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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 13.110

C 68

GB 11341-2008

Replace GB 11341-1989

Safety rules for overhead chain conveyers

悬挂输送机安全规程

Issued on: December 11, 2008

Implemented on: October 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC;
Standardization Administration of PRC.**

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Safety rules for overhead chain conveyers

1 Scope

This standard specifies the safety technical requirements for the design, manufacture, installation, use, maintenance, and management of overhead chain conveyors.

This standard is applicable to general-purpose overhead chain conveyors, accumulation overhead conveyors, and ground chain conveyors; for monorail overhead trolley conveyors, this standard can be used for reference.

2 Normative references

The provisions in the following documents become the provisions of this standard through reference in this standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Part, however, parties who reach an agreement based on this standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies to this standard.

GB 2893 Safety colours

GB 2894 Safety signs and guideline for the use

GB 3836.15 Explosive atmospheres - Part 15: Electrical installations design, selection and erection

GB 3836.16 Explosive atmospheres -- Part 16: Electrical installations inspection and maintenance

GB 4053.1 Safety requirements for fixed steel ladders and platform - Part 1: Steel vertical ladders

GB 4053.2 Safety requirements for fixed steel ladders and platform - Part 2: Steel inclined ladders

GB 4053.3 Safety requirements for fixed steel ladders and platform - Part 3: Industrial guardrails and steel platform

GB 4053.4 Fixed steel industrial platform

GB/T 5972 Cranes - Wire ropes - Care and maintenance, inspection and discard

guards (guards, safety devices) shall be adopted.

4.3 For remaining dangers that cannot be eliminated or reduced by design, and for which the safety guards are ineffective or not fully effective, the operators shall be notified and warned by the information.

4.4 The parts of the overhead conveyor and the components that fix the overhead conveyor on the building shall meet the requirements of strength, rigidity, and stability.

4.5 During manufacture, installation, transportation, storage, and use, there shall be no dangers to the personnel, equipment, and environment.

5 Requirements for design, manufacture, and installation

5.1 The safety factor of a track shall not be less than 2, and the allowable deflection shall not be greater than 1/300 of the span. The allowable deflection of the track of a monorail overhead trolley conveyor shall not be greater than 1/400 of the span.

5.2 The safety factor of the tractive chain shall not be less than 10. The safety factor of the 6-inch tractive chain used in the steel and automobile industries shall not be less than 12. The electric heating hydraulic die forging process and pre-stretching process shall be used, the fracture load of the chain shall not be less than 500 kN, and the pre-stretching load shall not be less than 250 kN.

5.3 The safety factor of hanging plates and slings shall not be less than 5.

5.4 The safety factor of the main force-bearing parts of the carrying trolley shall not be less than 5.

5.5 The drop section shall be lifted by two wire ropes or chains, and buffer devices shall be provided at the ends. The safety factor calculated according to the rated load of each wire rope shall not be less than 7, and the safety factor of the chain shall not be less than 10. The fixing devices at the end of the hoisting wire ropes in the drop section shall have anti-loosening and self-tightening functions.

5.6 All starting and stopping devices shall be clearly marked and easily accessible. Emergency stop switches shall be installed on the line of an overhead conveyor, generally not less than one within a range of 30 m. Emergency stop switches shall be installed at operating stations, drop sections, and line turnings. Emergency stop switches shall be the safety color (red) and shall be able to be operated quickly and without danger at all control points, loading and unloading points.

5.7 The equipment shall be equipped with sound and light warning signals to warn other personnel to pay attention to safety before the equipment is started.

5.8 The drive device shall be equipped with an overload protection device. When the tension of the tractive chain exceeds 1.5 times the allowable value, the power supply of the motor shall be cut off. The adjustment method shall be marked on the product manual and the corresponding part of the equipment shall be marked.

5.9 The tensioning devices shall be equipped with limit travel switches to maintain proper tension and cut off the motor power when the tension exceeds the specified value range.

5.10 Safety Devices for Vertical Curves shall be installed on the upslope and downslope sections of a track. When chains are accidentally broken, chains or trolleys will be quickly jammed, and the motor power will be automatically cut off at the same time. The interval between Safety Devices for Vertical Curves shall meet the requirement that the drop is not more than 1.5 m.

5.11 In an accumulation overhead conveyor, push rods and carrying trolleys shall be reliably engaged. On the inclined section, if there are no components damaged, they shall not be able to be separated even by manual methods.

5.12 At the joints of the movable rail sections (such as drop sections or turnout devices) of an accumulation overhead conveyor and a monorail overhead trolley conveyor, safety devices that prevent the carrying trolleys from falling shall be installed.

5.13 Slings and carrying trolleys shall be connected reliably and shall not be disengaged by themselves. Slings shall be able to prevent objects from slipping or falling due to tilt during operation.

5.14 A drop section shall have upper and lower limit switches, so that the power supply of the lifting motor will be cut off when the drop section is in place. The limit position shall be equipped with stop blocks and meet the strength requirements.

5.15 When loading and unloading by hand, the convenience and safety of operation shall be considered, and mechanical devices shall be used in the following situations:

- a) The mass of a packaged article is greater than 55 kg;
- b) The moving speed of a packaged article is greater than 15 m/min.

5.16 Interlocking devices shall be set near the turnout of an accumulation overhead conveyor to prevent the trolleys of the working conveying line from being sent to the non-working conveying line or the full-position conveying line.

5.17 All common lubricating points shall be easy to fill with oil, and the protective cover shall not be removed when lubricating.

5.18 The clearance height of the pedestrian passage below the equipment shall not be

6.6 The operators shall load objects according to the regulations, and the overhead conveyors shall not be overloaded. The loading operation procedures shall be indicated in the obvious position near the loading station, and the procedures shall include the allowable loading amount, positioning method, and limit size.

6.7 The equipment, especially the driving devices, tractive chains, and slings, shall be kept in good working condition and maintained in time. All loading, unloading, and operating stations as well as overhead conveyor passages shall be kept clean.

6.8 If the part where the safety guards are to be removed is located in the work area or where people pass, the part shall be separated by a fence to prevent people from approaching.

6.9 After safety guards have been removed from a running conveyor, maintenance work can only be carried out by designated personnel. Designated personnel shall wear tight overalls, and a designated person shall supervise the operation near the stopping switch. After the safety guards are re-installed, they shall be approved by the safety technical department or jointly approved by the maintenance inspector and the operator before being re-started.

6.10 Manual lubrication shall not be carried out during the operation of the equipment, unless the location of the parts to be lubricated allows the operation; or special devices are provided and the safety can be ensured, then the operation can be carried out. If the shield needs to be opened for lubrication, the equipment shall be stopped for lubrication.

6.11 The tractive chain shall be lubricated regularly with lubricating oil, not lubricating grease.

6.12 It is strictly forbidden that objects (ladders, springboards, etc.) lean on or are placed on the chains or tracks. If the maintenance personnel have to do so, the equipment shall be stopped.

6.13 Overhead conveyors shall not be used for tasks other than those specified in the design, nor shall they be used under operating conditions that do not meet the requirements of product technical documents.

6.14 During the use and maintenance of an overhead conveyor, the circuit shall not be changed arbitrarily to avoid the failure of the safety devices; the maintenance of electrical equipment in dangerous places shall comply with the relevant provisions of GB 3836.16.

6.15 The maintenance content and cycle of each component of an overhead conveyor shall be carried out in accordance with the provisions in Appendix A.

6.16 The inspection, adjustment, maintenance, and cleaning of overhead conveyor equipment shall comply with the requirements of the manufacturer's technical

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