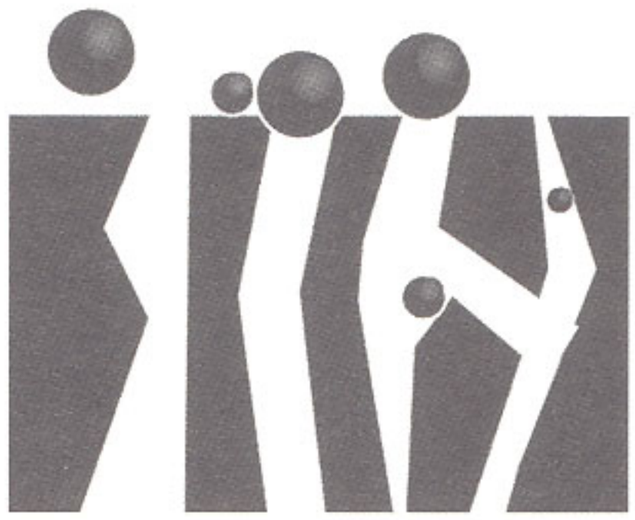
MEANS OF RETENTION

MECHANICAL RETENTION

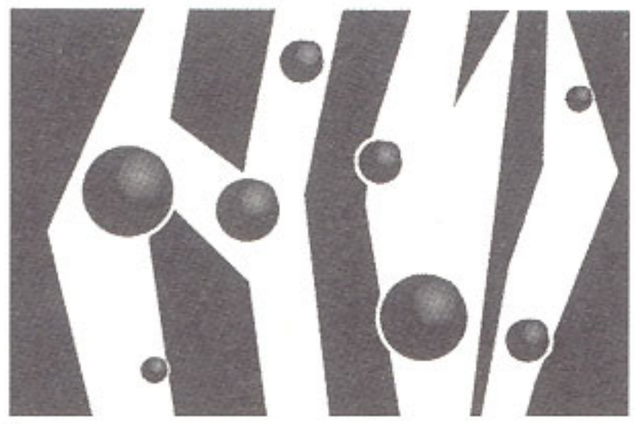
Mechanical retention occurs when a particle is mechanically restricted from passing through the filter medium. Direct interception, sieving, and bridging are mechanisms of capture that facilitate mechanical retention. Of these three methods of capture, sieving is the most dependable under normal forward flow conditions. If a particle is too large to move through a pore, unless the actual physical structure of the filter medium or particle is altered, the particle cannot be pushed through the pore. Particles captured by both bridging and direct interception are mechanically retained, but are more condition dependent than sieving. Pulsing or surging will dislodge a filter cake and/or small particles directly intercepted by media obstructions and, hence, release the mechanically retained particles. However, if operating conditions are stable, particles held by mechanical retention should not be released.



MECHANICAL RETENTION

ADSORPTIVE RETENTION

Adsorptive retention refers to the adherence of a particle to the filter medium due to interactions between the particle and the surface of the medium. The particle "sticks" to the filter. Phenomena behind this adsorptive affect include electrical and hydrophobic interactions. Smaller particles adsorb more strongly than larger particles. The tendency of particles to adsorb, however, is very condition dependent; a particle that is adsorbed can be desorbed. Adsorptive retention predominates for particles captured inertial impaction, diffusion interception, and electrokinetic attraction.



ADSORPTIVE RETENTION