

**Kolbsisepõlemismootorid.  
Plahvatusohtlikus keskkonnaks  
kasutamiseks mõeldud mootorite  
kavandamise ja valmistamise  
ohutusnõuded . Osa 1: Rühma II  
mootorid kasutamiseks süttiva gaasi ja  
auru keskkonnas**

Reciprocating internal combustion engines - Safety requirements for design and construction of engines for use in potentially explosive atmospheres - Part 1: Group II engines for use in flammable gas and vapour atmospheres

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1834-1:2000 sisaldab Euroopa standardi EN 1834-1:2000 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 17.07.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1834-1:2000 consists of the English text of the European standard EN 1834-1:2000.</p> <p>This document is endorsed on 17.07.2000 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></p> <p>This European Standard specifies the safety requirements and/or measures to remove the hazards and limit the risks on reciprocating internal combustion compression ignition engines hereinafter referred to as engines of group II categories 2 and 3 for use in potentially explosive atmospheres of flammable gas and vapour. This standard does not apply to flammable gas and vapour atmospheres containing carbon disulphide (CS<sub>2</sub>). This standard does not define requirements relating to the driven machinery. These requirements can be found in the appropriate application standards.</p>	<p><b>Scope:</b></p> <p>This European Standard specifies the safety requirements and/or measures to remove the hazards and limit the risks on reciprocating internal combustion compression ignition engines hereinafter referred to as engines of group II categories 2 and 3 for use in potentially explosive atmospheres of flammable gas and vapour. This standard does not apply to flammable gas and vapour atmospheres containing carbon disulphide (CS<sub>2</sub>). This standard does not define requirements relating to the driven machinery. These requirements can be found in the appropriate application standards.</p>
---	---

ICS 13.230, 27.020

**Võtmesõnad:**

ICS 13.220.60; 27.020

**English version**

**Reciprocating internal combustion engines – Safety  
requirements for design and construction of engines  
for use in potentially explosive atmospheres**

**Part 1: Group II engines for use in flammable gas and vapour  
atmospheres**

Moteurs alternatifs à combustion  
interne – Prescriptions de sécurité  
pour la conception et la construction  
des moteurs fonctionnant en  
atmosphère explosible – Partie 1:  
Moteurs du groupe II utilisés dans  
des atmosphères de gaz et de  
vapeurs inflammables

Hubkolben-Verbrennungsmotoren –  
Sicherheitsanforderungen für die  
Konstruktion und den Bau von  
Motoren zur Verwendung in  
explosionsgefährdeten Bereichen –  
Teil 1: Motoren der Gruppe II für  
Bereiche mit explosionsfähigen  
Gasen und Dämpfen

This European Standard was approved by CEN on 1999-07-08.

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 Central Secretariat 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 Central Secretariat 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, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

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

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Contents

<b>Foreword .....</b>	<b>3</b>
<b>0 Introduction .....</b>	<b>3</b>
<b>1 Scope .....</b>	<b>3</b>
<b>2 Normative references .....</b>	<b>4</b>
<b>3 Definitions .....</b>	<b>6</b>
<b>4 List of hazards .....</b>	<b>8</b>
<b>5 Safety requirements and/or measures .....</b>	<b>8</b>
<b>6 Verification of the safety requirements and/or measures .....</b>	<b>19</b>
<b>7 Information for use .....</b>	<b>28</b>
<b>8 Marking .....</b>	<b>30</b>
<b>Annex A (informative) Engine conditions and ignition sources .....</b>	<b>31</b>
<b>Annex B (informative) Exhaust flame arrester elimination test procedure .....</b>	<b>34</b>
<b>Annex C (informative) Relation between zones and engines categories .....</b>	<b>36</b>
<b>Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives .....</b>	<b>36</b>

## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 270 "Internal combustion engines", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The standards prepared by CEN/TC 270 are specific to internal combustion engines and supplement those A and B standards concerned with safety.

Normative and informative annexes to this standard are indicated in the contents list. General Safety requirements for internal combustion engines are given in EN 1679-1:1998.

## 0 Introduction

This European standard has been prepared to be a harmonised standard to provide one means of conforming with the essential safety requirements of the Machinery (98/37/EEC) and ATEX (94/9/EEC) Directives, and associated EFTA regulations. This European standard is a type C standard as defined in EN 292:1991.

The extent to which hazards are covered are indicated in the scope of this standard. In addition, machinery shall comply as appropriate with part 1 and 2 of EN 292:1991 for hazards which are not covered by this standard.

The requirements of this standard apply to designers, manufacturers, suppliers and importers of reciprocating internal combustion engines.

This standard also contains the information to be provided by the manufacturer to the user of reciprocating internal combustion engines.

