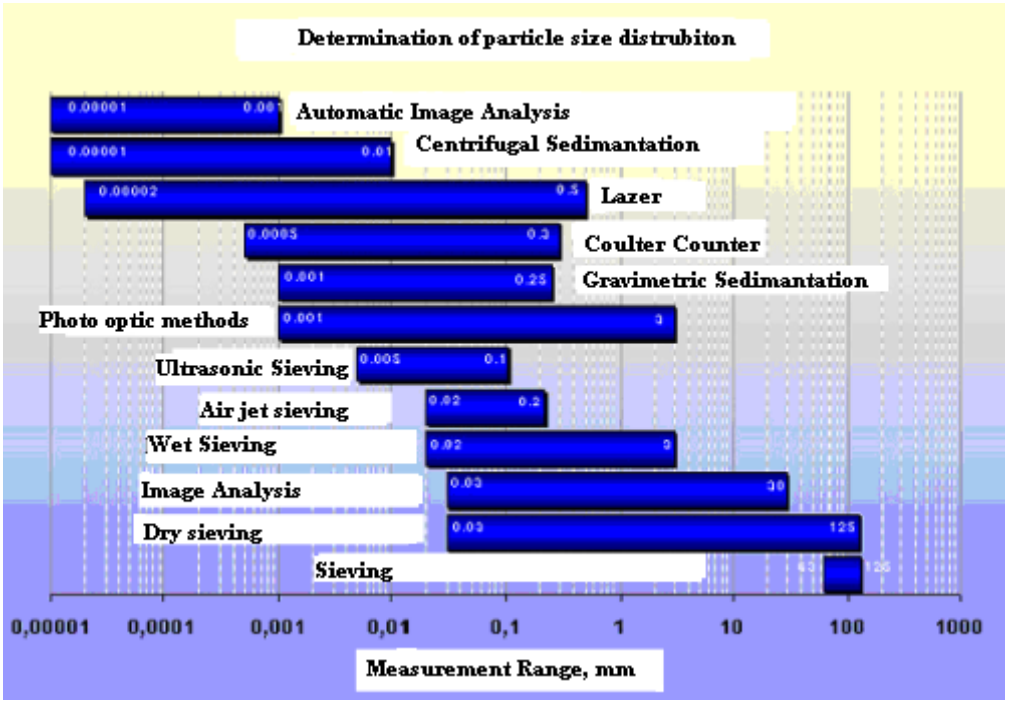
SIEVE ANALYSIS

1. Introduction

The primary function of precision particle analysis is to obtain quantitative data about the size and size distribution of particles in the material. There is a wide range of instrumental and other methods of particle size analysis available.



Sieve analysis is one of the oldest methods of size analysis and is accomplished by passing a known weight of sample material successively through finer sieves and weighing the amount collected on each sieve to determine the percentage weight in each size fraction. Sieving is carried out with wet or dry materials and the sieves are usually shaked manually or automatically.

Manual Sieving: Suitable for coarser particles than 0.038 mm. Sieves are used one by one starting from the largest size.

Automatic Sieving: Most often practiced for particle sizes ranged between 6 mm – 0.038. A standart serie of 6 sieves are put together and shaked on a Ro-Tap automatic sieve shaker device for 5-20 minutes.

Dry Sieving: Suitable for non-sticky and non-clay samples.

Wet Sieving: Practiced for finer size particles containing clay which have hard nature for dry screening.

2. Objectives

The objecive of this experiment is to reveal the particle size distrubution of a limestone sample in the size range of -2 + 0.038 mm with a sieve analysis prepared according to √2 serie and put the results together on a Gaudin-Schumann distribution function.

3. Experimental Procedure

A "Ro-Tap" Automatic Sieve Shaker device from Fritsch will be used with a serie consisting of **2.00, 1.00; 0.500; 0.300; 0.212; 0.150; 0.106; 0.074; 0.053; 0.038** mm sized sieves for particle size analysis of 300 grams of limestone sample. All size fractions will be weighed and noted at the end of the experiment.

4. Questions

a. Make a literature research on sieve analysis and different standarts.
b. Give information about the aim of industrial screening.
c. Put your experimental results on a Gates-Gaudin-Schumann (GGS) function. Draw and calculate:
i) Cumulative undersize curve and curve
ii) Mean (calculated)
iii) Mass Moment mean
iv) d50 and d80 sizes
v) Find the weights for the size fractions 0.038-0.106 mm and 0.212-0.500 mm from the graph.

d. Put the results derived from a sieve analysis of fine coal given in the table below and your experimental results also separately on a Rosin-Rammler function and calculate the parameters below:

i) Particle Size modulus (d')
ii) Size distribution factor (η)
iii) Specific surface coefficient (Ok1)

Size (mm)	**% Weight**
+0,063	6,0
-0,063+0,044	11,0
-0,044+0,0315	14,0
-0,0315+0,022	13,0
-0,022+0,015	13,0
-0,015+0,011	17,0
-0,011+0,008	9,0
-0,008+0,005	7,0
-0,005	10,0
Total	100,0