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

NB/T 11642-2024

**General technical requirements for longitudinal tear protection
device of coal mine conveyor belt**

煤矿用输送带纵向撕裂保护装置通用技术要求

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1 Scope

NB/T 11642-2024 is the Chinese specification for the devices that detect a conveyor belt tearing lengthwise in a coal mine. A longitudinal tear is one of the most expensive failures underground: something sharp - a roof bolt, a lump of rock, a broken idler - gets trapped at a transfer point and rides under the moving belt, splitting it open along its length. A belt in a modern mine can be kilometres long and worth millions, the tear grows at belt speed, and by the time anyone notices from the spilled coal the damage may run for hundreds of metres. The economics are simple: a detector that stops the drive within a couple of metres of the tear turns a belt replacement into a patch, and a mine that has to replace a main conveyor belt loses production for as long as it takes. This document sets what such a device has to be able to do, and it is written to cover the whole spread of physical principles in use rather than mandating one: laser sensing, camera imaging, X-ray, infrared sensing and pressure sensing devices are each defined, along with the pull-wire, weighing plate and flap-plate types. It fixes the model designation scheme, the supply requirements, the composition into emitting, receiving and monitoring equipment, and the appearance and construction rules including the explosion protection requirements of the GB/T 3836 series that any equipment taken below ground must satisfy. The functional requirements are concrete: the alarm must be audible and visible and must latch until manually reset, the device must output a control signal immediately, locate the tear, report its own faults, display its state, store data and allow the history to be queried; camera devices must show and store the complete belt image; laser and camera devices must self-clean coal slurry and dust off their optics; laser, camera and infrared devices must reject false alarms caused by ambient light; and X-ray devices must meet the radiation protection requirements of GBZ 117-2015. The performance figures are equally explicit: belt speed at least 3.15 m/s, recognition distance for laser and camera devices at least 450 mm, minimum recognisable tear width 2 mm, recognition accuracy at least 90 percent, positioning error not more than 2 m, and an alarm of at least 80 dB(A) at one metre visible at twenty metres in the dark. Test methods, inspection rules and the requirements for marking, packaging, transport and storage follow. It was issued on 24 September 2024 by the National Energy Administration

and takes effect on 24 March 2025.

This document specifies the product model and classification, technical requirements, test methods, inspection rules and Marking, packaging, transportation and storage. This document is applicable to the longitudinal tear protection of mining conveyor belts in coal mines, open-pit coal mines, coal preparation plants, non-coal mines and other mining fields. protective device (hereinafter referred to as the "device").

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document. document.

GB/T 191 Pictorial markings for packaging, storage and transportation

GB/T 2423.1-2008 Environmental testing for electric and electronic products Part

3 Radio frequency electromagnetic field radiated immunity test

GB/T 17626.4 Electromagnetic compatibility test and measurement technology Electrical fast transient burst immunity test

GB/T 17626.5 Electromagnetic compatibility test and measurement technology surge (shock) immunity test GBZ 117-2015 Radiation protection requirements for industrial X-ray inspection AQ 1043 Mining Product Safety Signs and Labels MT/T 210-1990 Basic test methods for electrical and electronic products used for communication, detection and control in coal mines

4 Equipment protected by intrinsic safety type "i"

GB/T 3836.9 Explosive atmospheres Part

9 Equipment protected by encapsulation type "m"

GB/T 4208 Degrees of protection provided by enclosures (IP Code)

GB/T 9969 General Principles for Instructions for Use of Industrial Products

GB/T 10111 Random number generation and its application in product quality sampling inspection

GB/T 12173 General electrical equipment for mining

GB/T 17626.2 Electromagnetic compatibility test and measurement technology

Electrostatic discharge immunity test

GB/T 17626.3 Electromagnetic compatibility test and measurement techniques Part

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