## 1 Scope

This European standard specifies the safety requirements and/or measures to remove the hazards and limit the risks on reciprocating internal combustion compression ignition engines hereinafter referred to as "engines" of group II categories 2 and 3 for use in potentially explosive atmospheres of flammable gas and vapour.

This European standard does not apply to flammable gas and vapour atmospheres containing carbon disulphide (CS<sub>2</sub>).

This European standard does not define requirements relating to the driven machinery. These requirements can be found in the appropriate application standards.

This European standard does not apply to engines used in premises for the processing manufacture or storage of explosives.

The safety requirements for engines for use in potentially explosive atmospheres for underground applications are given in EN 1834-2:2000.

The safety requirements for engines for used in explosive atmospheres with combustible dust are given in EN 1834-3:2000.

This European standard does not apply to spark ignition engines.

The hazards applicable are listed in 4 and relate to the additional hazards of operation in an atmosphere that may become explosive. The tests which the engine and its ancillary fittings are required to undergo to verify compliance with this specification are detailed in this standard.

General safety requirements i.e. those common to all RIC engines, are covered in EN 1679-1:1998.

This European standard is applicable to engines which are manufactured after the date of issue of this standard.

## 2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of, any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1	1991	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN 292-2:1991/+A1:1995		Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications
EN 1050	1996	Safety of machinery – Principles for risk assessment
EN 1127-1	1997	Explosive atmospheres - Explosion prevention and protection – Part 1: Basic concepts and methodology
EN 1679-1	1998	Reciprocating internal combustion engines - Safety - Part 1: Compression ignition engines
EN 1834-3	2000	Reciprocating internal combustion engines - Safety requirements for design and construction of engines for use in potentially explosive atmospheres - Part 3: Group II engines for use in flammable dust atmospheres



EN 50014	1997	Electrical apparatus for potentially explosive atmospheres – General requirements
EN 50015	1994	Electrical apparatus for potentially explosive atmospheres – Oil immersion "o"
EN 50016	1995	Electrical apparatus for potentially explosive atmospheres - Pressurised apparatus "p"
EN 50017	1994	Electrical apparatus for potentially explosive atmospheres - Powder filling "q"
EN 50018	1994	Electrical apparatus for potentially explosive atmospheres - Flameproof enclosures "d"
EN 50019	1994	Electrical apparatus for potentially explosive atmospheres - Increased safety "e"
EN 50020	1994	Electrical apparatus for potentially explosive atmospheres - Intrinsic safety "i"
prEN 50021	1998	Electrical apparatus for potentially explosive atmospheres - Type of protection "n"
EN 50028	1987	Electrical apparatus for potentially explosive atmospheres - Encapsulation "m"
EN 50039	1980	Electrical apparatus for potentially explosive atmospheres - Intrinsic safety systems "i"
prEN 50154	1993	Electrical installations in potentially explosive gas atmospheres (other than mines)
ISO 1813	1979	Antistatic endless V belts - Electrical conductivity - Characteristics and method of test
ISO 2710	1978	Reciprocating internal combustion engines - Vocabulary
ISO 3046-3	1989	Reciprocating internal combustion engines - Performance - Part 3: Test measurements
ISO 7967-1	1987	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 1: Structure and external covers
ISO 7967-2	1987	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 2: Main running gear
ISO 7967-3	1987	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 3: Valves, camshaft drive and actuating mechanisms
ISO 7967-4	1988	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 4: Pressure charging and air/exhaust gas ducting systems

ISO 7967-8	1994	Reciprocating internal combustion engines - Vocabulary of components and systems - Part 8: Starting systems
ISO 9563	1990	Belt drives - Electrical conductivity of antistatic endless synchronous belts - Characteristics and test method
IEC 60243-1	1996	Methods of test for electric strength of solid insulating materials - Part 1: Tests at power frequencies

### **3 Definitions**

For the purposes of this standard, the definitions in ISO 2710:1978 and ISO 7967-1:1987, ISO 7967-2:1987, ISO 7967-3:1987, ISO 7967-4:1988 and ISO 7967-8:1994 and the following definitions apply:

#### **3.1 Explosive atmosphere**

A mixture with air, under atmospheric conditions of combustible material in the form of gas, vapour, mist or dust, in which after ignition, combustion spreads throughout the unconsumed mixture.

NOTE: See 3.15 in EN 1127-1:1997. For the purposes of this standard dust is excluded.

#### **3.2 Zones for gas and vapour**

The definitions given in 6.4.2 of EN 1127-1:1997 apply.

#### **3.3 Potentially explosive atmosphere**

An atmosphere which could become explosive due to local and operational conditions.

#### **3.4 Categories**

Category 2 and 3 of equipment group II are defined in annex 1 of the ATEX Directive. In the meaning of ATEX directive RIC engines are equipments.

NOTE: The letter G is included to identify engines designed according to this European Standard