

CALCULATION COVER SHEET**Date:** 28-Nov-06**Author:** Alex Doll**Project:** General engineering**Calc No:****Title:** Deriving general fitting equations for Rosin-Rammler formula for 2-point casePurpose:

Fitting a 2-value data set to a Rosin-Rammler formula.

Method:

The general form of the Rosin-Rammler equation is:

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

where: R is the %retained at a size D , and both D_n and n are fitting parameters.Given two points, R_1 retained at size D_1 and R_2 retained at size D_2 , the two fitted parameters may be determined as follows:

$$D_n = \exp\left(\frac{\ln\left(\ln\left(\frac{1}{R_1}\right)\right) \times \ln(D_2) - \ln\left(\ln\left(\frac{1}{R_2}\right)\right) \times \ln(D_1)}{\ln\left(\frac{\ln\left(\frac{1}{R_1}\right)}{\ln\left(\frac{1}{R_2}\right)}\right)}\right) \quad \text{and} \quad n = \frac{\ln\left(\ln\left(\frac{1}{R_1}\right)\right)}{\ln\left(\frac{D_1}{D_n}\right)}$$

Once fitted, the %retained R at any size D can be estimated from the general form of the equation:

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

and any size D that sees a %retained R can be determined by:

$$D = \sqrt[n]{\ln\left(\frac{1}{R}\right) \times D_n^n} \quad \text{or, rearranged as} \quad D = \left[\ln\left(\frac{1}{R}\right) \times D_n^n\right]^{1/n}$$

Disclaimer: USE AT YOUR OWN RISK.

The author will not accept any responsibility for loss or damage caused by use of these formulae. The equations have not been tested under stringent conditions that allow them to be considered robust enough for Engineering use. People using this method must themselves accept responsibility to confirm that results are correct and applicable to the application being calculated.

Comments welcome: alex.doll@agdconsulting.ca