
**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)*

ISO 20290-4:2019

<https://standards.iteh.ai/catalog/standards/iso/002af4d7-a0fd-4cb9-af2b-70b0756f0ec0/iso-20290-4-2019>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 20290-4:2019](https://standards.iteh.ai/catalog/standards/iso/002af4d7-a0fd-4cb9-af2b-70b0756f0ec0/iso-20290-4-2019)

<https://standards.iteh.ai/catalog/standards/iso/002af4d7-a0fd-4cb9-af2b-70b0756f0ec0/iso-20290-4-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	2
5 Sampling	2
6 Apparatus	2
6.1 General apparatus	2
6.2 Additional apparatus	4
7 Preparation of test portions and specimens	4
7.1 Test portions	4
7.2 Test specimens in a dry condition	5
7.3 Test specimens in a soaked condition	5
8 Procedure	6
8.1 Aggregates in dry condition	6
8.2 Aggregates in a soaked condition	7
9 Calculations and expression of results	7
10 Test report	7
Annex A (informative) Recommended method for determining the ten per cent fines value for other size fractions of aggregate	8

iteh Standards
standards.iteh.ai
Document Preview

[ISO 20290-4:2019](https://standards.iteh.ai/catalog/standards/iso/002af4d7-a0fd-4cb9-af2b-70b0756f0ec0/iso-20290-4-2019)

<https://standards.iteh.ai/catalog/standards/iso/002af4d7-a0fd-4cb9-af2b-70b0756f0ec0/iso-20290-4-2019>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

A list of all parts in the ISO 20290 series can be found on the ISO website.

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/>

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 diameter 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