NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

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Code for design of cold store

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1.0.1 This standard is formulated, in order to standardize and integrate the

technical requirements for design of cold store, guide the design of cold store, meet food refrigeration technology and hygiene requirements, achieve the goals of economical and reasonable, energy-saving, environmentally friendly, safe and reliable.

1.0.2 This standard is applicable to the newly-built, expanded, reconstructed

food cold store, which adopts the subcritical vapor compression direct refrigeration systems using ammonia, halogenated hydrocarbons and their mixtures, carbon dioxide as refrigerants, AND the indirect refrigeration systems using carbon dioxide, brine, etc. as refrigerating medium.

1.0.3 The cold store design shall be safe and reliable, energy-saving, environmentally friendly, economically reasonable, advanced and applicable.

1.0.4 The cold store design shall not only meet the requirements of this

standard, BUT also meet the requirements of relevant national standards.

2.0.1 Cold store

Storage buildings, which adopt artificial refrigeration AND have cold insulation functions, including storehouse, refrigerating machine rooms, power distribution rooms, etc.

2.0.2 Assembly cold store

The cold store, which adopts light-weight composite sandwich panels, such as metal surface insulation sandwich panels, as thermal insulation and envelope structures, AND is assembled on-site.

2.0.4 High rack cold store

The rack cold store, which has a rack height of more than 7 m AND adopts mechanized or automated control.

2.0.5 Storehouse

The main body of the cold store building and its supporting stairwells, elevator rooms, anteroom, other auxiliary rooms.

2.0.6 Anteroom

The passages, which are set up for the entry and exit of goods in the cold storage room, ice storage room, chilling room. It is divided into the temperature-controlled anteroom, which has artificial refrigeration and temperature reduction, AND non-temperature controlled anteroom, which has no artificial refrigeration and cooling.

2.0.9 Chilling room

The room, where the product is cooled.

2.0.10 Freezing room

The room, where the product is frozen.

2.0.11 Cold storage room

A room, which is used to store cold processed products.

2.0.12 Chilled food storage room

A room, which is used to store goods, at a temperature higher than freezing point AND lower than normal temperature.

3.0.1 The design scale of the cold store shall be calculated, based on the

nominal volume of the cold storage room or ice storage room. Those which has a nominal

volume greater than 20000 m3 shall be large-scale cold store. Those which has a nominal volume of 5000 m3 ~ 20000 m3 shall be medium-sized cold store.

3.0.2 The calculated capacity of the cold store, for directly stacking cold storage

items, can be calculated as follows.

3.0.7 The design temperature and relative humidity of the cold room shall be

determined, according to the cold storage process requirements of various foods.

3.0.9 The minimum spacing, between rooms using ammonia refrigeration

system, ammonia refrigeration equipment and pipes installed outdoors and civil buildings outside the plant area, shall not be less than 150 m.

4.1.3 The general layout of the cold store shall be a combination of short-term

and long-term, focusing on the short-term. Resources such as storehouse land, railway dedicated lines, water transport wharf, equipment pipelines, roads, carriage return yards, shall be planned as a whole, reasonably arranged, taking into account the needs of future expansion.

4.1.4 The vertical design of the general plan of the cold store shall meet the

following requirements.

4.1.5 The main roads in the storehouse area shall be paved with concrete or

asphalt pavements, which are suitable for vehicles.

4.1.8 When the storehouse covers an area larger than 1500 m2, fire lanes shall

be set, at least along the two long sides of the storehouse.

4.2.3 The partition wall, between the cold storage room and the anteroom or

closed platform, shall be a fire partition wall. The fire resistance rating of the fire partition wall shall not be less than 3.00 h.

4.2.4 When the assembly cold store is not equipped with the fire partition

wall, which is specified in clause 4.2.3 of this standard, the fire resistance grade, number of layers, area shall meet the requirements of Table 4.2.4.

4.6 Refrigerating machine room, electric substation and

control room

4.6.1 The refrigerating machine room, electric substation and control room shall

meet the following requirements.

4.6.2 In addition to the requirements of clause 4.6.1 of this standard, the

ammonia refrigerating machine room shall also meet the following requirements.

4.6.3 The ammonia refrigerating machine room shall have at least one long side

of the building, which is not adjacent to other buildings. It shall have external doors and windows, which can meet natural ventilation.

5.1.1 The cold room should adopt a reinforced concrete structure or a steel

structure. When it is a small cold room, the cold room may also adopt a masonry structure.

5.1.2 The design service life and safety grade of the cold store's structure shall

comply with the relevant provisions of the current national standard "Unified standard reliability design of building structures" GB 50068.

5.1.5 When a reinforced concrete structure is adopted for the cold room, the

maximum spacing between expansion joints should not be greater than 50 m.

Where there is sufficient basis or reliable measures, the maximum spacing of expansion joints can be appropriately increased.

5.1.7 When the cold room's attic roof adopts cast-in-place reinforced concrete

floor AND the distance, between the center lines of the opposite side columns, is greater than or equal to 30 m, the top of the side column and the roof beam should be hinged.

5.3.8 The load-bearing wall brick masonry of rooms, which is not higher than

0 °C, such as frozen food storage room, freezing room, ice storage room, shall use the sintered ordinary bricks, which have a strength grade of not lower than MU20.

6.2.1 The load calculation shall include the cooling equipment load of the cold

room AND the mechanical load of the refrigeration system. It should adopt the steady-state calculation method, which is corrected hourly or by engineering factors.