

# **Sedimentation methods of size separation**

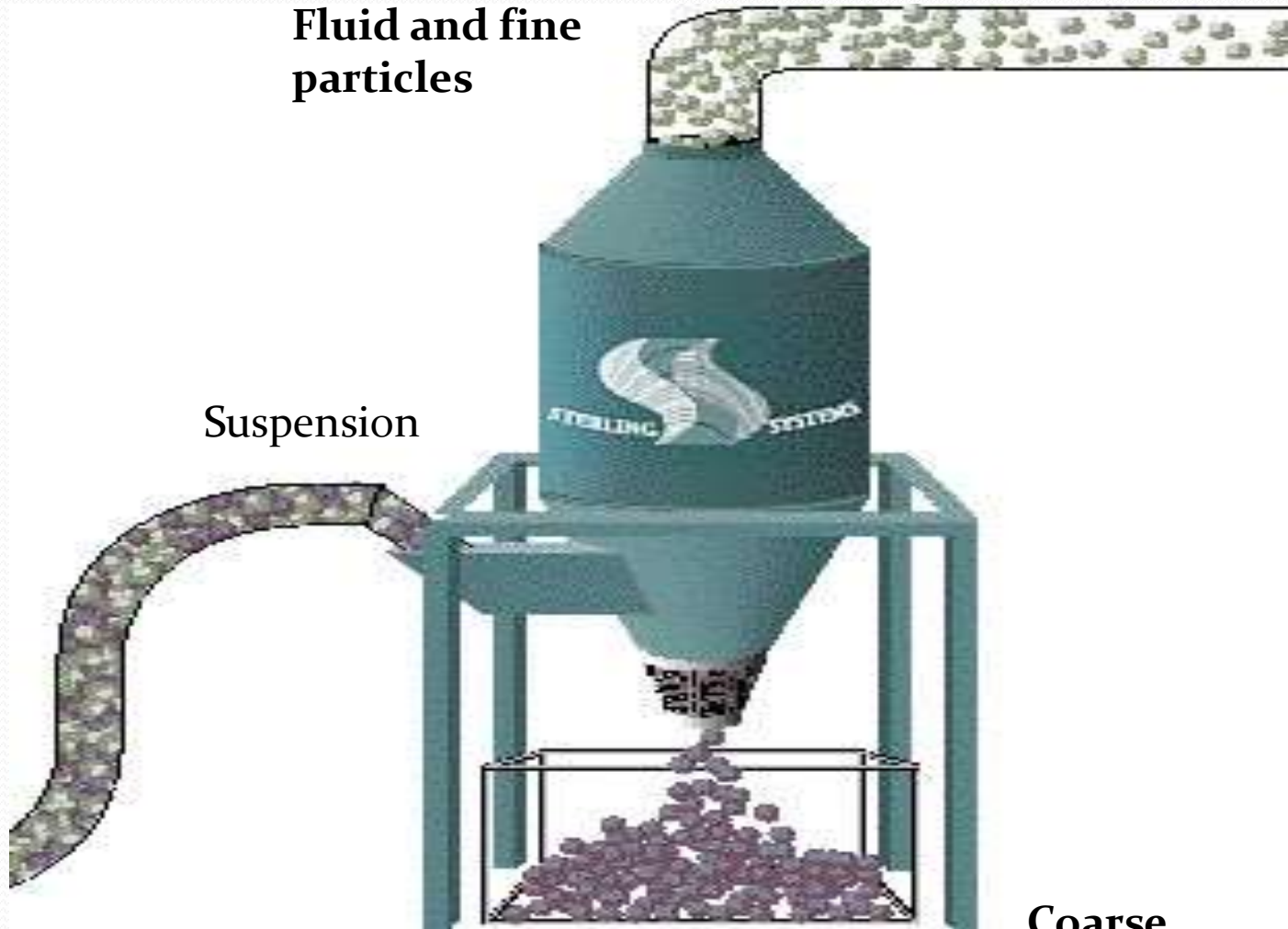
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# Elutriation Method:

