



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

GB 31604.1-2023

**National food safety standard - General rules for migration test
of food contact materials and products**

食品安全国家标准 食品接触材料及制品迁移试验通则

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Foreword

This document was issued on 6 September 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 6 September 2024.

It is a GB standard without the /T suffix: compliance is mandatory in China.

1 Scope

GB 31604.1-2023 is the general rule that governs how migration from a food contact material or article is tested: what a migration test is, the basic requirements for running one, how a food simulant is chosen for the food the article is meant to hold, how the time and temperature of the test are selected, screening methods for overall migration, chemical solvent substitution for foods containing oil, correction of the result, and which of several results is taken as the answer. An annex maps food categories to simulants. The rules sit in one document because a migration figure has no meaning without them. The same plastic cup releases quite different amounts into water, into an acidic simulant and into ethanol, and different amounts again cold and at hot-fill temperature, so two laboratories can test the same article honestly and report incomparable numbers. The correction rules matter for the same reason: the ratio of contact area to food volume in a test cell is rarely the ratio in real use. For articles meant to be reused, the third of three successive tests is taken, because release falls with each contact and the first would overstate what a consumer is exposed to over the article's life. Testing laboratories, packaging and tableware

manufacturers, importers and regulators use it, and it is mandatory.

This document specifies the terms and definitions, basic requirements, selection of food simulants, selection of migration testing conditions, screening methods, chemical solvent substitution test, migration testing result correction and migration testing result selection of various food contact materials and products.

2 Terms and definitions

2.1 Migration testing

Migration testing refers to a test conducted under specified conditions to determine the amount of migration of components of food contact materials and products into test medium such as food or food simulants in contact with them. Migration testing includes specific migration testing, total migration testing and chemical solvent substitution test.

2.2 Food simulant

Food simulant is a test medium used to simulate food for migration testing. It can closely reflect the migration of components in food contact materials and products into the food in contact with them, and has the typical common characteristics of certain types of food.

2.3 Screening method

It is a method that uses the amount used, total migration amount or residue amount to screen for specific migration (total) amount, so as to verify the compliance of a specific migration (total) amount of a certain (category) substance in food contact materials and products.

2.4 Chemical solvent substitution test

A migration testing conducted under specified conditions using chemical solvents to replace oily food simulants.

2.5 Reusable food contact materials and products

Food contact materials and products that have been or are expected to be used multiple times and come into repeated contact with food.

3 Basic requirements

3.1 To measure the total migration amount of food contact materials and products, food simulants shall be selected and migration testing shall be conducted in accordance with the provisions of this Standard.

3.2 Regarding the determination of the specific migration (total) amount of food contact materials and products, for materials and products that have been in contact with food, the food in contact with them shall be directly tested, or materials and products that have not been in contact with food shall be selected to use food simulants for migration testing. For materials and products that have not come into contact with food, food or food simulants shall be selected for testing.

3.3 Food simulants and migration testing conditions shall reflect actual use situations as closely as possible. When food contact materials and products have clear intended use conditions, the most stringent test conditions (the conditions that result in the highest migration amount) shall be selected based on the expected use conditions. When the most severe test conditions cannot be determined, all conditions corresponding to the actual usage conditions shall be selected for testing. When there are no clear intended use conditions for food contact materials and products, the most stringent test conditions supported by scientific evidence shall be selected.

3.4 The migration testing shall not cause the test sample to undergo changes in physical properties or other changes (such as deformation, melting, etc.) that would not occur under normal use conditions. If the above changes occur during the migration testing, test conditions that are no lower than the actual contact conditions or other food simulants with scientific evidence shall be selected for the migration testing.

3.5 For migration testing, the final product (or sheet or specimen) shall be selected for migration testing. For food contact materials (such as resin or granules, coatings, inks, adhesives, etc.) that are significantly different from actual molded products, the final product (or sheet, specimen) shall be made into a migration testing according to the actual processing conditions. The specific requirements of the final product (or sheet or

specimen) shall comply with the provisions of GB 5009.156 and other national food safety standards.

3.6 When conducting migration testing on multi-material food contact materials and products, the migration testing can be conducted on the entire final product or on each material separately.

3.6.1 When conducting migration testing on composite materials and finished products, and coated finished products as a whole, the selection of food simulants and migration testing conditions shall be carried out in accordance with the provisions of the national food safety standards for materials in direct contact with food layers. For items to be tested that only come from non-direct food contact layers, the selection of food simulants and migration testing conditions can be carried out in accordance with the provisions of the national food safety standards for the materials of this layer. When conducting migration testing on combined materials and finished products as a whole, the most stringent migration testing conditions shall be selected according to the product instructions or the use conditions of all parts that may come into contact with food.

3.6.2 When conducting migration testing on each material of multi-material food contact materials and products, the migration testing shall be conducted separately in accordance with the provisions of the national food safety standards for the corresponding materials.

3.7 If national food safety standards have special provisions for migration testing, those provisions shall be followed.

4 Selection of food simulants

4.1 General requirements for food simulant selection

4.1.1 When food contact materials and products are expected to come into contact with a certain type of food (for example, acidic food), the corresponding food simulant shall be selected according to the type of food expected to come into contact for specific migration testing and total migration testing.