



ESTIMATION OF NOMINAL TOP SIZE USING ROSIN-RAMMLER REGRESSION

APPLICATION NOTE: 24

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Nominal top size (NTS) is defined as the largest aperture size which retains five percent of the material being screened (Afewu & Lewis, 1998). ISO 565 defines the nominal top size as *“the smallest sieve from the top, in the range included in the R20 series such that not more than 5% of the material is retained”*.

The particle distribution is defined by fitting the PSD to the Rosin-Rammler equation (Rosin & Rammler, 1933). In this approach, the complete range of particle sizes is divided into a set of discrete size ranges.

The Rosin-Rammler equation, predicts the mass fraction R of particles having a size greater than the diameter D as:

$$R = e^{-\left(\frac{D}{D_n}\right)^n} \quad [1]$$

Where, R is the cumulative % retained at a size D and D_n and n are the regression fitting parameters. The slope and intercept of the regression are calculated so that the nominal top size can be estimated from the resultant Rosin-Rammler plot.

Therefore:

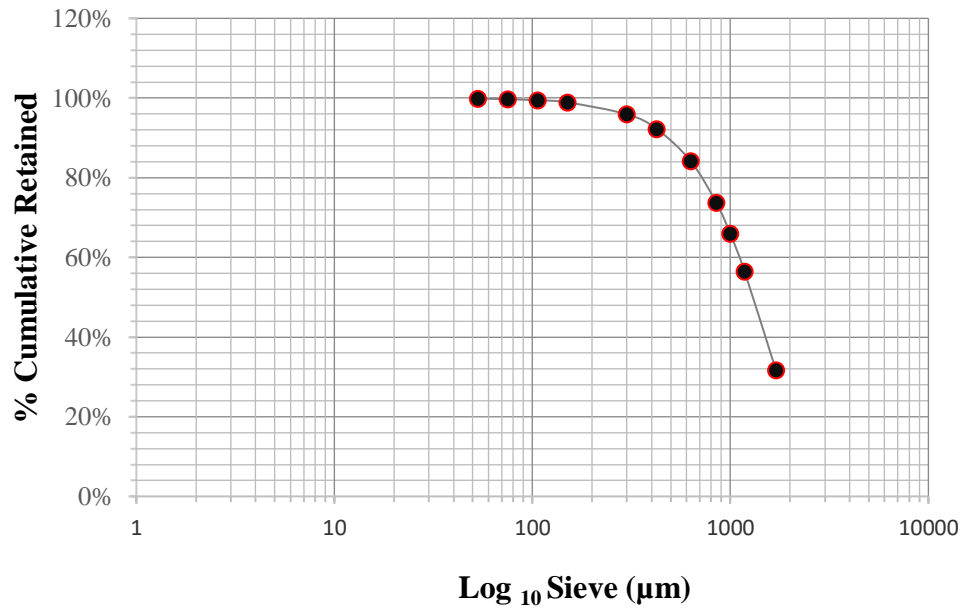


Figure 1. Rosin-Rammler regression for a sample with a predicted NTS of 2273 µm. The x-axis is log₁₀ of sieve size in µm and the y-axis is arithmetic.

References

- Afewu, K. I., Lewis, G. O., (1998). Sampling a run-of-mine mill feed – a practical approach, *Journal of the Southern African Institute of Mining and Metallurgy*, 98, pp. 299-304.
- Rosin, P. and Rammler, E., (1933). The Laws Governing the Fineness of Powdered Coal, *J. Inst. Fuel*, Vol.7., No. 31, pp.29-36.