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

LS/T 1813-2017

**Grain and oil storage. Monitoring and control system of
stored-grain condition technical requirements for digital
measuring temperature cable**

(English Translation)

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Table of Contents

Foreword

1 Scope

2 Normative references

3 Terms and definitions

4 Technical requirements

4.1 General technical requirements

4.2 Dimensional requirements

4.3 Sheath technical requirements

4.4 Wire Technical Requirements

4.5 Digital temperature measurement cable connector technical requirements

4.6 Technical requirements for interconnects

4.7 Technical requirements for digital temperature measurement cable digital sensors

5 Test methods

5.1 Performance test

5.2 Anti-fumigation corrosion test method

5.3 Digital temperature measurement cable tensile strength test method

5.4 Environmental test

5.5 Test method for sheath material

5.6 Connector inspection method

6 Marking, packaging, transportation and storage of products

6.1 Product logo

6.2 Packaging mark

6.3 Packaging

6.4 Transportation

6.5 Storage

Foreword

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

This standard was proposed by the National Grain Administration.

This standard is under the jurisdiction of the National Grain and Oil Standardization Technical Committee (SAC/TC270).

1 Scope

This standard specifies the terms and definitions, technical requirements, product inspection methods, inspection rules, and standards for the digital temperature measurement cable of the grain condition measurement and control system.

Technical requirements for ambition, packaging, transportation and storage.

This standard applies to the manufacture, use, inspection and maintenance of digital temperature measurement cables for grain inspection.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 191 packaging storage and transportation icon GB/T 2423.1 Environmental testing of electrical and electronic products - Part 2. Test methods Test A. Low temperature GB/T 2423.2 Environmental testing of electric and electronic products - Part 2. Test method Test B. High temperature Conductor of GB/T 3956 cable GB/T 4798.1 Environmental conditions for application of electric and electronic products - Part 1. Storage GB/T 4798.2 Environmental conditions for the application of electric and electronic products - Part 2. Transport GB/T 6587.3 Electronic measuring instrument humidity test GB/T 6995.1 Wire and cable identification method - Part 1. General GB/T 8358 wire rope actual breaking tensile force determination method GB/T 9330.2 Plastic insulated control cables - Part 2. PVC insulated and sheathed control cables GB/T 11463 Electronic Measuring Instrument Reliability Test GB/T.20118 general purpose wire rope LS/T 1809-2017 General technical requirements for grain and oil storage grain control

3 Terms and definitions

The following terms and definitions apply to this document.

Digital temperature measuring cable the temperature measuring cable using the digital temperature sensor generally consists of four parts. a sheath, a wire, a tensile wire, and a digital temperature sensor.

Digital temperature sensor A general term for temperature sensors that are used for grain and oil temperature detection and output digital quantities.

Interconnecting wire

Used to connect the wires between the digital temperature measurement cable and the

extension.

Connector connecting plug an anti-fumigation sealed plug that connects the digital temperature measurement cable and interconnect.

4.1 General technical requirements

Digital temperature measurement cables should meet the following requirements.

- Insulation and sheath should be complete and continuous without defects;
- The surface is smooth and even, the thickness is uniform;
- The sensor parts are welded firmly and the suspension components are strong and durable;
- Both ends of the cable and the lead connection should be sealed to resist corrosion of PH₃ gas;
- Cable should be added with steel wire (or wire rope) to increase its overall tensile strength;
- Electrical performance is stable, in accordance with the relevant provisions of GB/T 11463;
- Low temperature resistance, in accordance with the relevant provisions of GB/T 2423.1;
- High temperature aging resistance, in accordance with the relevant provisions of GB/T 2423.2.

4.2.1 Outline dimensions of digital temperature measuring cable for flat warehouse

4.2.1.1

Round, diameter $\phi \geq 8.0\text{mm}$.

4.2.1.2

Flat shape, width $\geq 9.0\text{mm}$, thickness $\geq 3.0\text{mm}$.

4.2.2 Dimensional requirements for digital temperature measuring cables for shallow round silos and vertical silos

4.2.2.1 The height of the grain stack is $\leq 15\text{m}$, and the cross-section shape of the cable is elliptical, flat, width $\geq 20\text{mm}$, thickness $\geq 15\text{mm}$.

4.2.2.2 $15\text{m} < \text{stack height} \leq 25\text{m}$, cable cross-section shape is elliptical, width $\geq 25\text{mm}$, thickness $\geq 15.5\text{mm}$.

4.2.2.3 $25\text{m} < \text{stack height} \leq 30\text{m}$, cable cross-section shape is elliptical, width $\geq 27\text{mm}$,

thickness $\geq 16\text{mm}$.

4.2.2.4 $30\text{m} < \text{stack height} \leq 45\text{m}$, cable cross-section shape is elliptical, width $\geq 30\text{mm}$, thickness $\geq 16.5\text{mm}$.

4.2.2.5 The height of the grain is $\geq 45\text{m}$, the cross-section of the cable is elliptical, the width is $\geq 32\text{mm}$, and the thickness is $\geq 17\text{mm}$.

4.3.1 Production process requirements

The jacket production process requires extrusion molding.

4.3.2 Material Requirements

The sheath material is as follows.

--- The digital temperature measuring cable sheath used in the flat warehouse should be made of high-pressure polyethylene material, and the finished grain should be food grade high-pressure polyethylene;

--- The digital temperature measuring cable sheath used in the shallow round silo and the vertical silo is made of high pressure polyethylene or nylon material;

--- The sheath of the interconnect is made of high pressure polyethylene;

--- The digital temperature measuring cable sheath used in the oil tank is made of food grade high pressure polyethylene.

4.4.1.1 Core color requirements

4.4.1.1.1

The color of the tinned copper wire sheath shall comply with the provisions of GB/T 6995.1.

4.4.1.1.2

Two core wires, one of which is the signal wire (white) and the other wire is the ground wire (black).

4.4.1.1.3

Three-core cable, two of which are power cables (red for positive and black for negative) and one for signal (green).

4.4.1.2 Core cross-sectional area requirements

Meet the relevant provisions of GB/T 3956 0.3mm² multi-strand copper wire strand.