- **Discharge from bins & hoppers**

For a sufficiently high loading of particles, the discharge rate of solids is independent of the height of loading because of side-wall friction.

- **Rotary drums**

\[ \beta = \beta (\text{angle of internal friction, } \omega) \]

For moderate rotation speeds, the granular material is tilted at an angle \( \beta \). The top layer is composed of a thin layer of particles rapidly cascading downwards while the rest of the particles undergo solid-body rotation.