

ICS 13.220.50

CCS C84



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

GB 28376-2012

Fireproof board for tunnels

隧道防火保护板

Issued on: May 11, 2012

Implemented on: September 1, 2012

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China;
Standardization Administration of China**

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Foreword

This standard Chapter 5, Chapter 7 are mandatory, the rest are recommended. This standard was drafted in accordance with rules GB/T 1.1-2009 given. The standard proposed by the People's Republic of China Ministry of Public Security. This Standard Technical Committee (SAC/TC113/SC7) administered by the National Fire Protection fire prevention materials Standardization Technical Committee points. This standard is drafted. Sichuan Fire Research Institute Ministry of Public Security, Ministry of Communications Highway Research Institute. It participated in the drafting of this standard. Sichuan Tianfu Fire Materials Co., Ltd., Shanghai Xinlong fire Material Co., Ltd., Chongqing's Spirit Paint has Limited long Sha Weite fire New Material Technology Co., Ltd. Jiang Xi Boao fire prevention materials, Zhejiang Dongyang Babai home fireproof materials Limited. The main drafters. Yuan Yali, Cheng Daobin, Nie Tao, Mao Zhaojun, Pu Aiping, Wang Pengxiang, Wei Yu, Zhang Cai, Yao Jianjun, Liu Heng rights, Zeng Xu Bin. Tunnel fire protection board

1 Scope

GB 28376-2012 is the Chinese national standard on fireproof board for tunnels, in the field of environment and health protection, safety. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 11 May 2012 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 September 2012. Classification: ICS 13.220.50, CCS C84. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

6.2.4 areal density Take 600mm x 600mm test piece 3 (comprising a decorative panel and a fire-retardant insulation layer, such as a decorative panel is a multilayer panel superposed to the actual Layers used in tunnel construction date), respectively called the test piece quality, accurate to 1g, and the respective test pieces were measured in length and width to the nearest 1mm. According to formula (1) surface density is calculated. $d = \frac{m}{lb}$ (1) Where. D

--- areal density in kilograms per square meter (kg/m^2);

--- m sample mass, in kilograms (kg);

--- sample length L , in meters (m); Sample B

--- width in meters (m). 3 averaged areal density of the sample as a sample.

6.2.5 edge flatness measurement The four sides of the plate are sequentially against a length greater than the reference line side of the plate, with the plate edge and caliper measurements of most reference line A large distance to the nearest 0.1mm. (2) calculating edge flatness by the formula. $P = \frac{hL}{1000}$ (2) Where. P

--- edge flatness, (per mille); H

--- maximum distance reference line and the plate edge, in millimeters (mm); L

--- measuring plate edge, in millimeters (mm). Maximum calculated value takes four sides of the sample as the edge flatness.

2 Normative references

The following documents for the application of this document is essential. For dated references, only applies to the version dated paper Pieces. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 191 Packaging Pictorial signs

GB/T 7019-1997 Test Method fiber cement article

GB/T 8626 supplies Flammability Test Method Determination

GB/T 9265 alkali resistance of architectural coatings and

GB/T 9978.1 building components resistance test methods - Part 1. General Requirements

GB 14907 steel structure fire

GB/T 20284 building materials and products of combustion test monomers

GB/T 20285 smoke toxicity risk stratification material

GB 50010 Design of Concrete Structures GA/T 714-2007 member rapid heating test method for fire protection refractory material JC/T 646-2006 magnesium duct

3 Water absorption of 100 x 100 3 8

6.4 dry flexural strength When the thickness of the specimen $e \leq 20\text{mm}$, according to FIG. 2a) from the position shown in solid lines each sheet of the two specimens taken; $e > 20\text{mm}$, the press of FIG. 2b) The position shown in solid lines taken from each plate contained four specimens, specimen size shown in Table 5. The test piece placed in $100\text{ }^{\circ}\text{C} \sim 105\text{ }^{\circ}\text{C}$ drying oven to Constant quality, the conditions for determining an interval rate of mass change before and after 2h the two weighing no more than 1%. The test pieces dried in a desiccator, After cooling to room temperature, according to GB/T 7019-1997 test specified in

9.4.2 and calculating flexural strength test pieces. 2 specimens The average of four test results, four specimens are averaged eight test results as the dry bending strength of the specimen. Table 5 flexural strength test piece dimensions are in millimeters Thickness e Specimen size Length and width The distance between the fulcrum ≤ 20 250 250 215 > 20 10e 40 3e (minimum of not less than 100) 10e Absorbent saturation bending strength

6.5 Specimen thickness $e \leq 20\text{mm}$, according to FIG. 2a) from the position shown in broken lines each sheet of the two specimens taken; $e > 20\text{mm}$, according to FIG. 2b) Virtual Each plate from the position shown by a line taken four specimens, specimen size shown in Table 5. 24h is placed in the test piece in water at a temperature of $5\text{ }^{\circ}\text{C} \sim 35\text{ }^{\circ}\text{C}$ After taken out of water droplets wipe the surface with a wet towel, immediately press the 9.3.4 7019-1997 GB/T and a predetermined test and calculating

9.4.2 Flexural strength test piece. Average of two specimens taken four test results, the test piece 4 8 taken as the average of the results of tests saturated with water Flexural strength state.

6.6 moisture deformation rate 300mm x 300mm test piece taken of two, four reference

points to determine the specimen surface as shown in Figure 3, the reference points sequentially spaced 250mm. The test piece was immersed in 5 °C ~ 35 °C water over 24h, remove the specimen, accurately measured with a vernier caliper 1-2,2-3,3-4, The distance between the 4-1. The test piece was then placed in a (60 ± 3) °C oven dried within 24h ~ 28h after taken out, cooled to room temperature and measure 1-2,2-3,3-4,4-1 distance between the nearest 0.02mm. (3) the deformation rate calculated by the absorbent formula. $S = L1-L2L2 \times 100\%$ (3) Where. S

--- moisture deformation ratio (%); After the reference point L1

--- absorbent distance, in millimeters (mm);

--- the distance L2 of the reference point after drying, in millimeters (mm). Take four segment distance measurement data as the arithmetic mean of the moisture deformation of the specimen.

4.1 Classification

4.1.1 structured into.

- a) a single tunnel fire protection panels, indicated by symbol D;
- b) the composite tunnel fire protection panels, indicated by the symbol F.

4.1.2 fire test according to the heating curve is divided into.

- a) BZ categories. according to GB/T 9978.1 standard heating curve prescribed heating plate and fire protection tunnel measurement;
- b) HC Class. HC Press GA/T 714-2007 predetermined heating curve heating plate and fire protection tunnel measurement; C) RABT categories. Press GA/T 714-2007 RABT predetermined heating curve heating plate and fire protection tunnel measurements.

4.2 Model Model methodology of tunnel fire protection board. Test sheet structure category Classified according to fire resistance performance test methods Fire resistance, in hours (h) Sheet thickness, in millimeters (mm) Example 1. D-BZ-2.00-30, represents plate thickness of 30mm, the standard heating curve, fire resistance of a single tunnel fire protection board of 2.00h. Example 2. F-HC-2.00-30, represents the total thickness of 30mm, HC curve by heating, fire resistance of a composite of the tunnel fire protection board 2.00h. Example 3. D-RABT-1.50-30, represents plate thickness of 30mm, according RABT heating curve, fire resistance is raised 1.50h, 1.83h the cooling tunnel on a single Fire protection board.

5 Requirements

5.1 appearance quality Tunnel fire protection board (hereinafter referred to as sheet material) should have at least one surface is flat, the sheet should be crack, delamination,