



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 50107-2010

Replacing GBJ 107-1987

**Standard for evaluation of concrete compressive strength
(English Translation)**

Issued on: May 31, 2010

Implemented on: December 1, 2010

**Issued by: Ministry of Housing and Urban-Rural Development of the
People's Republic of China;
General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

- 1 General
- 2 Terms and symbols
 - 2.1 Terminology
 - 2.2 Symbols
- 3 Basic Regulations
- 4 Sampling and testing of concrete
 - 4.1 Sampling of concrete
 - 4.2 Fabrication and maintenance of concrete specimens
 - 4.3 Tests on concrete specimens
- 5 Inspection and evaluation of concrete strength
 - 5.1 Evaluation of statistical methods
 - 5.2 Evaluation by non-statistical methods
 - 5.3 Qualification assessment of concrete strength

1 General

1.0.1

This standard is formulated in order to unify the inspection and evaluation methods of concrete strength and ensure that the concrete strength meets the requirements of concrete engineering quality.

1.0.2

This standard applies to the inspection and evaluation of concrete strength.

1.0.3

The inspection and evaluation of concrete strength shall not only comply with this standard, but also comply with the current relevant national standards.

2.1.1 Concrete

It is an engineering material made of cement, aggregate and water according to a certain ratio, and hardened by mixing, molding, curing and other processes.

2.1.2 Age of concrete

The time, in days or hours, that concrete has experienced since the addition of water and mixing.

2.1.3 Strength of concrete

The mechanical properties of concrete represent its ability to resist external forces. Concrete strength in this standard refers to the concrete cube compressive strength.

2.1.4 Conformity assessment evaluation of conformity

The determination of whether the concrete strength is qualified or not according to certain rules.

2.1.5 Inspection batch inspection batch

Concrete aggregate consisting of concrete meeting the specified conditions and used for conformity assessment.

2.1.6 Inspection period

Statistical period specified for determining the standard deviation of the strength of an inspection lot of concrete.

2.1.7 Sample size sample size

The number of groups of concrete specimens used for conformity assessment representing the inspection lot.

2.2 Symbols

m_{fcu} --the average value of the compressive strength of concrete cubes in the same inspection batch;

$f_{cu,k}$ --standard value of concrete cube compressive strength;

$f_{cu,min}$ --the minimum value of the compressive strength of concrete cubes in the same inspection batch;

s --Standard deviation of the compressive strength of concrete cubes of the same inspection batch in the evaluation method with unknown standard deviation;

σ_0 --in the evaluation method with known standard deviation, the standard deviation of the compressive strength of concrete cubes in inspection batches;

$\lambda_1, \lambda_2, \lambda_3, \lambda_4$ --conformity assessment coefficients;

$f_{cu,i}$ —the representative value of the cube compressive strength of the i -th group of concrete specimens;

n - sample size.

3 Basic Regulations

3.0.1

The strength grade of concrete shall be divided according to the standard value of cubic compressive strength. The strength grade of concrete shall be represented by the symbol C and the standard value of cubic compressive strength (in N/mm^2).

3.0.2

The standard value of cubic compressive strength shall be a value in the overall distribution of concrete compressive strength measured by standard test methods at the age of 28 days for a cube specimen with a side length of 150mm manufactured and maintained according to standard methods. The probability of being below that value should be 5%.

3.0.3

Concrete strength should be inspected and evaluated in batches. The concrete of an inspection batch shall be composed of concrete with the same strength grade, the same test age, and basically the same production process conditions and mix ratio.

3.0.4

The strength of concrete produced in large quantities and continuously shall be evaluated according to the statistical method specified in Section 5.1 of this standard. The strength of concrete produced in small batches or sporadically should be assessed by the non-statistical method specified in Section 5.2 of this standard.

4.1 Sampling of concrete

4.1.1

For the sampling of concrete, it is advisable to formulate the division plan of the inspection lot and the corresponding sampling plan according to the requirements of the inspection and evaluation method specified in this standard.

4.1.2

Concrete strength samples should be randomly selected at the place where the concrete is poured.

4.1.3

The sampling frequency and quantity of test pieces shall meet the following requirements.

1 For every 100 trays, but no more than 100m³ of concrete with the same mix ratio, the

sampling frequency should not be less than once;

2 When the concrete with the same mix ratio is mixed in each working shift, the sampling frequency should not be less than once when there are less than 100 trays and 100m³;

3 When the concrete with the same mix ratio for one continuous pouring exceeds 1000m³, sampling should not be less than once for every 200m³;

4 For building buildings, each floor and concrete with the same mix ratio shall be sampled no less than once.

4.1.4

The total number of test specimens that should be made for each batch of concrete samples, in addition to meeting the number of groups necessary for the concrete strength assessment specified in Chapter 5 of this standard, should also be reserved for the inspection of the concrete strength of the structure or component during the construction stage. of test pieces.

4.2 Fabrication and maintenance of concrete specimens

4.2.1

At least one set of standard curing test pieces shall be prepared for each sampling.

4.2.2

Each group of 3 test pieces shall be made by sampling the concrete from the same plate or the same vehicle.

4.2.3

The molding method and standard curing conditions of the concrete specimens used for testing and evaluating the strength of concrete shall comply with the current national standard GB/T 50081 "Standards for Test Methods of Mechanical Properties of Ordinary Concrete".

4.2.4

For components that are cured by steam, the test pieces should be cured under the same conditions as the components first, and then placed under standard curing conditions for further curing. The sum of the two curing periods should be the age specified in the design.

4.3 Tests on concrete specimens

4.3.1

The cubic compressive strength test of concrete specimens shall be carried out in accordance with the provisions of the current national standard "Standard for Test Methods of Mechanical Properties of Ordinary Concrete" GB/T 50081. The determination of the