tolerances, eliminating build-up of materials and providing high shear and rapid distribution of materials.