China – Release a Series of GB Standards for Food Contact Materials

TÜV Rheinland LGA Products – Information October 2023

On September 25th 2023, National Health Commission (NHC) of the People's Republic of China published a series of GB standards for food contact materials (FCMs) in Announcement No. 6 of 2023. It includes GB standards for test methods, such as GB 31604.1-2023 (general principles for migration testing), as well as GB standards for different types of FCMs. There are two newly added standards in GB 4806 series, which are GB 4806.13-2023 for composite materials and articles and GB 4806.14-2023 for food contact use printing inks. Furthermore, there are three new versions of GB 4806 standards. They are GB 4806.7-2023, GB 4806.9-2023 and GB 4806.11-2023, which replace the 2016 version of GB standards for plastic, metal and rubber FCMs, respectively. The implementation date is 6th September 2024 for GB standards of these five types of FCMs and GB 31604.1-2023. Further information about these six GB standards will be explained below.

GB 4806.7-2023 (PLASTIC MATERIALS AND ARTICLES)

GB 4806.7-2023 replaces the two GB standards - GB 4806.6-2016 (plastic resins for food contact) and GB 4806.7-2016 (plastic materials and articles for food contact). In addition, this 2023 version also includes plastic resins that have been approved for food contact in the previous relevant NHC announcements. Please see below for some important updates:

- Scope
  - This GB standard is also applicable to starch-based plastic materials and articles.
- Raw material requirements
  - The use of additives (including plant fibre fillers) should comply with the provisions of GB 9685 and relevant announcements.
  - The starch used in starch-based plastic materials and articles for food contact should be edible starch or modified starch. For edible starch, it should comply with the provision of GB 31637. For modified starch, it should be approved for use in GB 2760 and relevant announcements, and its quality specification should comply with the corresponding national food safety standards.
- Physical and chemical indicators
  - Specific migration of primary aromatic amines (PAAs) is newly added with specific migration limit (SML) of "not detectable". This test is only applicable to plastic materials and articles containing aromatic isocyanates, azo colorants and other substances that may produce PAAs.

- For starch-based plastic materials and articles with starch content ≥ 40%, potassium permanganate consumption is not required. Besides, if the test result of overall migration exceeds the limit, further chloroform extraction can be done and the result will be judged based on the chloroform extract.

GB 4806.9-2023 (METAL MATERIALS AND ARTICLES)

GB 4806.9-2023 replaces GB 4806.9-2016 for metal materials and articles. Please see below for some important updates:

- Terms and definitions
  - Two new terms “alloy elements” and “impurity elements” are added.
- Raw material requirements
  - Metal base materials and metal platings used on food contact surface should not use lead, cadmium, arsenic, mercury, antimony, beryllium and lithium as alloy elements. Their impurity element content should meet the requirement stipulated in Table 1 of GB 4806.9-2023.
- Physical and chemical indicators
  - The 2023 version has a different set of specific release limits (SRLs) compared to the 2016 version. Metal materials and articles should comply with the SRLs set out in Table 3 (for impurity elements) and Table 4 (for alloy elements) of GB 4806.9-2023.
  - The SRL of tin specified in Table 4 is not applicable to tin-plated steel containers.
- Other technical requirements
  - The release of tin from tin-plated steel containers into foodstuffs should comply with the requirements of GB 2762 and the corresponding national food safety standards.
- Migration test
  - For metal materials and articles intended for repeated use, they should undergo three migration tests in accordance with GB 31604.1.
    - For stainless steel, the compliance is established on the results from the third test. However, if the result is pass in the first test and there is evidence that the migration results of subsequent tests will not increase, then subsequent tests are not required.
    - For metals other than stainless steel, it will be deemed fail if any one of the three tests exceeds the limits.
- Annex A
  - This section contains the list of test food simulants and migration test conditions that slightly differ from the 2016 version.

GB 4806.11-2023 (RUBBER MATERIALS AND ARTICLES)

GB 4806.11-2023 replaces GB 4806.11-2016 for rubber materials and articles. In addition, this 2023 version also includes basic raw materials for rubber that have been approved for food contact in the previous relevant NHC announcements. Please see below for some important updates:

- Scope
  - The 2023 version removes silicone from the scope.
- Physical and chemical indicators
  - Specific migration of primary aromatic amines (PAAs) is newly added with specific migration limit (SML) of “not detectable”. This test is only applicable to rubber materials and articles containing amine antioxidants, sulfenamide vulcanization accelerators, azo colorants and other substances that may produce PAAs.
  - Specific migration of N-nitrosamines and N-nitrosatable substances is newly added. This test is only applicable to rubber materials and articles containing vulcanization accelerators and other substances that may produce N-nitrosamines and N-nitrosatable substances.
- Migration test
  - For fatty foodstuffs, vegetable oil should be selected as food simulant in accordance with GB 31604.1. However, if this is technically not feasible to perform tests in vegetable oil, then 50% ethanol can be used for testing. In case of using 50% ethanol, correction factor for fatty foods and fatty food simulant are not applicable.
  - When testing potassium permanganate consumption on repeated use rubber materials and articles, the compliance is established on the results from the third test. However, if the result is pass in the first test and there is evidence that the migration results of subsequent tests will not increase, then subsequent tests are not required.

