LVT CLASSIFIER DESIGN

The LV Classifier is designed to provide 3 stages to the classification process (assuming a constant gas flow).

**Stage 1:**
Coarse feed material, recirculated oversize, and grits are directed down from the funnel cone chute onto the mill table where the change in flow direction helps to stir up the bed of material.

**Stage 2:**
Material directed into the LV guide vane pocket will experience velocity changes depending on the particle size. Coarser material will impact the guide vane, losing velocity and allowing gravity to direct it downward through the funnel cone. Near-product size particles will continue through and enter the space between the guide vanes and the rotor.

**Stage 3:**
The speed of the rotor will determine the actual classification point of the classifier system. Rotor speed can be easily varied by the operator in order to obtain the desired performance required by the plant.

Note that the classification in Stage 1 and 2 occur naturally by the design of the classifier. No adjustments or modifications are necessary. Changing the rotor speed is the only adjustment necessary to alter the classifier setting, and this is done simply by a change on the control panel.

Because the LV guide vane pocket is designed to separate coarse particles away from the rotor space, the classifier can provide efficient particle classification and achieve:

- Low power consumption
- High separation efficiency

CLASSIFIER CONCEPT

The central concept of the LV Classifier is aimed at improving the gas and material flow inside the mill. The main principles are:

- Allow more material to be directed to the classifier by optimizing the gas speed.
- Avoid fines returning to the mill and creating excessive recirculation in the mill body.
• Decrease the pressure loss in the separator.

These attributes are accomplished by the unique design of the internal components of the classifier; namely, the LV guide vane pockets, the unique rotor design, and the design of the grit funnel cone.

APPLICATION OF THE LV CLASSIFIER

LV Classifiers are applied to vertical roller mills and ball mills, handling a full range of materials. References are already more than 600 sets supplied to all over the world. All LV Classifiers show higher production rates, about 10-20%, and less specific power consumption, about 1.5 - 5 kwh/ton, comparing with other separators.

LV POCKET

Special construction of the LV pocket works as coarse material trap which material is carried by gas from mill mixing with fines. Coarse material caught by LV pocket moves down by gravity along LV pocket to funnel cone without mixing with fines. This construction makes “no fine in coarse, no coarse in fine”. Since material on mill table has smaller fine portions, vibration becomes smaller.
FUNNEL CONE

Funnel cone is not only to collect reject from LV Pocket and to feed material to table but also to control gas speed distribution between Classifier casings and funnel cone. This makes it possible to get the desired gas velocity between casings and funnel cone and to eliminate material internal circulation. Pressure loss becomes lower by reducing internal circulation of material.

FUNNEL CHUTE

Reject from funnel cone feed back to center of mill table through funnel chute. The special funnel chute is designed to feed material on to mill table smoothly with minimum height.

The hot gas and material enters the rotating cage through the guide vanes at a velocity approximately the same as the tip speed of the rotor. After entering into the separation zone, the solid particles carried by the airflow will be influenced by these three forces.

™ The “Centrifugal Force” generated by the rotor trying to reject the material into the pocket – shaped vanes;
™ The “Drag Force” generated by the air flow of the fan trying to pull the material into rotating cage;
™ The “Gravity Force” trying to pull the material down to the mill table below the classifier.

As the centrifugal forces have a greater influence on the bigger solid particles than the drag forces, the finer solid particles will be dragged into the rotating cage, whereas the coarse solid particles will be rejected into the pocket shaped guide vanes where the gravity force pulls the coarse particles into the grit funnel and rejects the material back to the mill. By regulating the speed of the cage it is possible to get a very exact size of the product. The special shape of LV pockets prevents the solids from spinning around the rotating cage inside the guide vanes which makes the LV Classifier ideal for classification of air swept material as it always allows new feed to the classifier without conflicting with the material under classification.