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Nomenclature and terminology of cement

水泥的命名原则和术语

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2 Classification

2.1 By use and performance cement is divided into general purpose cement, the cement commonly used in ordinary civil engineering and building works, and special cement, cement with a special performance or a special use.

2.2 By the name of its principal hydraulic mineral cement is divided mainly into: portland cement, whose principal hydraulic minerals are tricalcium silicate, dicalcium silicate, tricalcium aluminate and tetracalcium aluminoferrite; calcium aluminate cement, whose principal hydraulic mineral is calcium aluminate; calcium sulphoaluminate cement, whose principal hydraulic minerals are anhydrous calcium sulphoaluminate and dicalcium silicate; calcium ferroaluminate cement, whose principal hydraulic minerals are anhydrous calcium sulphoaluminate, calcium ferroaluminate and dicalcium silicate; and calcium fluoaluminate cement, whose principal hydraulic minerals are calcium fluoaluminate and dicalcium silicate.

3 Naming principles

3.1 Cement is named by category, according to its principal hydraulic mineral, its mineral addition, its use and its principal characteristic.

3.2 General purpose cement is named after the silicate mineral of the cement and may carry in front of that name the name of a mineral addition or another suitable name, for example portland cement, ordinary portland cement, portland-slag cement.

3.3 Special cement is named after its principal mineral, its characteristic or its use, and may carry in front of that name a type designation or the name of a mineral addition, for example calcium aluminate cement, calcium sulphoaluminate cement, rapid hardening portland cement, low heat portland-slag cement, class G oil well cement.

4 Terms for cement products

4.1 cement: finely ground material which, mixed with water to form a plastic paste, can hydrate and harden in air and can go on hardening in water while keeping its strength and volume stability; an inorganic hydraulic binding material.

4.2 portland cement: hydraulic binding material made by finely grinding portland cement clinker with a suitable amount of gypsum, in which 0 % to 5 % of mineral addition is allowed.

4.3 ordinary portland cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker together with mineral addition not exceeding 20 % of the total mass of the cement as the principal components.

4.4 portland-slag cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and granulated blast furnace slag as the principal components.

4.5 portland-pozzolana cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and pozzolanic mineral addition as the principal components.

4.6 portland-fly ash cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and fly ash as the principal components.

4.7 portland-composite cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and two or more mineral additions as the principal components.

4.8 portland-phosphorous slag cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and granulated electric furnace phosphorous slag as the principal components.

4.9 portland-magnesium slag cement (English term as printed in the document): hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and magnesium slag as the principal components.

4.10 portland-limestone cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker and limestone as the principal components.

4.11 portland-steel slag cement: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker, converter or electric furnace steel slag and granulated blast furnace slag as the principal components.

4.12 portland cement for road: hydraulic binding material made by finely grinding, with a

suitable amount of gypsum, portland cement clinker whose tricalcium aluminate content does not exceed 5.0 % and whose tetracalcium aluminoferrite content is not lower than 16.0 %, together with a small amount of mineral addition, as the principal components.

4.13 portland-steel slag cement for road: hydraulic binding material made by finely grinding, with a suitable amount of gypsum, portland cement clinker whose tricalcium aluminate content does not exceed 5.0 % and whose tetracalcium aluminoferrite content is not lower than 16.0 %, together with converter or electric furnace steel slag and granulated blast furnace slag, as the principal components.

4.14 masonry cement: hydraulic binding material made by finely grinding mineral addition as the principal component with a suitable amount of portland cement clinker and gypsum.

4.15 oil well cement: hydraulic binding material with well cementing properties, made by finely grinding portland cement clinker of suitable composition as the principal component with a suitable amount of gypsum.

4.16 sulphate resisting portland cement: hydraulic binding material with a relatively high resistance to sulphate attack, made by finely grinding portland cement clinker of suitable composition as the principal component with a suitable amount of gypsum.

4.17 white portland cement: hydraulic binding material of a certain whiteness, made by finely grinding, with a suitable amount of mineral addition and gypsum, portland cement clinker obtained by burning raw meal of suitable composition to partial fusion, the clinker being rich in calcium silicate and low in iron oxide.

4.18 coloured portland cement: hydraulic binding material made by finely grinding white portland cement clinker as the principal component with a suitable amount of gypsum and pigment; or made by adding a small amount of colouring agent to the raw meal, burning it to coloured clinker and then grinding that clinker finely with a suitable amount of gypsum.

4.19 moderate heat/low heat portland cement: hydraulic binding material with a moderate or relatively low heat of hydration, made by finely grinding portland cement clinker of relatively low tricalcium aluminate content as the principal component with a suitable amount of gypsum.

4.20 calcium aluminate cement: hydraulic binding material made by finely grinding calcium aluminate cement clinker as the principal component.

4.21 calcium sulfo-aluminate cement: hydraulic binding material made by finely grinding calcium sulfo-aluminate cement clinker as the principal component, with or without a suitable amount of gypsum and mineral addition.

4.22 calcium ferro-aluminate cement: hydraulic binding material made by finely grinding calcium ferro-aluminate cement clinker as the principal component, without or with a suitable amount of gypsum and mineral addition.

5 Terms relating to the properties and test methods of cement

5.1 portland cement clinker: product consisting mainly of calcium silicate, obtained by proportioning calcareous and siliceous materials as the principal raw materials into raw meal, burning it to partial fusion and cooling it.

5.2 calcium aluminate cement clinker: product consisting mainly of calcium aluminate, obtained by proportioning calcareous and aluminous materials as the principal raw materials into raw meal, burning it to complete or partial fusion and cooling it.

5.3 calcium sulpho-aluminate cement clinker: product consisting mainly of anhydrous calcium sulpho-aluminate and dicalcium silicate, obtained by proportioning aluminous and calcareous materials and gypsum as the principal raw materials into raw meal, burning it to partial fusion and cooling it.

5.4 calcium ferro-aluminate cement clinker: product consisting mainly of anhydrous calcium sulpho-aluminate, calcium ferro-aluminate and dicalcium silicate, obtained by proportioning aluminous and calcareous materials and gypsum as the principal raw materials into raw meal, burning it to partial fusion and cooling it.

5.5 calcium fluo-aluminate cement clinker: product consisting mainly of calcium fluo-aluminate and calcium silicate, obtained by proportioning calcareous and aluminous materials and a small amount of fluorite as the principal raw materials into raw meal, burning it to complete or partial fusion and cooling it.

5.6 hydraulicity: property whereby a material ground to a fine powder and mixed with water into a paste forms stable compounds and can harden in moist air and in water.

5.7 pozzolanicity: property whereby a material ground to a fine powder has no hydraulicity on its own but, mixed with lime and water at ordinary temperature, forms products having hydraulicity.

5.8 mineral addition: mineral material added during the grinding of cement. According to its pozzolanicity or latent hydraulicity it is divided into active addition and inactive addition. Mineral additions in common use are granulated blast furnace slag, fly ash and pozzolanic mineral addition.

5.9 active addition: addition usually expressed by the activity index, that is the ratio of the 28 day compressive strength of the test cement to that of the reference cement; an addition whose activity index meets the requirement of the corresponding standard is an active addition.

5.10 inactive addition: addition usually expressed by the activity index, that is the ratio of the 28 day compressive strength of the test cement to that of the reference cement; an addition whose activity index is below the requirement of the corresponding standard is an inactive addition.