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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 8559-2026

Replacing GB/T 8559-2008

Cold storage technology for apples

苹果冷藏技术

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 8559-2008 "Apple Refrigeration Technology". Compared with GB/T 8559-2008, the main differences are structural adjustments and editorial changes. Aside from the modifications, the main technical changes are as follows:

a) Harvesting and quality requirements have been changed (see Chapter 4,

3.1 of the.2008 edition);

b) The suitable harvest maturity index for some apple varieties has been changed (see 4.3,

3.1 in the.2008 edition);

c) The precooling technical requirements have been changed (see Chapter 5, Chapter 4 of the.2008 edition);

d) Packaging technical requirements have been changed (see Chapter 6,

3.3 of the.2008 edition);

e) The technical requirements for inbound stacking have been changed (see 7.2, Chapter 5 of the.2008 edition);

f) The cold storage conditions and expected storage time for some apple varieties have been changed (see 7.4,

6.2.1 in the.2008 edition);

g) The technical requirements for ventilation and air exchange in storage management have been revised (see 8.3,

6.3 in the.2008 edition);

1 Scope

GB/T 8559-2026 is the Chinese national standard covering keeping apples for months - the harvest maturity that determines how long a fruit will store, the cooling rate, the temperature and humidity by variety, the controlled atmosphere and the disorders that appear when any of it is wrong. It replaces GB/T 8559-2008 and has been in force since 1 October 2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 8559-2008. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the harvesting and quality requirements, pre-cooling, packaging, cold storage, storage management, warehousing, transportation and sales, and record keeping for apples under cold storage conditions. Recording requirements. This document applies to the cold storage and preservation of apples.

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Harvesting and Quality Requirements

4.1 Harvesting Time Harvesting is best done on sunny or cloudy days when temperatures are low, avoiding rainy, foggy, or dewy days. Stop fertilizing 2-3 weeks before harvesting. And watering.

4.2 Harvesting Methods Handle with care during harvesting to avoid mechanical damage. After harvesting, place the fruit in a cool, well-ventilated area and quickly move it to a pre-cooling environment, following the instructions... The provisions of NY/T 983 shall apply.

4.3 Harvesting maturity Apples should be harvested in batches at appropriate times, based on the characteristics of the apple variety, the growing environment, climate conditions, and storage time. Different apple varieties are suitable for harvesting. The maturity indicators should be implemented according to Table 1.

4.4 Quality Requirements Apples should be fresh and clean, possessing the inherent shape, color, and flavor of the variety, and free from mechanical damage, sunburn, hail damage, pesticide damage, cracking, pests, and diseases. Fruit surface defects meet the requirements for superior and first-class products as specified in GB/T 10651.

5 Pre-cooling

5.1 Apple precooling should preferably be done using cold storage precooling, differential pressure precooling, or water precooling.

5.2 Pre-cooling should be carried out within 24 hours after harvest, and the core temperature should be reduced to the suitable storage temperature within 48 hours. Pre-cooling should be carried out in accordance with the specifications of NY/T 4168. The decision will be made.

5.3 When using cold storage for pre-cooling, the daily inbound volume should be controlled at 8% to 15% of the storage capacity.

6.1 Packaging Materials

6.1.1 The outer packaging should be sturdy, with smooth inner walls and good ventilation and moisture-proof performance. Cardboard boxes, wooden boxes, plastic baskets, metal frames, etc. are recommended.

6.1.2 The inner packaging should be made of a material with high carbon dioxide permeability or with holes.

6.1.3 Packaging materials shall comply with the provisions of GB/T 34344.

6.2 Packaging Operation

6.2.1 Pre-cooled apples should be packaged in a clean environment at a low temperature of 0°C~10°C.

6.2.2 Apples should be packaged according to the same place of origin, the same harvest batch, the same variety, and the same grade and specifications.

7.1 Preparations before warehousing

7.1.1 Before storage, the warehouse, packaging containers, tools, etc. should be cleaned, disinfected and sterilized. After disinfection, ventilation should be carried out in a timely manner.

7.1.2 Before storing apples, the equipment should be inspected to ensure it is in normal operating condition. The cold storage should undergo slow, gradual cooling 2-3 days before the apples are stored. The temperature in the storage room was lowered to -2°C to 0°C.

7.2 Inbound Stacking

7.2.1 Pre-cooled apples should be stored in the warehouse in a timely manner.

7.2.2 Storage should be organized by variety, stacked separately, and graded, with a storage density of 250 kg/m^3 to 280 kg/m^3. The stacking arrangement and orientation should be clearly defined. The spacing between the stacks should be aligned with the direction of air circulation within the warehouse to prevent frost damage to fruits near the evaporator and cold air outlet.

7.2.3 The requirements for stacking goods at designated locations are as follows:

---0.2m~0.3m from the wall;

---0.5m~0.6m from the top;

---At least 1.5m away from the air cooler;

---Distance between stacks. 0.3m~0.5m;

---The width of the passageways inside the warehouse is 1.2m~1.8m;

---The height of the wooden (stone) pads at the bottom of the stack is 0.1m~0.2m.

7.3 Preservation Treatment For apples stored under medium to long-term cold storage, fumigation with 0.5 μL/L to 1.0 μL/L 1-methylcyclopropene (1-MCP) is recommended to aid preservation. Specific procedures... See Appendix A for details.

7.4 Refrigeration conditions Based on the physiological characteristics of different apple varieties, the refrigeration temperature and relative humidity were determined, along with the refrigeration conditions and expected storage time for different apple varieties. The procedure should be followed according to Table 2.

8.1 Temperature Management

8.1.1 The temperature inside the storage room should be uniform and stable, with temperature fluctuations less than or equal to 0.5°C, and maintained within the range specified for storage conditions.

8.1.2 Temperature changes inside the warehouse should be monitored and recorded regularly. Two to three temperature measurement points should be set up per 100 cubic meters, and the locations of these points should be representative. The thermometer should have a measurement error of less than 0.2°C and should be calibrated at least once a year.