

ICS 7.06
CCS D 14

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

MT/T 773-1998

**Norms for classification of hydrogeological condition of coal
mine**

(English Translation)

Issued on: November 10, 1998

Implemented on: April 1, 1999

Issued by: State Administration of Work Safety

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Code for classification of hydrogeological conditions in coal mines

1 Scope

This standard is applicable to the production of coal mines, and can also be used as a reference when planning to construct or construct coal mines. It is the basis for classification of hydrogeological conditions of coal mines.

2 Basic requirements

2.1 According to a certain feature of coal mine hydrogeological conditions, combined with the actual situation to classify, different types should have significant characteristics.

2.2 It should be universal and widely applicable.

2.3 This specification adopts the single classification principle, and its concept is clear, which can determine the hydrogeology and mining conditions of a coal mine.

3 Classification of hydrogeological conditions in coal mines the specific classification method is. (1) classification according to the burial depth of the mining coal seam and its associated aquifer; (2) according to the coal seam mining period Classification of the main water-filled water sources; (3) sub-types according to the water-rich coefficient of the coal mine (that is, the ratio of the total gushing water of the mine to the coal production);

(4) Make auxiliary types according to potential water damage factors.

3.1 Classification by burial depth

3.1.1 Nudity (Class I) all coal mining seams are above the local erosion base. Water in water-filled aquifers includes. upper stagnation, diving, no pressure or pressure Interlayer

water. Mine gushing water can be discharged by drainage by drainage, and generally does not pose a threat to the mine. Mine flooding is mainly controlled by atmospheric precipitation.

3.1.2 Semi-naked (Class II) the upper part of the coal mining coal seam is above the local erosion reference level, while the lower part is below this surface.

Water in the water layer includes. upper water stagnation, diving, non-pressure or pressure inter-layer water. Water in the aquifer above the base level of erosion is essentially pressureless, while the water in the aquifer below the quasi-plane has a certain pressure. Mine gushing water generally affects the mining of coal seams.

Heavy influence. Both self-flow and mechanical drainage methods are used. Mine water influx is significantly affected by the precipitation season.

3.1.3 Shallow buried type (type III) the mining coal seams of the coal mine are all below the local erosion reference level, and the burial depth is less than 500 m. The upper part of coal-bearing strata usually has the quaternary system is covered by loose layers, and some tertiary systems are under the quaternary system in some areas. For coal mining faces, the water in the aquifer is There is a certain head pressure. The amount of water in the mine and the method of water inflow have a direct impact on the mining of the coal seam. Mine flooding affected by precipitation season the effect of the festival is obvious.

3.1.4 Deep-buried class (Class IV) the mining coal seams of the coal mine are all buried in the local erosion base level 500 m or less. It is usually covered with thick pine above the coal measures.

Scattered ground or rock formation. The main water-filled aquifer of a coal mine is composed of confined sandstone fissure water, thin-layer limestone karst fissure water, or an ancient karst system.

Thick layer of limestone fissure karst water. There is usually no modern karst development. The top and bottom floors of a coal seam mining face generally withstand high water pressure.

When there is no water-conducting structure, the amount of gushing water in the mine may not be large, and the water volume is stable, and it is basically not affected by the precipitation season.

3.2 Typing by direct water source

3.2.1 Atmospheric precipitation type (type I) this type of coal-filled water source mainly comes from atmospheric precipitation, and the mine gushing water is controlled by atmospheric precipitation. The peaks of gushing water and precipitation are basically the same.

Consistent, or slightly later. In arid season, the water in each aquifer generally decreases

sharply, and the amount of gushing water in the mine gradually decreases. This type mostly exists in Class I and II (that is, bare and semi-naked) coal mines, and type III (that is, shallow buried) coal mines are relatively rare. Based on precipitation data, Surface subsidence or subsidence, as well as the condition of ground fissures, can roughly determine the relationship between precipitation and water influx from the mine.

3.2.2 Surface water type (type II) this type of coal mine is more common in type III (ie, shallow buried) mines. Mine is mostly located near the surface water body or directly below the surface water body. Pick Subsidence areas and large settlement cracks, which are generated later, have become the main channels for water filling in mines. Coal mines in karst areas in southern China Floods in Ligu, Anhe and subsidence areas flooded into the mines and even caused flooding accidents. Gushing water from surface water type coal mines generally forms a fixed head supply.

