Concrete Target Mean Strength and Characteristic Strength from Tests

Target mean strength for a mix design from the characteristic strength and standard deviation, and the characteristic strength achieved by a set of test results.

Method: Statistical basis of characteristic strength

Input parameters

Unit system: SI

Parameter	Value	Unit
Characteristic strength required	30.000	MPa
Assumed standard deviation	5.0000	MPa
Statistical factor (1.65 for 5 % below)	1.6500	
Mean of test results	37.500	MPa
Standard deviation of test results	4.2000	MPa

Calculated results

Parameter	Value	Unit
Target mean strength	38.250	MPa
Characteristic strength from tests	30.570	MPa
Margin over requirement	0.57000	MPa
Expected share below f_ck from the tests	3.7073	%

Notes for this case

- f_t = f_ck + k·s; from tests f_c,k = mean − k·s_m, assuming normally distributed results. Codes add acceptance rules on individual results and set minimum margins when few results exist.

Formula and method

$$f_t = f_{ck} + ks, \quad f_{c,k} = \bar{f} - ks_m$$

Variables

f_{ck}	Characteristic strength required	Pa
s	Assumed standard deviation	Pa
k	Statistical factor (1.65 for 5 % below)	-
$\bar{f}$	Mean of test results	Pa
s_m	Standard deviation of test results	Pa
f_t	Target mean strength	Pa
$f_{c,k}$	Characteristic strength from tests	Pa
$f_{c,k} - f_{ck}$	Margin over requirement	Pa
p	Expected share below f_ck from the tests	-

Method and standards

Characteristic strength.

Assumptions and limits

- Normal distribution of strengths.

References

Statistical basis of characteristic strength

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/concrete-target-mean-strength

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.