PD ISO/TS 17996:2023



BSI Standards Publication

Cheese — Determination of rheological properties by uniaxial compression at constant displacement rate

National foreword

This Published Document is the UK implementation of ISO/TS 17996:2023. It supersedes DD ISO/TS 17996:2006, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee AW/5, Chemical analysis of milk and milk products.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 24611 7

ICS 67.100.30

Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 28 February 2023.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TS 17996:2023

TECHNICAL SPECIFICATION

ISO/TS 17996

Second edition
2023-02-06

Cheese — Determination of rheological properties by uniaxial compression at constant displacement rate

Fromage — Détermination des propriétés rhéologiques par compression uniaxiale à vitesse constante de translation

Reference number
ISO/TS 17996:2023(E)

© ISO 2023



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Forewords ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **1**
5 Apparatus **2**
6 Sampling **3**
7 Procedure **4**
7.1 Thermal equilibration of test samples 4
7.2 Test portion 4
7.2.1 Location 4
7.2.2 Direction 5
7.2.3 Geometry 5
7.2.4 Cutting 5
7.2.5 Delay 6
7.3 Test conditions 6
7.3.1 Relative deformation 6
7.3.2 Crosshead speed 6
7.3.3 Number of compression cycles 6
7.3.4 Number of test portions 7
7.3.5 Measuring temperature 7
7.3.6 Nature of the interface between test portion and plates 7
8 Analysis of the compression curves **7**
8.1 Data representation and calculation 7
8.1.1 Data representation 7
8.1.2 Calculation of stress and strain 8
8.2 Parameters characterizing the compression curves 8
8.2.1 General 8
8.2.2 Modulus of deformability 9
8.2.3 Apparent fracture point 9
8.2.4 Apparent fracture work 10
8.3 Expression of results 11
9 Precision **11**
9.1 Interlaboratory test 11
9.2 Repeatability 11
9.3 Reproducibility 11
10 Test report **11**
Annex A (normative) **Non-standard sample conditions** **13**
Annex B (informative) **Examples of compression curves** **15**
Annex C (informative) **Results of interlaboratory trial with one sample** **17**
Bibliography **18**

© ISO 2023 – All rights reserved

Forewords

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 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

This second edition cancels and replaces the first edition (ISO/TS 17996:2006 | IDF/RM 205:2006), which has been technically revised, with the following changes:

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.

© ISO 2023 – All rights reserved

IDF (the International Dairy Federation) is a non-profit private sector organization representing the interests of various stakeholders in dairying at the global level. IDF members are organized in National Committees, which are national associations composed of representatives of dairy-related national interest groups including dairy farmers, dairy processing industry, dairy suppliers, academics and governments/food control authorities.

ISO and IDF collaborate closely on all matters of standardization relating to methods of analysis and sampling for milk and milk products. Since 2001, ISO and IDF jointly publish their International Standards using the logos and reference numbers of both organizations.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. IDF 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.

This document was prepared by the IDF *Standing Committee on Analytical Methods for Processing Aids and Indicators* and ISO Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*. It is being published jointly by ISO and IDF.

The work was carried out by the IDF/ISO Action Team on P18 of the *Standing Committee on Analytical Methods for Processing Aids and Indicators* under the aegis of its project leader Mr P. Watkinson (NZ).

© ISO 2023 – All rights reserved

TECHNICAL SPECIFICATION **ISO/TS 17996:2023**

Cheese — Determination of rheological properties by uniaxial compression at constant displacement rate

1 Scope

This document specifies a method for the determination of rheological properties by uniaxial compression at constant displacement rate in hard and semi-hard cheeses.

The method provides standard conditions for sampling and testing, for data representation and general principles of calculation.

NOTE Sampling can be difficult with some cheese varieties, e.g. caused by shortness, brittleness, stickiness and soft consistency. In these cases, reliable results cannot be achieved.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

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

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

3.1
rheological properties
deformation under compression of the test sample

Note 1 to entry: In accordance with the procedure specified in this document.

4 Principle

A cylindrical test sample, of defined dimensions, is compressed at a constant crosshead speed with a compression tool up to a relative deformation sufficient to determine the apparent fracture point. The force, which is the resistance of the cheese sample during compression, is measured with a load cell. The displacement may be measured either from the position of the cross head or calculated from the elapsed time multiplied by the displacement rate.

A schematic representation of the principle of the test is given in Figure 1.

© ISO 2023 – All rights reserved