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**Full face tunnel boring machines - Dual mode earth pressure
balanced and slurry balanced tunnel boring machines**

全断面隧道掘进机 土压平衡-泥水平衡双模式掘进机

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Foreword

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1 Scope

China's national standard for dual mode tunnel boring machines capable of both earth pressure balance and slurry balance operation. The machine exists because a long tunnel does not stay in one kind of ground. An earth pressure balance machine supports the face with the excavated soil itself, conditioned into a paste, and works well in clays and silts; a

slurry machine supports it with pressurised bentonite and works where the ground is coarse, permeable and water-bearing. A drive that begins in clay and enters sand and gravel halfway would need a different machine for each half, and changing machines mid-tunnel means a shaft, a disassembly and months. A dual mode machine converts in place: the screw conveyor is replaced or supplemented by a slurry circuit, and the face support changes from paste to suspension. The conversion is the engineering problem, and the standard's requirements are largely about doing it underground, safely, in a working tunnel.

This document specifies the terms and definitions, models and basic parameters, technical requirements, test methods of earth pressure balance-slurry balance dual-mode roadheaders law, inspection rules, accompanying documents, marking, packaging and transportation: This document applies to the design, manufacture and inspection of earth pressure balance-slurry balance dual-mode roadheaders (hereinafter referred to as roadheaders):

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document:

GB/T 150 (all parts) Pressure Vessels

GB/T 191 Graphical signs of packaging, storage and transportation

GB/T 1985-2014 High-voltage AC isolating switch and grounding switch

GB 2894 Safety Signs and Guidelines for their Use

GB/T 3766 General rules and safety requirements for hydraulic transmission systems and their components Conductor of GB/T 3956 cable

GB/T 4208 enclosure protection class (IP code) GB/T 5226:

1 Mechanical and Electrical Safety Mechanical and Electrical Equipment Part 1: General Specifications GB 5226:

3 Mechanical Safety Mechanical Electrical Equipment Part 11: Voltage High Voltage 1000V a.c. or 1500V d.c. but not exceeding Technical conditions of 36kV high voltage equipment

GB/T 6388 Receipt and Delivery Marks for Transport Packaging

GB/T 7932 General rules and safety requirements for pneumatic systems and their components GB/T 10595 Belt Conveyor

GB/T 13283 Accuracy class of testing instruments and display instruments for industrial process measurement and control GB/T 13306 Signs

GB/T 13384 General technical conditions for packaging of mechanical and electrical products

GB/T 14039 Hydraulic Transmission Fluid Solid Particle Pollution Degree Code GB/T 14048:

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