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ISO RECOMMENDATION

R 597

DEFINITIONS AND TERMINOLOGY OF CEMENTS

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BRIEF HISTORY

The ISO Recommendation R 597, *Definitions and Terminology of Cements*, was drawn up by Technical Committee ISO/TC 74, *Hydraulic Binders*, the Secretariat of which is held by the Institut Belge de Normalisation (IBN).

Work on this question by the Technical Committee began in 1952 and led, in 1962, to the adoption of a Draft ISO Recommendation.

In January 1965, this Draft ISO Recommendation (No. 771) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Argentina	Ireland	Romania
Australia	Israel	Spain
Austria	Italy	Sweden
Belgium	Japan	Turkey
Czechoslovakia	Korea, Rep. of	U.A.R.
Denmark	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Hungary	Poland	U.S.S.R.
India	Portugal	Yugoslavia

Two Member Bodies opposed the approval of the Draft:

Germany
Norway

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in August 1967, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 597 August 1967

DEFINITIONS AND TERMINOLOGY OF CEMENTS

1. SCOPE

This ISO Recommendation lays down the general definitions applicable to cements, as well as the particular definitions and the denominations which pertain to each type of cement.

2. GENERAL DEFINITIONS

2.1 Cement

Finely ground material forming, by the addition of an appropriate quantity of water, a more or less liquid binding paste, capable of hardening both under water and in air and of binding together appropriate material. The compositions and denominations should be in conformity with the present ISO Recommendation.

2.2 Principal component materials

2.2.1 *Properties of principal component materials.* The principal materials used in the manufacture of cement have either hydraulic or pozzolanic properties.

Hydraulic properties. The ability of a material to set and harden in the presence of water, with formation of stable compounds.

Pozzolanic properties. The ability of a material to combine with lime at ambient temperature and in the presence of water in order to produce compounds having hydraulic properties.

2.2.2 *Portland clinker.* A product consisting mostly of calcium silicates which is obtained by heating to partial fusion a predetermined and homogeneous mixture of materials principally containing lime (CaO) and silica (SiO_2) with a smaller proportion of alumina (Al_2O_3) and iron oxide (Fe_2O_3).

2.2.3 *Blastfurnace slag*. The granulated product obtained by suddenly cooling (quenching) a melt of suitable chemical composition, resulting from the smelting of iron ore in a blastfurnace.

2.2.4 *High alumina clinker*. A product consisting mainly of calcium aluminates which is obtained by complete or partial fusion of a predetermined mixture of materials mainly containing alumina (Al_2O_3) and lime (CaO) with smaller proportions of iron oxides, silica (SiO_2) and other oxides.

2.2.5 *Pozzolana*. Originally referred to a natural volcanic material having pozzolanic properties. It is now understood to refer also to other natural and artificial materials such as diatomaceous earth, calcined clay and pulverized fuel ash, which also have pozzolanic properties.

3. PORTLAND CEMENT

3.1 Portland cement

The cement obtained by grinding Portland clinker with the possible addition of a small quantity of calcium sulphate.

NOTE. — The term "calcium sulphate" covers gypsum and its derivatives and anhydrite and other calcium sulphate products appropriate to the manufacture of cements.

3.2 Standard denomination

Portland cement.

4. CEMENTS CONTAINING BLASTFURNACE SLAG

Cements resulting from a homogeneous mixture of finely ground blastfurnace slag, Portland clinker and calcium sulphate.

4.1 Cements composed mainly of blastfurnace slag and Portland clinker

Types according to the ratio of slag to Portland clinker + slag % by mass	Standard denominations
Less than 20	Portland-blastfurnace cement 20
From 20 to 35 *	Portland-blastfurnace cement 20 to 35
From 35 * to 80 *	Portland-blastfurnace cement 35 to 80
Optional subdivisions 35 * to 60 * 60 * to 80 *	— Portland-blastfurnace cement 35 to 60 — Portland-blastfurnace cement 60 to 80
Over 85	Blastfurnace-Portland cement 85

* These percentage limits may vary in different countries by ± 5.

4.2 Cement composed mainly of blastfurnace slag and calcium sulphate

4.2.1 *Supersulphated cement.* Cement composed of blastfurnace slag and calcium sulphate with the addition of small quantities of lime, Portland clinker or Portland cement. The content of sulphuric anhydride (SO_3) is greater than 5% by mass.

4.2.2 *Standard denomination.* Supersulphated cement.

5. HIGH ALUMINA CEMENT

5.1 High alumina cement

The cement obtained by grinding high alumina clinker.

5.2 Standard denomination

High alumina cement.

6. CEMENTS CONTAINING POZZOLANA

Cements resulting from a homogeneous mixture of finely ground Portland clinker and pozzolana, with the possible addition of calcium sulphate.

6.1 Types

6.1.1 *Portland pozzolana cement*

Contains less than 20% by mass of pozzolana. It does not necessarily satisfy the test for pozzolanicity.*

6.1.2 *Pozzolanic cement*

Contains up to 40% by mass of pozzolana and satisfies the test for pozzolanicity.*

6.2 Standard denominations

— Portland pozzolana cement.

— Pozzolanic cement.

NOTE. — The word "pozzolana" can be replaced by the name of the pozzolanic material used—e.g. fly-ash-Portland cement.

7. ADDITIONS

Materials such as air-entraining agents, plasticizers, accelerators, water-repellent substances, etc. added in small quantities not exceeding 2% by mass. They should be covered by a statement of their nature completing the standard denomination of the cement.

* For the " pozzolanicity test ", an ISO Recommendation is in course of preparation (at present Draft ISO Recommendation No. 1156).