The amount of gushing water in the mine depends on the water-passing capacity of the channel, the size of the hydraulic gradient, and the abundance of the water source.

3.2.3 Pore water type (three types) Groundwater existing in the pores of the loose layer is pore water. Generally refers to the waters of the Quaternary and Tertiary aquifers, but also unearthed ancient strata Aquifer water. Except for a few layers of stagnant water, it mainly exists in diving and confined water. Its main sources of supply are atmospheric precipitation, ground Infiltration of surface water. Fracture and karst water can also be used as make-up water. When the direct water source of the mine is pore water, it is called pore Water-type coal mine. This type is more common in shallow buried (type III) coal mines, or encountered when building wells in thicker loose areas. Often with high silt content Turbid water poured into the mine, causing serious losses. In the hidden outcrop area of coal mines, there are thick loose strata. When mining coal seams, in the case of the water-proof layer at the bottom of the scattered layer, sufficient waterproof coal rock pillars should be left.

3.2.4 Fractured water type (four types) the groundwater existing in the bedrock fissure system is called fissure water, and it exists in the form of diving, unlayered or confined water. Coal seam roof and floor the amount of gushing water in sandstones is generally not large, and most of them can be dredged and are not a problem. But in the tectonic development area, a large sudden can also form Water, accompanied by large-area water gushing.

3.2.5 Karst water type (five type) Groundwater that occurs in soluble formations is collectively called karst water. Most coal mines in China mine coals from the Carboniferous and Permian. North Otau it is limestone water (hereinafter referred to as Austrian grey water), and Maokou limestone water in the south poses a threat to coal seam mining. Thin layer of limestone water in northern coal measures (Hereinafter referred to as thin gray water) is mostly a source of direct water inrush, and there is a lot of Austrian gray water supply. The amount of water inrush depends on the difference between thin gray water and

Austrian gray water.

Connectivity, and the richness of the water. Thin limestone karst water has great heterogeneity under the control of geological structure and hydrogeological unit.

, Regional and regional.

Thick limestone karst water is plentiful because of the large area receiving precipitation and other water-bearing systems and abundant water sources. Thick layer of gray the degree of karst development has greater heterogeneity and strong regionality, and the degree of karst development has certain regularity with increasing burial depth. in South China is dominated by modern karsts, and the law of weak karst development with increasing burial depth is very obvious; in the north, it is dominated by ancient karsts.

Modern karst developed on the ancient karst, and the regularity of karst development weakening with increasing depth is not obvious.

3.3 Subtypes according to water-rich coefficient (F) Water-rich coefficient (F) refers to the ratio of the total drainage and coal production of a coal mine. For production coal mines, Calculation of coal volume; for design and infrastructure coal mines, calculations can be made based on the design output and total annual drainage.

3.3.1 Water-poor subtype (subtype 1) the water content of the water-filled aquifer in the coal mining coal mine is scarce, and the amount of water in the mine is small, that is, $F \leq 5$. This subtype coal mine is mostly distributed in arid or semi-dry Arid area. When $F \leq 1$, there is generally a severe lack of water, and it is difficult to find a water source nearby. Demonstration of the water supply source is required before development; when $F \geq 1$ at the same time, it is necessary to determine the size of the coal mine according to the adequacy of the water source.

3.3.2 Poorer water subtypes (subtype 2) the water content of the water-filled aquifer in the coal seam of coal mining is relatively scarce, and the amount of water in the mine is not large, and its F value is between 5-10. The subtype coal mine investment the cost of water control is generally not high, and a good source of water can be found.

3.3.3 Water-rich subtypes (subtype 3) Water-filled aquifers in coal mining coal seams are richer in water than mines, and their gushing water volume is larger, and their F value is between 10-20. The subtype coal mine's straight Water sources for filling water are mostly thin limestone dissolved water.

3.3.4 Water-rich subtype (subtype 4) the water content of the water-filled aquifer in the coal seam of coal mining is abundant, and the mine is gushing a lot of water, its $F \geq 20$. This subtype coal mine has thick limestone karst Water constitutes an indirect or direct source of water. When $F \geq 40$, the prospect of coal mine development should be demonstrated; when $F \geq 80$, it is generally difficult to develop.