

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 679

METHOD OF TESTING STRENGTH OF CEMENTS
COMPRESSIVE AND FLEXURAL STRENGTHS
OF PLASTIC MORTAR
(RILEM-CEMBUREAU METHOD)

1st EDITION
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BRIEF HISTORY

The ISO Recommendation R 679, *Method of testing strength of cements – Compressive and flexural strengths of plastic mortar (Rilem-Cembureau method)*, 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 1964, to the adoption of a Draft ISO Recommendation.

In January 1965, the Draft ISO Recommendation (No. 772) 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
Austria	Israel	Sweden
Belgium	Italy	Turkey
Czechoslovakia	Japan	U.A.R.
Denmark	Korea, Rep. of	United Kingdom
France	Netherlands	U.S.S.R.
Germany	Norway	Yugoslavia
Hungary	Poland	
India	Portugal	

Two Member Bodies opposed the approval of the Draft :

New Zealand
U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in March 1968, to accept it as an ISO RECOMMENDATION.

METHOD OF TESTING STRENGTH OF CEMENTS
COMPRESSIVE AND FLEXURAL STRENGTHS
OF PLASTIC MORTAR
(RILEM-CEMBUREAU METHOD)

1. SCOPE

This ISO Recommendation describes the *Rilem-Cembureau* method of testing the compressive and flexural strength of plastic mortar.

2. PREPARATION OF MORTAR

2.1 Standard sand

The standard sand should be a natural, rounded, siliceous sand (with the maximum possible amount of quartz, particularly in its fine fraction). The Belgian standard sand* should be the standard reference sand.

The sand should be subdivided into three fractions : fine, medium and coarse, separated by 0.5 mm and 1 mm sieves.

The particle size distribution of the coarse, medium and fine fractions should be such that by mixing equal masses of the fractions, a sand grading is obtained which falls within the limits defined by Table 1.

If the available sands make it necessary, any other subdivision into fractions is permissible provided that the combined grading complies with the limits given in Table 1. However, sand fractions having too wide a range of particle sizes should be avoided as they may cause segregation of the mixed materials.

Each country should use those of its own current standard sieves whose aperture sizes are nearest to the six apertures specified in Table 1.

TABLE 1

Sieve aperture Square mesh mm	Cumulative retained %	Sand fraction
0.08 0.15	98 ± 2 88 ± 5	fine
0.50	67 ± 5	
1.00 1.70 2.00	33 ± 5 5 ± 5 0	coarse

* As defined in the Belgian Standard NBN 715 — *Standard sand*.

The sieve analysis of the sand should be made on a representative 100 g sample. Both the sand and the test sieves should be perfectly dry. Sieving should be continued until the amount of sand passing through each sieve is less than 0.5 g per minute.

The results obtained should be reported in the form of a curve, such as that shown in Figure 1, the aperture sizes of the sieves used being plotted on the x-axis to a logarithmic scale.

