
**Safety of machinery — Evaluation of the
emission of airborne hazardous
substances —**

**Part 2:
Tracer gas method for the measurement
of the emission rate of a given pollutant**

*Sécurité des machines — Évaluation de l'émission de substances
dangereuses véhiculées par l'air —*

*Partie 2: Méthode par gaz traceur pour le mesurage du taux d'émission
d'un polluant donné*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 29042-2 was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

ISO 29042 consists of the following parts, under the general title *Safety of machinery — Evaluation of the emission of airborne hazardous substances*:

- *Part 1: Selection of test methods*
- *Part 2: Tracer gas method for the measurement of the emission rate of a given pollutant*
- *Part 3: Test bench method for the measurement of the emission rate of a given pollutant*
- *Part 4: Tracer method for the measurement of the capture efficiency of an exhaust system*

The following parts are under preparation:

- *Part 5: Test bench method for the measurement of the separation efficiency by mass of air cleaning systems with unducted outlet*
- *Part 6: Test bench method for the measurement of the separation efficiency by mass of air cleaning systems with ducted outlet*
- *Part 7: Test bench method for the measurement of the pollutant concentration parameter*

A room method for the measurement of the pollutant concentration parameter and a decontamination index are to form the subjects of future parts 8 and 9.

Introduction

The structure of safety standards in the field of machinery is as follows:

- a) type-A standards (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;
- b) type-B standards (generic safety standards) dealing with one safety aspect or one type of safeguard that can be used across a wide range of machinery:
 - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
 - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure-sensitive devices, guards);
- c) type-C standards (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This part of ISO 29042 is a type-B standard as stated in ISO 12100-1.

The requirements of this document can be supplemented or modified by a type-C standard.

For machines which are covered by the scope of a type-C standard and which have been designed and built according to the requirements of that standard, the requirements of that type-C standard take precedence.

ISO/TC 199 has a mandate in this area to produce type-A and type-B standards, which will allow verification of conformity with the essential safety requirements.

ISO 29042-2 is based on EN 1093-2:2006, amended by Amendment 1:2008, published by the European Committee for Standardization (CEN).

Safety of machinery — Evaluation of the emission of airborne hazardous substances —

Part 2:

Tracer gas method for the measurement of the emission rate of a given pollutant

1 Scope

This part of ISO 29042 specifies a method using tracer gas techniques to enable measurement of the emission rates of gaseous substances from a single machine whose operation can be controlled.

It is not applicable to machinery manufactured before the date of publication of this part of ISO 29042.

2 Normative references

The following referenced documents are indispensable for the application 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 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 29042-1:2008, *Safety of machinery — Evaluation of the emission of airborne hazardous substances — Part 1: Selection of test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100-1 and ISO 29042-1 and the following apply.

3.1

tracer gas technique

use of gaseous substances with an aerodynamic behaviour comparable with the gaseous hazardous substance under consideration and for which concentrations can be reliably measured

4 Principle

The principle is based on the use of a tracer gas generated at a known and constant emission rate to provide the best representation of the pollutant source. The mean tracer gas and pollutant concentrations are measured in the vicinity of the source. Assuming that the aerodynamic behaviour of the pollutant is equal to that of the tracer gas, the pollutant emission rate can be determined.