Fineness Modulus of Aggregate from a Sieve Analysis

Fineness modulus of fine or coarse aggregate from the mass retained on the standard sieves, with the cumulative percentages retained and passing.

Method: Fineness modulus as the sum of cumulative percentages retained on the standard sieves divided by 100 (ASTM C125 definition; IS 383 sieve series with 10 mm, where the ASTM series uses 9.5 mm)

Input parameters

Unit system: SI

Parameter	Value	Unit
Mass retained on 10 mm (all coarser material counted here as one sieve)	0	g
Mass retained on 4.75 mm	20.000	g
Mass retained on 2.36 mm	60.000	g
Mass retained on 1.18 mm	100.00	g
Mass retained on 600 µm	200.00	g
Mass retained on 300 µm	320.00	g
Mass retained on 150 µm	220.00	g
Mass retained on the pan	80.000	g

Calculated results

Parameter	Value	Unit
Total mass	1,000.0	g
Fineness modulus (sum of cumulative % retained / 100)	2.2800	
Passing 600 µm	62.000	%

Notes for this case

- Uses the 10 mm to 150 µm sieves for sand; the pan is not counted.

Formula and method

$$FM = \frac{1}{100} \sum_{\text{sieves}} \text{cumulative } \%\text{retained}$$

Variables

m_1	Mass retained on 10 mm (all coarser material counted here as one sieve)	kg
m_2	Mass retained on 4.75 mm	kg
m_3	Mass retained on 2.36 mm	kg
m_4	Mass retained on 1.18 mm	kg
m_5	Mass retained on 600 µm	kg
m_6	Mass retained on 300 µm	kg
m_7	Mass retained on 150 µm	kg
m_8	Mass retained on the pan	kg
M	Total mass	kg
FM	Fineness modulus (sum of cumulative % retained / 100)	-
P_{600}	Passing 600 µm	-

Method and standards

Definition.

Assumptions and limits

- Standard sieve series 10 mm to 150 µm (IS sizes; the ASTM series uses 9.5 mm in place of 10 mm).
- Material on the 10 mm sieve is counted once; for coarse aggregate the larger standard sieves (80, 40, 20 mm) each add their cumulative percentage and must be added by hand.

References

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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/civil/concrete/fineness-modulus

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Reopens the calculator with the inputs of this report.