Fluid and fine particles



Suspension

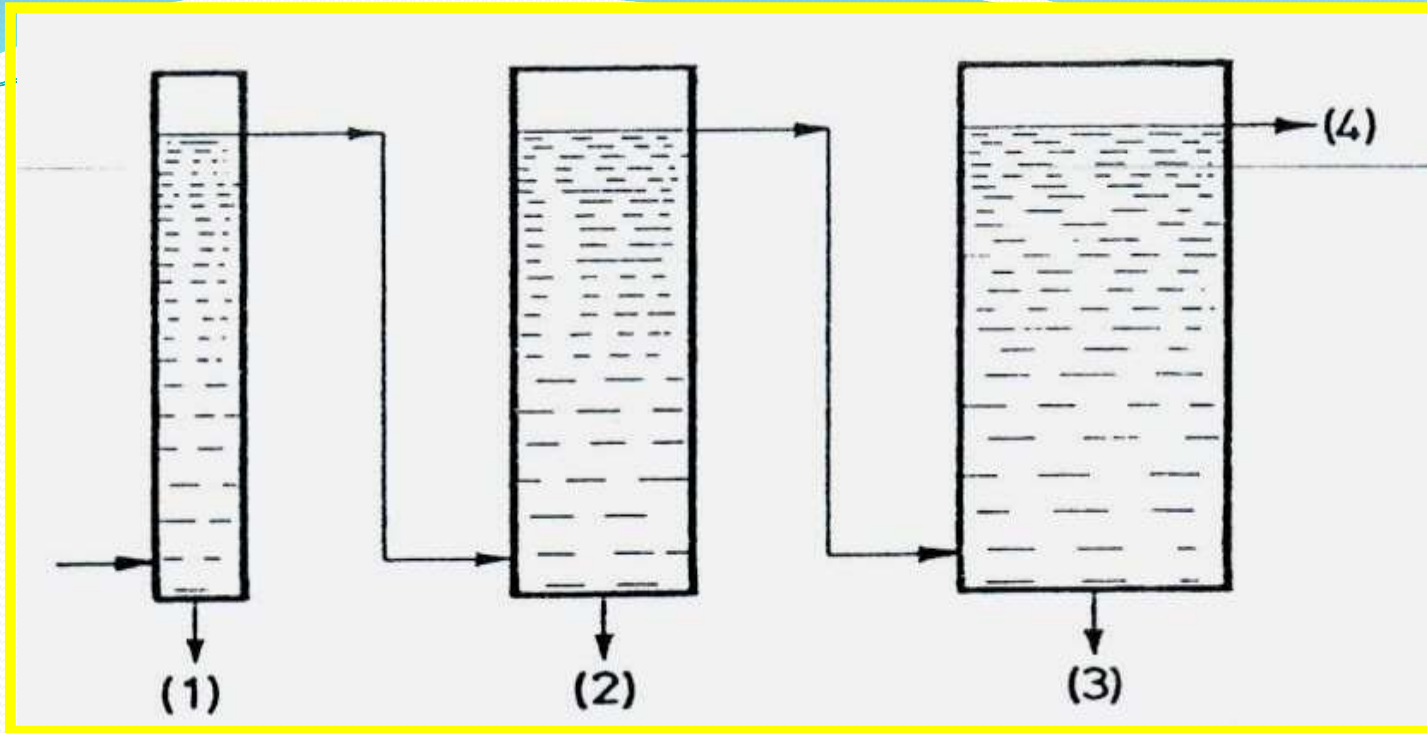
Coarse particles

## Elutriation



- The size separation of powder is based on the low density of fine particles and high density of the coarse particles.
- Elutriating tank is used to separate the coarse and fine particles of powder after levigation.
- The dry powder or paste made by levigation process is kept in an elutriating tank and *mixed* with a large quantity of water.
- The solid particles are uniformly distributed in the liquid by stirring and then it is allowed to settle down.
- Depending on the density of solid particles, it will either settle down or remain suspended in water.
- The sample is withdrawn at different heights through the outlets.
- These are dried and thus the powder with various size fractions are collected

- Nowadays in elutriation process, the particles are suspended in a moving fluid, generally water or air.
- The apparatus consists of a vertical column with an inlet near the bottom for suspension, an outlet at the base for coarse particles and an overflow near the top for fluid and fine articles.
- One column will give single separation into two fractions. If more than one fraction is required a number of tubes of increasing area of cross section can be connected in series.
- The velocity of the fluid decreases in succeeding tubes as the area of cross section increases, thus giving a number of fractions. These fractions are separated and dried.



## **Multi-stage elutriator**

**(1) to (4) are fractions of decreasing particle size**

## *Advantages of Elutriation Method*

- The process is continuous.
- Depending on the number of fractions required, the same number of tubes of different area of cross section can be connected.
- The separation is quick as compare to other methods of separation.
- The apparatus is more compact than as that used in sedimentation methods.
- The main disadvantage of this method is that the suspension o solid particles has to be diluted which may not be desired in certain cases.



**THANK YOU**