GB 4806.13-2023 (COMPOSITE MATERIALS AND ARTICLES)

GB 4806.13 replaces GB 9683-1988 (hygiene standard for composite food packaging bags) and is newly added in GB 4806 series. Please see below for some noteworthy points related to this GB standard:

- Composite materials and articles used for food contact should comply with GB 4806.1.
- Raw material requirements
  - For each layer of food contact composite materials and articles, the basic resins, additives and other raw materials used should comply with the corresponding national food safety standards and relevant announcements.
- Sensory requirements
  - It should comply with the sensory requirements specified in the national food safety standard of the direct food contact layer material.

- Physical and chemical indicators
    - Composite materials and articles for food contact should comply with the physical and chemical indicators specified in the national food safety standards corresponding to each layer of materials. When there is the same test item, the limit should be determined in accordance with the provisions of GB 4806.1. However, for overall migration, potassium permanganate consumption, heavy metal (as lead) and decolorization, they should be carried out in accordance with the provisions of national food safety standard of direct food contact layer material.
    - Residue indicators and maximum residue levels only apply to that particular layer of materials.
- Microbial limits
    - Composite materials and articles for food contact (except with some special cases) should comply with the provision of GB 14934.

GB 4806.14-2023 (PRINTING INKS FOR FOOD CONTACT MATERIALS AND ARTICLES)

GB 4806.12-2023 is newly added for printing inks for food contact materials and articles. It divides printing inks into two groups – direct contact with foods and indirect contact with foods. Please see below for some noteworthy points related to this GB standard:

- Printing inks for food contact materials and articles should comply with GB 4806.1.
- The manufacture and printing process of printing inks should comply with the provision of GB 31603.
- Raw material requirements

	Printing inks for direct food contact	Printing inks for indirect food contact
Basic raw materials	• It should be approved for use in GB2760 and related announcements, and its quality specification should comply with the requirements of relevant standards.	• The use of colorants based on lead, mercury, cadmium, chromium (VI), arsenic, antimony, selenium or their compounds is not allowed; and the colorants used should comply with the purity requirements for colorants in GB 9685. • Basic raw materials should be those approved by national food safety standards for food contact application. • The basic raw materials that can be used in direct food contact printing inks can also be used in indirect food contact printing inks.
Additives	• It should be approved for use in GB2760 and related announcements, and its quality specification should comply with the requirements of relevant standards.	• It should comply with the requirements of GB 9685 and relevant announcements. • The additives that can be used in direct food contact printing inks can also be used in indirect food contact printing inks.

- Physical and chemical indicators
  - The heavy metal residues in printing inks should comply with the requirements set out in Table 2 of GB 4806.14-2023 using the test method specified in Annex A.

	Printing inks for direct food contact	Printing inks for indirect food contact
Heavy metal residues	Lead, mercury, cadmium, chromium and arsenic requirements set out in Table 2 of GB 4806.14-2023 using test method specified in Annex A	
Overall migration	≤ 10 mg/dm ² (or 60 mg/kg for children use FCMs)	These tests should be carried out in accordance with the provisions of national food safety standard of direct food contact layer material.
Potassium permanganate consumption	≤ 10 mg/kg	
Heavy metal (as lead)	≤ 1 mg/kg	
Specific migration of PAAs	not detectable (limit of detection = 0.01 mg/kg Only applicable to printing ink layers containing aromatic isocyanates and azo colorants and other substances that may produce PAAs. The test should be done on the final product of food contact materials and articles.	

GB 31604.1-2023 (GENERAL RULES FOR MIGRATION TESTING)

GB 31604.1-2023 replaces GB 31604.1-2015 the general rules for migration testing. The 2023 version improves the content by adding more details and clarification. Please see below for some noteworthy points related to this GB standard:

- The principle of selecting food simulants for dry food contact is added. When performing migration tests on materials and articles that come into contact with dry foods, the corresponding food should be used for testing. However, when testing in food is not feasible, then at least one food simulant shown in food simulants table can be selected for migration test.
- For specific migration test condition table, a migration test duration of 5 minutes has been added for food contact duration ≤ 5 minutes.
- For overall migration test condition table, a migration test condition of “40°C, 30 min” has been added for food contact at cold or ambient temperature for a short duration (≤ 30 minutes).
- Table A.1 for food categories and the corresponding food simulants assignment is updated. For example:
  - The fat reduction factor of fried tofu has been updated from 3 to 2.
  - 50% ethanol is assigned for soy milk instead of 20% ethanol.

The requirements listed above on the applicable GB standards are not exhaustive, please contact your local TÜV Rheinland contact to understand more about the changes in this update.

Further information on current legal changes can also be found on our homepage at www.tuv.com or https://www.tuv.com/regulations-and-standards/en/

Further technical information can be obtained from:

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