Pulverised Coal Fineness (Rosin–Rammler)

Rosin–Rammler size distribution of pulverised coal from two sieve results (such as 200 and 50 mesh), and the share passing any other sieve size.

Method: Rosin and Rammler (1933); The laws governing the fineness of powdered coal; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
First sieve aperture	75.000	µm
Share passing the first sieve	70.000	%
Second sieve aperture	300.00	µm
Share passing the second sieve	98.500	%
Sieve aperture wanted	150.00	µm

Calculated results

Parameter	Value	Unit
Share passing the sieve wanted	89.446	%
Uniformity (spread) index	0.90124	
Characteristic size (36.8 % retained)	61.039	µm

Formula and method

$$R(d) = \exp\left[-\left(\frac{d}{d'}\right)^{n}\right] \qquad P = 1 - R \qquad n = \frac{\ln(-\ln R_2) - \ln(-\ln R_1)}{\ln d_2 - \ln d_1}$$

$$d' = \exp\left[\ln d_1 - \frac{\ln(-\ln R_1)}{n}\right], \quad P_3 = 1 - \exp\left[-\left(\frac{d_3}{d'}\right)^{n}\right]$$

Variables

d_1	first sieve aperture	m
P_1	share passing the first sieve	–
d_2	second sieve aperture	m
P_2	share passing the second sieve	–
d_3	sieve wanted	m
P_3	share passing the sieve wanted	–
n	uniformity index	–
d'	characteristic size	m
R	share retained, 1 − P	–
d	particle size	m
P	share passing	–

Method and standards

Rosin–Rammler distribution fitted through two sieve points.

Assumptions and limits

- Rosin–Rammler fits typical PF; the fit passes exactly through the two points.
- A sieve outside the two measured ones is extrapolated; a warning appears.

References

• Rosin and Rammler (1933)

- The laws governing the fineness of powdered coal
- Journal of the Institute of Fuel 7

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/boilers-power-plant/fuel-ash-handling/coal-fineness-rosin-rammler

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.