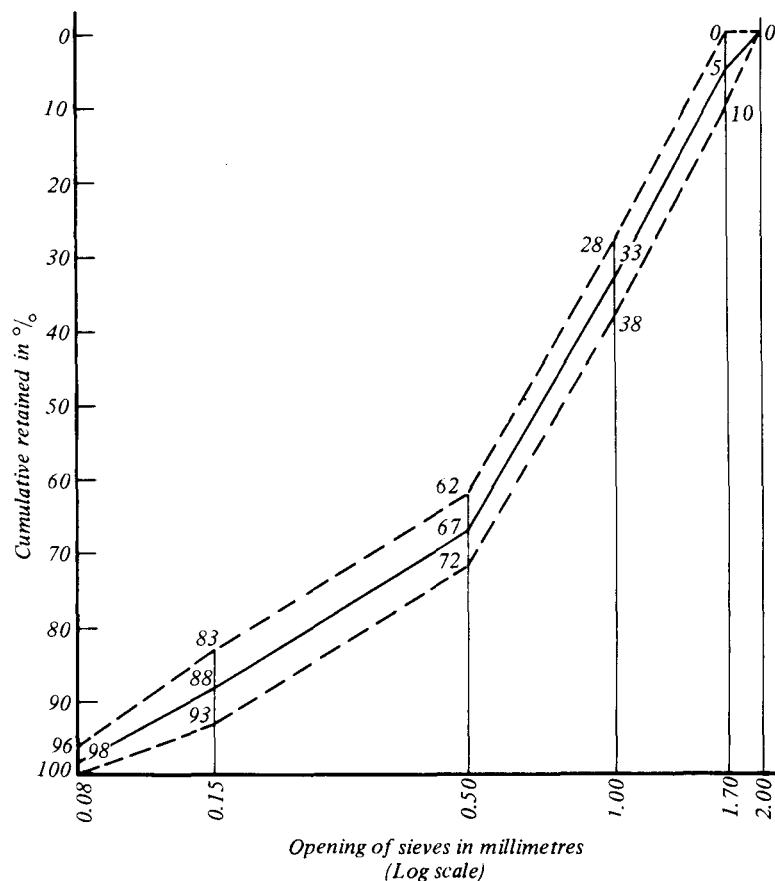


FIG. 1 – Standard sand – Particle size distribution

2.2 Composition of mortar

The proportions by mass should be one part of the cement under test, three parts of perfectly dry standard sand and one-half part drinking water (water/cement ratio = 0.50).

2.3 Preparation of mortar

Each batch should be sufficient for three test specimens, i.e. 450 g of cement, 1350 g of sand and 225 g of water. If the sand is subdivided into three equal parts, weigh in succession 450 g of the cement and 450 g of each of the coarse, medium and fine sand fractions. Weighing should be carried out by means of a balance accurate to $\pm 0.5\%$. Mixing should be done mechanically by means of the mixer shown in Figure 2. For the preparation of the mortar, the cement, sand, water, gauging room and apparatus should be at a temperature of $20 \pm 2^\circ\text{C}$. The relative humidity of the air in the gauging room should be not less than 65 %.

2.3.1 *Mixer.* The electrically-driven mixer should consist essentially of

- a stainless steel mixing bowl with a capacity of about 4.7 litres and of the shape and dimensions shown in Figure 2, and provided with means by which it can be securely fixed to the mixer frame during mixing;
- a mixer blade of the form and dimensions shown in Figure 2, revolving about its axis as it is driven in a planetary movement around the bowl by an electric motor at controlled speeds. The two directions of rotation should be opposite and the ratio between the two speeds should not be a whole number.

Dimensions in millimetres

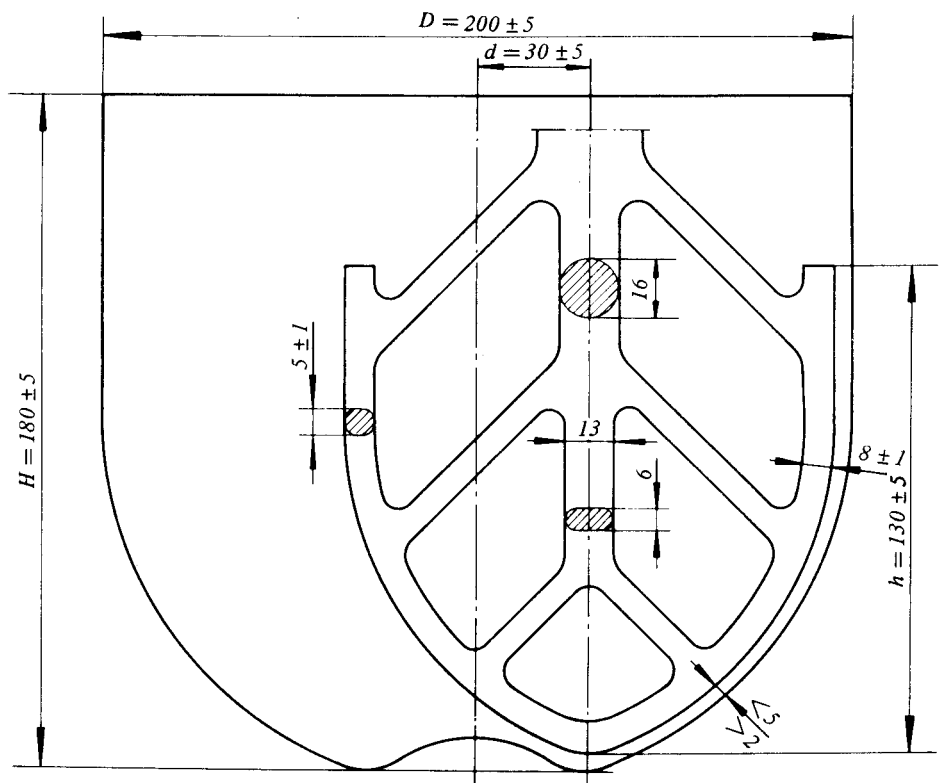


FIG. 2 – Type of mortar mixer

The following speeds should be observed during mixing.

TABLE 2

	Mixer blade revolutions per minute	Planetary movement revolutions per minute
Low speed	140 ± 5	62 ± 5
High speed	285 ± 10	125 ± 10