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COMPOSITION OF HYDRAULIC CEMENT
assigned to Cement Technology Corporation

METHOD FOR PRODUCING CEMENT

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A composition of hydraulic cement is disclosed, having low water demand, high strength and low fragility. The cement comprises finely ground Portland cement clinker, calcium sulfate and a dry modifier containing an organic water reducing component in a weight percent ratio of 91-97:2 and 7:0.085-4, respectively. The clinker particles comprise three fractions, I, II and III chemically bonded with the organic water reducing component and having respective particle sizes: I - 0.05-10 mkm in a weight percent of 15.3-34.3; II - 10.1-30 mkm in a weight percent of 37.2-77.5; III - 30.1-80 mkm in a weight percent of 4.2-19.6; plus a fraction IV - having a particle size more than 80 mkm in a weight percent less than 4.9 and free of the modifier. The calcium sulfate comprises a fraction of particles of a size 0.5-15 mkm, free of the modifier. The dry modifier is chemically bonded with the three clinker fractions in the following weight percent quantities: I - 0.045-1.7; II - 0.02-2.1; and III - 0.01-0.2. The modifier includes a hardening accelerator: an alkali sulfate or a gel-former. The water reducing component comprises, for example, water soluble salts of: the condensate with formaldehyde of sulfated aromatic compounds, or sulfated, condensed heterocyclic compounds, or sulfated condensed monocyclic aromatic hydrocarbons, or sulfated condensed polycyclic aromatic hydrocarbons, or a condensate of beta-naphthalenesulfonic acid with formaldehyde, or a sulfomethylised melamine resin, or a lignosulfonate, or a lignosulfonate compound modified with a carbamide-formaldehyde resin. The modifier covers the particles of fractions I-III.

PCT No. PCT/SE94/00389 Sec. 371 Date Oct. 30, 1995 Sec. 102(e) Date Oct. 30, 1995 PCT Filed Apr. 29, 1994 PCT Pub. No. WO94/25411 PCT Pub. Date Nov. 10, 1994. A method for producing cement useful for preparing pastes, mortars, concretes and other cement-based materials, having a high workability with reduced water content, high strength and density, and a rapid development of strength, which method includes a mechanicochemical treatment of cement. The method includes a two-stage mechanicochemical treatment of a mixture of cement and at least one of two components, the first component being a SiO₂-containing microfiller and the second component being a polymer in the form of a powdery water-reducing agent. In the first stage the cement and the first and/or the second component are intensively mixed in a dry state, whereby particles of the first and/or the second component are adsorbed on the cement particles. In the second stage the mixture obtained in the first stage is treated in milling equipment where the particles in the mixture receive in quick succession a large number of direct-changed impact impulses resulting in modification of the surface properties of the cement particles in the form of substantial increase of surface energy and chemical reactivity. The treatment in the second stage is carried out during a sufficiently long period of time in order that a 1-day compressive strength of a 20 mm per side cube of cement paste, which has been properly compacted under vibration and hardened at +20°C. in sealed conditions, at least equals 60 MPa.

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GLASS FORMULA FOR AVOIDING ASR

WATER-BORNE POLYURETHANE-MODIFIED CEMENT COMPOSITION

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The present invention relates generally to a glass formula for incorporation in glass/concrete compositions. The glass contains lithium. Alkali-silica reaction is avoided in the glass/concrete compositions.

A water-borne polyurethane modified cement composition is prepared from a dispersion of a water-dispersible polyurethane, a cross-linking agent, which is a polycarbodimide having N double bond C double bond N

functional groups, and cement. Optionally, a water-reducing agent, and a surfactant can be added. The modified cement composition has higher tensile strength, elongation and water resistance.

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**ULTRASONIC SCANNING APPARATUS FOR
NONDESTRUCTIVE SITE
CHARACTERIZATION OF STRUCTURES
USING A PLANAR BASED ACOUSTIC
TRANSMITTER AND RECEIVER IN A
ROLLING POND**

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The invention is a carriage type sonic or ultrasonic testing apparatus for flaw and deterioration detection testing in a structure, especially concrete. The apparatus

detects both location and type of flaw in a structure. The carriage unit incorporates a rolling pond feature which includes: (i) foam-covered tracks and rollers, this soft foam material in addition to its primary function prevents vibration of the transducers while traversing rough surfaces such as weathered concrete. The tracks and rollers form a water-tight seal with each other and the specimen surface; (ii) an air-removal brush assembly which maintains contact with a specimen surface to facilitate transmission and reception of ultrasonic energy into and out of a test specimen; (iii) an ultrasonic isolator element and optional wave absorbers; and (iv) the ultrasonic transducer suspension system. A transducer water bed is continuously maintained while the system is in motion across the concrete. A sealed space surrounds the transducer system, and that space is continuously flooded with water so as to keep the bottom sections of the transducers submerged. This sealed space continuously transports a sufficient amount of fluid (water) along the concrete surface for proper acoustic coupling. The ultrasonic transducer includes a granite wedge as an impedance-matching transducer faceplate material for concrete structural examinations.