

ICS 83.080.20

CCS G32



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

GB/T 40006.1-2021

Plastics - Recycled plastics - Part 1: General rules

塑料 再生塑料 第1部分：通则

Issued on: May 21, 2021

Implemented on: December 1, 2021

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

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1 Scope

Part 1 of China's national standard series for recycled plastics, giving the general rules. It specifies the classification, the terms and definitions, and the requirements common to the whole series. The series exists because recycled plastic has been traded for decades without a specification, on visual inspection and trust, which is why it has been priced as a commodity discount rather than as a material with properties. The general rules establish what has to be declared about any recycled plastic: its polymer identity and how that was determined, its source and whether it is post-industrial or post-consumer, its processing history, the contaminants it may carry, and the property data that lets a converter judge whether it will run. Post-consumer material is the harder case and the one that matters environmentally, since post-industrial scrap was never waste in any real sense - it went straight back into the process that made it.

This document specifies the terms and definitions, classification and designation, requirements, test methods, and traceability document of recycled plastic. This document applies to recycled plastic particles made from waste thermoplastics as raw materials through processes such as screening, classification, cleaning, melt extrusion granulation (including granulation processes such as bracing, hot cutting and/or water cutting). This document also applies to polyethylene terephthalate (PET) bottle flakes. This document does not apply to recycled plastic from hazardous waste and radioactive waste such as medical waste, pesticide packaging.

2 Normative references

The contents of the following documents, through normative references in this text, constitute indispensable provisions of this document. Among them, for dated references, only the edition corresponding to that date applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1844.1-2008 Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics

GB/T 2035 Terms and definitions for plastics

GB/T 6040-2019 General rules for infrared analysis

GB/T 19466.2-2004 Plastics - Differential scanning calorimetry (DSC) - Part 2: Determination of glass transition temperature

GB/T 19466.3-2004 Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization

GB/T 30102 Plastics - Guidelines for the recovery and recycling of plastic waste

GB/T 37638 Determination of polybrominated biphenyls and polybrominated diphenyl ethers in plastic products - High performance liquid chromatography

GB/T 37639 Determination of polybrominated biphenyls and polybrominated diphenyl ethers in plastic products - Gas chromatography and mass spectrometry

GB/T 38287 Determination of hexavalent chromium in plastic materials

GB/T 38290 Determination of cadmium in plastic materials

GB/T 38291 Determination of lead in plastic materials

GB/T 38292 Determination of mercury in plastic materials

GB/T 38470-2019 Recycling materials for brass SN/T 2249 Determination of phthalates in plastics and plastic articles - Gas chromatography-mass spectrometry (GC-MS) method

3 Terms and definitions

The terms and definitions defined in GB/T 2035 and GB/T 30102 and the following one apply to this document.

3.1 Recycled plastic Plastic prepared by processing in a production process from plastics waste materials for the original purpose or for other purposes, but excluding energy recovery.

Note 1: In a broad sense, the recycling of plastics covers any re-use of scrap material or discarded articles, including pyrolysis to recover useful organic chemicals.

Note 2: Recycled plastics may or may not be reformulated by the addition of fillers, plasticizers, stabilizers, pigments, etc.

Note 3: Refer to Appendix A for terms related to recycled plastic in ISO 472:2013.

4 Classification and designation

4.1 General See Table 1 for the standard mode of designation of recycled plastic.

6.1.1.1 Glass jar: The volume of the glass jar is about 1 L, with a sealable lid. At room temperature and 80 °C, it is clean and odorless.

6.1.1.2 Thermostat: It shall have an air circulation system; be able to keep the temperature at $(80 \pm 2)^\circ\text{C}$ or $(60 \pm 2)^\circ\text{C}$.

6.1.1.3 Electronic balance. Accuracy is $\pm$

0.01 g.

6.1.2 Odor assessment team In order to obtain consistent data, the odor assessment team shall be composed of at least 3 people. Members of the odor assessment team must not have behaviors that affect the results of the odor assessment, such as smoking, using cosmetics, chewing gum, etc. After being determined, the members of the team shall remain unchanged. 3 h before the odor evaluation, members of the team shall not eat food with strong odor. People with cold and nasal congestion shall not participate in the odor evaluation.

5.2.1

b) of GB/T 6040-2019. The temperature and thickness for preparing the film are in accordance with the regulations of other parts of GB/T 40006. B.3 Test B.3.1 Transmission method Clamp the film sample prepared in B.2 on the sample holder. The sample is placed vertically in the main optical path of the infrared spectrometer. According to the regulations of other parts of GB/T 40006, collect the infrared absorption spectrum of the sample. If the spectrum occurs, in accordance with the provisions of

6.1.3 Test

6.1.3.1 Specimen preparation Weigh $(20 \pm 0.1)\text{g}$ of the sample. The size of the sample shall be smaller than the caliber of the jar.

6.1.3.2 Test procedure The odor test is carried out according to the following steps:

a) Adjust the temperature of the thermostat to 80 °C.

b) Place the specimen in a glass jar with a volume of about 1 L. Cover the bottle stopper and place it in the thermostat at $(80 \pm 2)^\circ\text{C}$ and keep it for $(120 \pm 10)\text{min}$.

c) Take out the glass jar with the specimen from the thermostat at $(80\pm 2)^{\circ}\text{C}$; cool it to $(60\pm 2)^{\circ}\text{C}$ and determine the odor.

d) The odor assessment team is composed of 3 inspectors. Each inspector independently determines the odor of the specimen. The lid shall not leave the glass jar for more than 5 s. After each inspector inhales the gas, the container shall be sealed in time. And place the glass jar in a thermostat at $(60\pm 2)^{\circ}\text{C}$ for at least 2 min before opening the specimen container again.

e) The odor level is divided into level 1 to level 6: Level 1: Odorless; Level 2: There is an odor, but no interfering or pungent odor; Level 3: There is an obvious odor, but no interfering or pungent odor; Level 4: There is interfering and pungent odor; Level 5: There is strong interfering and pungent odor; Level 6: There is an unbearable odor. At the same time, it is also allowed to be between the two evaluation levels. Take a half-point score level (such as level 3.5, level 4.5, etc.). If the identification results of 3 people differ by more than two levels, it is necessary to change the team of 5 people to smell and identify again.

f) The test result is expressed as the arithmetic mean of the assessment levels, accurate to one decimal place.

6.2.1 Heavy metal

6.2.1.1 The determination of hexavalent chromium content is carried out according to GB/T 38287.

6.2.1.2 The determination of cadmium content is carried out according to GB/T 38290.

6.2.1.3 The determination of lead content is carried out according to GB/T 38291.

6.2.1.4 The determination of mercury content is carried out according to GB/T 38292.

6.2.2 Polybrominated biphenyls and other organic matters The determination of polybrominated biphenyls and polybrominated diphenyl ethers shall be carried out according to the methods specified in GB/T 37638 or GB/T 37639. The determination of phthalate esters is carried out according to the method specified in SN/T 2249.

6.3 Radioactivity It shall be carried out according to the method specified in GB/T 38470-2019, Appendix B.

Appendix B

(Normative) Qualitative analysis of materials by infrared spectroscopy B.1 Sampling Randomly select 10 samples from a batch of recycled plastic products. Each shall not be less than 10 g. B.2 Specimen preparation B.2.1 Specimen preparation equipment Metal plate equipped with a temperature control unit. The temperature control range must include the melting temperature of the material specified in other parts of this document. A gasket