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PEOPLE'S REPUBLIC OF CHINA**

GB/T 36865-2018

Grain and oil machinery - Screw conveyor

粮油机械 螺旋输送机

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by the National Food and Strategic Reserves Administration and is under the jurisdiction of the National Technical Committee on Grain and Oil Standardization (SAC/TC 270).

The standard was issued on 17 September 2018 by the State Administration for Market Regulation and the Standardization Administration of the People's Republic of China, and has been in force since 1 April 2019.

1 Scope

China's national standard for the screw conveyors used to move grain and other powdery or

granular products through mills, silos and processing plants. A screw conveyor is a helical flight turning inside a trough - the Archimedes screw with a motor on it - and it survives in modern plant because it does what a belt cannot: the material travels inside a closed casing, so dust stays in and contamination stays out, the flow can be metered by shaft speed, and the machine takes up almost no floor space. In a grain plant those virtues come with a specific cost, because grain is fragile and a screw drags it against the trough wall; broken kernels lose value, generate dust and spoil faster, so this standard puts a ceiling on the breakage the machine is allowed to add. Around that it fixes the things that decide whether a conveyor works and keeps working: a series of ten basic models from 100 mm to 800 mm of screw diameter with their matching pitches and speed ranges, the thickness of the flight, the tolerances on screw diameter and pitch, and the clearance between flight and trough - too tight and the machine seizes on a stone, too loose and it stops conveying. It also settles the shaft materials and the way the flights are welded to them, the straightness and roundness of the casing, bearing seals that must not leak oil into the product, a limit on bearing temperature rise and one on noise, and it requires that the screw and the intermediate hangers can be serviced without dismantling the drive. Materials in contact with the product must not contaminate it, and guards and warning signs are required at exposed rotating parts and at the inlet and outlet openings. Capacity and drive power are calculated from formulas given in an annex and the model designation follows a code set in another, so that a purchaser can specify a machine and a supplier quote one without ambiguity.

This standard specifies the terms and definitions, the working principle, the models and basic parameters, the technical requirements, the test methods, the inspection rules and the requirements for marking, packaging, transport and storage of screw conveyors.

This standard applies to screw conveyors whose working position is horizontal or close to horizontal, with an angle of inclination not greater than 20 degrees, and which convey powdery or granular grain continuously and evenly.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition, including all amendments, applies.

GB/T 191 Packaging - Pictorial marking for handling of goods

GB 2894 Safety signs and guideline for the use of them

GB/T 3768 Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane

GB/T 5210 Paints and varnishes - Pull-off test for adhesion

GB 5226.1 Electrical safety of machinery - Electrical equipment of machines - Part 1:
General requirements

GB/T 13306 Plates

GB/T 24854 Grain and oil machinery - General specification for product packaging

GB/T 24855 Grain and oil machinery - General specification for assembly

GB/T 24856 Grain and oil machinery - General specification for castings

GB/T 24857 Grain and oil machinery - General specification for plate and plate-type steel
members

GB/T 25218 Grain and oil machinery - General specification for product coating

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 screw conveyor - a machine that conveys granular or powdery material by means of a
rotating helical flight.

3.2 capacity - the mass of material conveyed in unit time.

3.3 rotational speed of screw - the number of revolutions of the screw in unit time.

3.4 diameter of screw - the projection of the helical flight and the screw shaft on a vertical
plane.

3.5 pitch of screws - the axial distance between the corresponding points of two adjacent
turns of the helical flight, measured on the mean diameter line.

3.6 angle of inclination - the acute angle formed between the longitudinal centre line of the
screw conveyor and the horizontal plane.

3.7 filling coefficient - the coefficient expressing the degree to which the trough of the screw
conveyor is filled with material.

4 Working principle

A screw conveyor is generally made up of a trough, the helical flight, the screw shaft, the
end bearings, the intermediate hanger bearings and the drive unit. The helical flight is fixed
to the screw shaft; the shaft is supported by the bearings at its two ends and by the
intermediate hanger bearings, and is turned by the drive unit. The material enters the
trough through the inlet and, pushed by the rotating helical flight, moves along the trough in
the axial direction until it is discharged at the outlet.

5.1 Method of composing the model designation

The model designation is composed in accordance with Annex A.

5.2 Basic models of screw conveyors

The basic structure of the screw conveyor is shown in Figure 1, in which S is the pitch and D is the screw diameter, and the basic models are listed in Table 1.

Table 1 gives ten basic models. Model TLSS100: screw diameter 100 mm, pitch 100 mm, rotational speed 71 to 140 r/min. TLSS125: diameter 125 mm, pitch 125 mm, 63 to 125 r/min. TLSS160: diameter 160 mm, pitch 160 mm, 56 to 112 r/min. TLSS200: diameter 200 mm, pitch 200 mm, 50 to 100 r/min. TLSS250: diameter 250 mm, pitch 250 mm, 45 to 90 r/min. TLSS315: diameter 315 mm, pitch 315 mm, 40 to 80 r/min. TLSS400: diameter 400 mm, pitch 355 mm, 36 to 71 r/min. TLSS500: diameter 500 mm, pitch 400 mm, 32 to 63 r/min. TLSS630: diameter 630 mm, pitch 450 mm, 25 to 50 r/min. TLSS800: diameter 800 mm, pitch 500 mm, 20 to 40 r/min.

5.3 Basic parameters of screw conveyors

The capacity and the drive power of the screw conveyor are calculated in accordance with B.1 and B.2 of Annex B respectively.

6.1 General requirements

6.1.1 The product shall comply with the requirements of this standard and shall be manufactured in accordance with drawings and technical documents approved through the prescribed procedure.

6.1.2 Raw materials, bought-in parts and parts supplied by outside partners shall carry a certificate of conformity and may be used only after they have been inspected and found acceptable.

6.1.3 Plate parts and plate-type steel members shall comply with GB/T 24857.

6.1.4 Castings shall comply with GB/T 24856.

6.1.5 Assembly shall comply with GB/T 24855.

6.1.6 The coating of the product shall comply with GB/T 25218.

6.1.7 All welds shall be uniform and firm and shall be free from cracks, gas pores, slag inclusions, missed welds, burn-through, false welds and similar defects.

6.1.8 The installation and acceptance of the product shall be carried out in accordance with the instruction manual and the relevant regulations.