INTERNATIONAL STANDARD

ISO 20290-4

First edition
2019-11

Aggregates for concrete — Test methods for mechanical and physical properties —

Part 4: Determination of ten percent fines value (*TFV*)

Granulats pour béton — Méthodes d'essai relatives aux propriétés mécaniques et physiques —

Partie 4: Partie 4: Détermination de la valeur à dix pour cent de fines (TFV)

Reference number
ISO 20290-4:2019(E)

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Published in Switzerland

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Foreword

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This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 1, *Test methods for concrete*.

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Aggregates for concrete — Test methods for mechanical and physical properties —

Part 4: Determination of ten percent fines value (TFV)

1 Scope

This document gives the test method for determination of ten percent fines value (*TFV*) of aggregates. This method gives a relative measure of the resistance of the aggregate crushing under the gradually applied compressive load.

It covers two sets of procedures:

— the first procedure is applicable for aggregates tested in dry condition; and

— the second procedure is applicable for aggregates tested in a soaked condition.

NOTE 1 Generally, the test can be done under dry conditions. However, the engineer in charge can choose to test them in soaked condition, if necessary.

The method is applicable to aggregates of different strengths covering both weak and strong aggregates. It is applicable to standards aggregates, i.e. passing a 14,0 mm test sieve and retained on 10,0 mm test sieve.

National standards can also exist for the aggregate size fraction to be taken for this test. In case this definite size fraction is not available, the test can be made on other sizes, given in Annex A. The comparison of results of non-standard sizes with standard size aggregates is not possible due to lack of available data.

NOTE 2 Minor variations in grading divisions can be allowed in respective national standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

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3.1
ten percent fines value
TFV
force required to produce ten percent fines with the percentage of material passing in the range 7,5 % to 12,5 %, from Formula (1):

$$TFV = \frac{14\,F_{\max}}{m+4} \tag{1}$$

where

$F_{\max}$ is the maximum force (in kN);

m is the percentage of material passing the 2,36 mm test sieve at the maximum force.

4 Principle

A test sample of aggregates is compacted in a specified manner into a steel cylinder fitted with a freely moving plunger. The sample is then subjected to a load applied through the plunger. The aggregate gets crushed under this load. The degree of crushing depends on the crushing resistance of the aggregates, which is assessed by a sieving test on the crushed sample. The procedures repeated with various loads to determine the maximum force which generates a given sieve analysis. This maximum force is taken as the *TFV*.

5 Sampling

The sample used for the test (the laboratory sample) may be taken in accordance with the procedure described in the relevant national standards.

6 Apparatus

6.1 General apparatus

6.1.1 Compression testing machine, capable of applying any force up to 500 kN and which can be operated to give a uniform rate of loading so that this force is reached in 10 min (see 8.1.2).

6.1.2 Steel cylinder and plunger, with an open-ended steel cylinder of nominal 150 mm internal diameter and with plunger and base plate as per Figure 1 and Table 1.

Table 1 — Principal dimensions of cylinder and plunger apparatus

Component	**Dimensions** (see Figure 1)	**Nominal 150 mm internal dimeter of cylinder** mm	**Nominal 75 mm internal diameter of cylinder** (see Annex A) mm
Cylinder	Internal diameter, D_c	154 ± 0,5	78,0 ± 0,5
	Internal depth, h_c	125 to 140	70,0 to 85,0
	Minimum wall thickness, d_c	16,0	8,0

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