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**GB**

NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA

ICS 35.040

CCS A 24

**GB/T 23833-2022**

Replacing GB/T 23833-2009

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**Bar code for commodity - Numbering and symbol marking  
of assets**

商品条码 资产编码与条码表示

**Issued on: October 12, 2022**

**Implemented on: May 01, 2023**

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

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# Bar code for commodity - Numbering and symbol marking of assets

## 1 Scope

This document specifies the technical requirements for asset numbering, barcode representation, and barcode symbols.

This document applies to the identification, automatic identification, data collection of returnable assets, individual assets, assembly assets.

## 2 Normative references

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

GB/T 1988 Information technology - 7-bit coded character set for information interchange

GB 12904 Bar code for commodity - Retail commodity numbering and bar code marking

GB/T 12905 Bar code terminology

GB/T 15425 Bar code for commodity - 128 bar code

GB/T 16986 Bar code for commodity - Application identifier

GB/T 18284 Quick response matrix code

GB/T 18348 Bar code for commodity - Bar code symbol print quality verification

GB/T 21049 Han Xin code

GB/T 23704 Two-dimensional bar code symbol print quality test

GB/T 37056 Article numbering terminology

GB/T 40204-2021 General rules of two dimensional barcodes for traceability

GB/T 41208 Data matrix code

### 3 Terms and definitions

The following terms and definitions, as defined in GB/T 12905 and GB/T 37056, apply to this document.

#### 3.1

##### **Returnable asset**

The packaging, containers or transport equipment, etc., which have certain value and are reusable.

Note: Such as beer barrels, high-pressure gas cylinders, plastic pallets or crates, etc.

#### 3.2

##### **Individual asset**

A physical entity, which has specific properties.

Note: Such as aircraft parts, rolling stock, tractors, etc.

#### 3.3

##### **Individual asset of an assembly**

A single asset, which combines multiple parts, components (assemblies).

#### 3.4

##### **Global returnable asset identifier; GRAI**

In the commodity barcode system, a code that is used to uniquely identify returnable asset items on a global scale.

Note: It consists of manufacturer identification code, asset type code, check code, optional serial number.

[Source: GB/T 37056-2018, 3.10, modified]

#### 3.5

##### **Global individual asset identifier; GIAI**

In the commodity barcode system, a code that is used to uniquely identify a single asset on a global scale.

The rules for compiling the manufacturer identification code shall comply with the requirements of GB 12904.

#### **4.1.2.2 Asset type code**

The asset type code is compiled by the asset owner or manager, who has obtained the manufacturer identification code AND is guaranteed to be unique.

#### **4.1.2.3 Check code**

The check code is obtained, according to the calculation method in Appendix B, based on the first 13 digits of GRAI.

#### **4.1.2.4 Serial number**

The serial number is the responsibility of the asset owner or manager, who obtains the manufacturer identification code.

### **4.2 Global individual asset identifier**

#### **4.2.1 Code structure**

The global individual asset identifier (GIAI) consists of two parts: the manufacturer identification code and the individual asset reference code, which are code characters less than or equal to 30 characters. They are divided into four structures, as shown in Table 2. Among them, the manufacturer identification code consists of 7 ~ 10 digits; the individual asset reference code consists of 1 ~ 23 code characters. The coded character set is in accordance with Appendix A.

#### **4.2.2 Compilation rules**

##### **4.2.2.1 Manufacturer identification code**

The rules for compiling the manufacturer identification code shall comply with the requirements of GB 12904.

##### **4.2.2.2 Individual asset reference codes**

Individual asset reference codes are compiled by the asset owner or manager, who obtained the manufacturer identification code.

### **4.3 Individual asset codes for global assemblies**

#### **4.3.1 Code structure**

The structure of the individual asset codes for global assemblies (GIAI-ASSEMBLY) is the same as that in Table 2.

#### **4.3.2 Compilation rules**

##### **4.3.2.1 Manufacturer identification code**

The compilation rules for manufacturer identification code shall comply with GB 12904.

##### **4.3.2.2 Individual asset reference codes for assemblies**

See 4.2.2.2 for the compilation rules of individual asset reference codes for assemblies.

## **5 Barcode representation**

When the asset code is represented by a barcode, it shall be used together with the application identifier. The application identifier of the asset code is as shown in Table 3. The application identifier shall meet the requirements of GB/T 16986. The one-dimensional barcode adopts GS1-128 barcode, which shall meet the requirements of GB/T 15425. The two-dimensional code adopts two-dimensional code with GS1 mode, such as QR code, data matrix code, Han Xin code, which shall comply with the requirements of GB/T 18284, GB/T 41208, GB/T 21049. The data structure of the manufacturer-defined website is in accordance with the provisions of 5.5.1.2 and 5.5.2.2 in GB/T 40204-2021. The unit data string and analytical query keywords of the asset QR code are in accordance with Appendix A of GB/T 40204-2021.

## **6 Technical requirements for barcode symbol**

### **6.1 Requirements for size and level**

The size and level requirements for one-dimensional barcode symbol of assets are in accordance with Table 4. The size and level requirements for two-dimensional barcode

## Appendix B

### (Normative)

#### Calculation method of check code

##### B.1 Code position number

The code position serial number refers to the serial number from right to left, including the check code (the code position serial number of the check code is 1).

##### B.2 Calculation steps

The calculation steps of the check code are as follows:

- a) Starting from the code position number 2, sum all the digital codes of even digits;
- b) Multiply the sum of step a) by 3;
- c) Starting from code position number 3, sum up all the digital codes of odd digits;
- d) Add the results of step b) and step c);
- e) Subtract the unit digit of the result obtained in step d) from 10, as the check code (if the unit digit is 0, the check code is 0).

Example: For the 14-digit code 0690123456789X<sub>1</sub>, see Table B.1 for the calculation method of the check code.

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