



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

GB/T 8077-2023

Methods for testing uniformity of concrete admixtures

混凝土外加剂匀质性试验方法

Issued on: December 28, 2023

Implemented on: July 1, 2024

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

GB/T 8077-2023 describes the Chinese methods for testing the uniformity of concrete admixtures, which is to say the tests that establish whether the drum delivered today is the same material as the one tested at approval. It is the routine quality control document of the admixture industry: solid content, density, chloride ion content, total alkali content, sulfate content, pH, fineness, moisture content, reducing sugar, cement paste fluidity and the surface tension and foaming characteristics, each with its apparatus, procedure, calculation and precision, expressed through repeatability and reproducibility conditions. It applies to high performance, high efficiency and normal water reducing admixtures, air entraining type water reducers, pumping agents, early strength agents, retarders, air entraining agents, waterproofing agents, antifreeze admixtures, flash setting admixtures and expansive agents. The 2023 edition takes effect on 1 July 2024. For a producer, a ready-mix plant or a testing laboratory, these are the methods a dispute is settled by.

This Document describes the test methods for the uniformity of concrete admixtures. This Document applies to high-performance water-reducing agents, high-efficiency water-reducing agents, ordinary water-reducing agents, air-entraining water-reducing agents, pumping agents, early-strength agents, retarders, air-entraining agents, waterproofing agents, antifreeze agents, accelerating agents, and expanding agents.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB 175 Common Portland cement

GB/T 2419 Test method for fluidity of cement mortar

GB/T 6005 Test sieves - Metal wire cloth, perforated metal plate and electroformed sheet - Nominal sizes of opening

GB/T 6682-2008 Water for analytical laboratory use - Specification and test methods

GB/T 8075-2017 Terms of concrete admixtures

GB/T 17671 Test method of cement mortar strength (ISO method) JC/T 681 Mixer for mixing mortars JC/T 729 Mixer for cement paste

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 8075-2017 and the following apply.

3.1 Repeatability conditions Test conditions in which the same object is tested independently by the same operator using the same equipment and following the same test method within a short period of time in the same laboratory. [Source: GB/T 8075-2017, 6.7]

3.2 Reproducibility conditions Test conditions conducted independently on the same test object in different laboratories by different operators using different equipment, following the same test method. [Source: GB/T 8075-2017, 6.8]

3.3 Repeatability limit A given numerical value, under repeatability conditions (3.1), has a 95% probability that the absolute difference between two test results is less than or equal to this value. [Source: GB/T 3358.2-2009, 3.3.9]

3.4 Reproducibility limit A given numerical value, under reproducibility conditions (3.2), has a 95% probability that the absolute difference between two test results is less than or equal to this value. [Source: GB/T 3358.2-2009, 3.3.14]

4.1 Number of tests and requirements

4.1.1 Each determination shall be tested twice. The absolute difference between the two results shall be within the repeatability limit; and the average of the two test results shall be used to represent the determination result. If the absolute difference between the two results exceeds the repeatability limit, a third determination shall be performed within a short period of time. Data exceeding the repeatability limit shall be discarded, and the average of the remaining two data shall be taken. If the third data is in the middle of the two values, the average of the three results shall be used to represent the determination result. If the deviation of all three determination results exceeds the repeatability limit, the test shall be repeated. Exceptions apply where otherwise specified.

4.1.2 For routine production control analysis, each determination may be tested only once.

4.1.3 The water used in this Document shall be no lower than the requirements of Grade III water specified in GB/T 6682-2008, except for cement paste fluidity and water reducing rate of cement mortar.

4.2 Blank test Using the same amount of reagent, without adding the specimen, the test shall be performed according to the same determination procedure; and the obtained determination results shall be corrected.

4.3 Ignition Place the filter paper and precipitate into a pre-ignited and constant-weight crucible. To avoid flame formation, slowly dry and ashed the precipitate in an oxidizing atmosphere until no black carbon particles remain. Then, place the crucible in a high-temperature furnace and ignite it at the specified temperature.

4.4 Constant mass After the first ignition or drying, cooling, and weighing, check for constant mass by repeatedly igniting or drying for 30 min each time, followed by cooling and weighing. Constant mass is achieved when the difference between two consecutive weighings is less than 0.0005 g.

4.5 Check for chloride ions (Cl^-) (silver nitrate inspection) After washing the precipitate several times as prescribed, rinse the lower end of the funnel with a few drops of water. Wash the filter paper and precipitate with a few milliliters of water. Collect the filtrate in a test tube; add a few drops of silver nitrate solution (5 g/L); and observe whether the solution becomes turbid. If turbid, continue washing and testing until the solution is no longer turbid when tested with silver nitrate.

4.6 Reagent requirements

4.6.1 All reagents shall be no lower than analytically pure (unless otherwise specified). Reagents used for calibration shall be primary reagents.

4.6.2 For acids or ammonia specified no concentration in this Document, it refers to commercially available concentrated acids or concentrated ammonia.

4.6.3 The degree of dilution of reagents is expressed as a volume ratio. For example, ammonia (1+3) means a mixture of 1 volume of concentrated ammonia and 3 volumes of water.

4.6.4 The shelf life of standard titration solutions is no more than 6 months when sealed, and no more than 2 months after opening.

4.7 Data processing requirements Density and chloride ion calculation results shall be retained to three digits after the decimal point; pH and surface tension calculation results shall be retained to one digit after the decimal point; paste flowability calculation results shall be accurate to 1 mm; all other calculation results shall be retained to two digits after the decimal point, unless otherwise specified.