

ICS 67.260

CCS X 91



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 25731-2010

Grain and oil machinery - Long tube evaporators

粮油机械 长管蒸发器

Issued on: December 23, 2010

Implemented on: March 1, 2011

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

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Foreword

Appendix A of this standard is a normative appendix. The standard proposed by the National Food Authority. This standard by the National Standardization Technical Committee OILS. This standard was drafted. State Grain Reserve Xi'an Oil Research and Design Institute. The main drafters of this standard. Wei Bing, Zeng Wei-li, Wu Shengping. Grain and oil machinery long tube evaporator

1 Scope

China's national standard for the long tube evaporators used in grain and oil processing. It specifies the types and basic parameters, the technical requirements, the test methods, the inspection rules and the marking, packaging, transport and storage. An evaporator removes water from a solution by boiling it, and in an oil mill or a starch or syrup plant that is one of the largest energy consumers on the site - a solvent extraction plant evaporates the hexane from the miscella, a starch plant concentrates the glucose or maltose syrup, and a protein plant concentrates the steep liquor. Doing it economically is the whole engineering problem, because evaporating a tonne of water needs roughly a tonne of steam in a single stage, and no plant can afford that. The answer is multiple effect: the vapour boiled off in the first effect is used as the heating medium in the second, which operates at a lower pressure and therefore a lower boiling point, and so on down the train - so one tonne of steam evaporates three, four or five tonnes of water depending on how many effects there are. The long tube design suits this because it is a once-through falling or rising film: the liquid passes through long vertical tubes as a thin film with a very short residence time, which gives a high heat transfer coefficient and, more importantly for a food product, avoids holding heat-sensitive material at temperature. Syrup that is held hot darkens and develops off-flavours; protein denatures; and in a solvent plant a long residence time is a hazard as well as a quality problem. So the standard specifies the tube bundle and its geometry, the distribution that must wet every tube evenly since a dry tube fouls immediately, the separator, the vacuum system, the heat transfer and evaporation capacity, and the cleaning access. Issued on 23

December 2010 and in force since 1 March 2011.

This standard specifies the long tube evaporator relevant terms and definitions, working principle, model and basic parameters, technical requirements, test methods, inspection rules, marking, packaging, transportation and storage requirements. This standard applies to vegetable oil extraction long tube evaporator, mixed oil separation.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB 150 steel pressure vessels

GB 151 shell and tube heat exchangers

GB/T 191 Packaging - Pictorial signs

GB/T 4272 General technical equipment and pipeline insulation

GB/T 8873 Oils Oil Industry Terminology GB/T 13306 signs

GB/T 24854 grain and oil machinery products packaging technology GB Z158 workplace occupational hazard warning labels SBJ04 oil extraction factory fire safety norms Safety Technology Supervision TSGR0003-2007 simple pressure vessels (the State Administration of Quality Supervision, Inspection and Quarantine Announcement 2007 No. 18)

3 Terms and Definitions

And the following terms and definitions GB/T 8873 established apply to this standard.

3.1 Mixed oil miscela A mixture of oil and solvent.

3.2 Mixed oil concentration miscelaconcentration Oil mixed oil mass fraction of the total.

4 Works

Indirect heating by heat mixing oil, grease and solvents with different boiling point of the mixed solvent was evaporated oil, grease and solvents to achieve The purpose of separation.

5 Models and basic parameters

5.1 Model Methodology Executed in accordance with Appendix A.