

**Milk - Determination of freezing point -  
Thermistor cryoscope method (Reference  
method)**

Milk - Determination of freezing point - Thermistor  
cryoscope method (Reference method)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 5764:2002 sisaldab Euroopa standardi EN ISO 5764:2002 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.10.2002 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 5764:2002 consists of the English text of the European standard EN ISO 5764:2002.</p> <p>This document is endorsed on 18.10.2002 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p><b>Käsitlusala:</b> This International Standard specifies a reference method for the determination of the freezing point of raw, pasteurized, UHT-treated or sterilized whole milk, partially skimmed milk and skimmed milk by using a thermistor cryoscope.</p>	<p><b>Scope:</b> This International Standard specifies a reference method for the determination of the freezing point of raw, pasteurized, UHT-treated or sterilized whole milk, partially skimmed milk and skimmed milk by using a thermistor cryoscope.</p>
---	---

**ICS** 67.100.10

**Võtmesõnad:** agricultural products, congealing point, cryoscopes, dairy products, determination, food products, freezing point, measurement, milk, samples, solidification point, testing, tests, thermistors

**English version**

**Milk**

Determination of freezing point – Thermistor cryoscope method  
(Reference method)  
(ISO 5764 : 2002)

Lait – Détermination du point de  
congélation – Méthode au cryoscope  
à thermistance (Méthode de réfé-  
rence) (ISO 5764 : 2002)

Milch – Bestimmung des Gefrier-  
punktes – Thermistor-Kryoskop-  
Verfahren (Referenzverfahren)  
(ISO 5764 : 2002)

This European Standard was approved by CEN on 2002-05-04.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Management Centre: rue de Stassart 36, B-1050 Brussels**

## Foreword

International Standard

ISO 5764 : 2002 Milk – Determination of freezing point – Thermistor cryoscope method (Reference method), which was prepared by ISO/TC 34 'Agricultural food products' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 302 'Milk and milk products – Methods of sampling and analysis', the Secretariat of which is held by NEN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by November 2002 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 5764 : 2002 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

## Contents

	Page
<b>Foreword</b> .....	2
<b>Introduction</b> .....	3
<b>1 Scope</b> .....	3
<b>2 Normative references</b> .....	3
<b>3 Term and definition</b> .....	3
<b>4 Principle</b> .....	3
<b>5 Reagents</b> .....	4
<b>6 Apparatus</b> .....	5
<b>7 Sampling</b> .....	7
<b>8 Calibration of the thermistor cryoscope</b> .....	7
<b>9 Preparation of test sample</b> .....	7
<b>9.1 Preparation</b> .....	7
<b>9.2 Sample condition</b> .....	7
<b>10 Procedure</b> .....	8
<b>10.1 Preliminary checks</b> .....	8
<b>10.2 Routine calibration check</b> .....	8
<b>10.3 Determination</b> .....	8
<b>11 Calculation and expression of results</b> .....	8
<b>11.1 Calculation</b> .....	8
<b>11.2 Expression of results</b> .....	9
<b>12 Precision</b> .....	9
<b>12.1 Interlaboratory test</b> .....	9
<b>12.2 Repeatability</b> .....	9
<b>12.3 Reproducibility</b> .....	9
<b>13 Test report</b> .....	9
<b>Annex A (informative) Results of the interlaboratory test</b> .....	10
<b>Annex B (informative) Guidelines for the application of routine thermistor cryoscope methods</b> .....	12
<b>Annex C (informative) Adjustment of the freezing point value used as the reference for genuine milk</b> .....	16
<b>Bibliography</b> .....	17

## Introduction

The method described in this International Standard for the determination of the freezing point of milk uses a thermistor cryoscope, in which a thermostatically controlled device is cooled and a thermistor probe is used for the measurement of the freezing point.

This reference method requires the use of plateau-timed instruments. For routine measurements, other thermistor cryoscope methods, i.e. fixed time procedures, can be used. Guidelines for the application of other procedures are given in annex B.

## 1 Scope

This International Standard specifies a reference method for the determination of the freezing point of raw, pasteurized, UHT-treated or sterilized whole milk, partially skimmed milk and skimmed milk by using a thermistor cryoscope.

The freezing point can be used for estimating the proportion of extraneous water in milk. Calculation of the amount of extraneous water is complicated by daily variation, seasonal variation, etc. and is not within the scope of this International Standard.

Results obtained from samples with a titratable acidity exceeding 20 ml of 0,1 mol/l sodium hydroxide solution per 10 g of non-fat solids will not be representative of the original milk.

NOTE Sterilization and vacuum pasteurization can affect the freezing point of milk (see reference [6]).

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 6091, *Dried milk — Determination of titratable acidity (Reference method)*

## 3 Term and definition

For the purposes of this International Standard, the following term and definition applies.

### 3.1

#### **freezing point of milk**

value obtained using the method specified in this International Standard

NOTE The freezing point is expressed in millidegrees Celsius (m°C).

## 4 Principle

A test sample of milk is super-cooled to an appropriate temperature and crystallization is induced by means sufficient to cause an instantaneous release of heat with an accompanying warming of the sample to a temperature