PD ISO/TS 12103-3:2023

BSI Standards Publication

Road vehicles — Test contaminants for filter evaluation

Part 3: Soot contaminant

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National foreword

This Published Document is the UK implementation of ISO/TS 12103-3:2023. It supersedes PD ISO/TS 12103-3:2020, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/22, Engines for road vehicles.

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

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Part 3: Soot contaminant

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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.

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).

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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 22, *Road Vehicles*, Subcommittee SC 34, *Propulsion, powertrain and powertrain fluids*.

This second edition cancels and replaces the first edition (ISO/TS 12103-3:2020), which has been technically revised.

The main changes are as follows:

— modification to requirement regarding analysis equipment;

— modification to requirement regarding instrument calibration.

A list of all parts in the ISO 12103 series can be found on the ISO website.

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.

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Introduction

This document specifies a grade of test aerosol, which is composed of soot from a combustion source similar to soot occurring in the environment that motor vehicles are commonly subjected to. This test contaminant is developed for air filter media and element testing.

Ambient aerosols include at least two distinct modes of aerosol: a sub-micron mode and a super-micron mode. Generally, the sub-micron mode comes from combustion sources or condensation of gases. The super-micron mode comes from physical abrasion processes and wind-blown dust. The test dusts described in ISO 12103-1 can be used to simulate the super-micron mode of ambient aerosol for testing air filters. The soot aerosol described in this document is intended to simulate the sub-micron mode of ambient aerosol.

There are several possible methods of generating soot aerosol, to simulate the sub-micron mode for air filter testing purposes such as dispersing soot from a powder or using generated soot from a combustion process.

Particle size of soot dispersed from bulk powder exceeds the environmental soot considerably.

For generated soot from a combustion process, a new procedure is described in this document. Using aliphatic hydrocarbons, the soot consists of a combination of carbon, organic hydrocarbons and other substances.

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1 Scope

This document defines particle size distribution by number and chemical content limits involving one grade of test aerosol made from combustion soot.

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 15900, *Determination of particle size distribution — Differential electrical mobility analysis for aerosol particles*

ISO 29904:2013, *Fire chemistry — Generation and measurement of aerosols*

NIOSH *Elemental carbon (diesel particulate): Method 5040, Issue 3*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15900, ISO 29904 and the following 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
diffusion flame
flame from a burner which gets its oxygen from the ambient surrounding air by diffusion and convection mechanisms instead of having the oxygen forcibly premixed into the fuel

3.2
generation
process in which airborne particles are produced and injected into a defined airstream

3.3
mobility particle size
particle size provided by an electro-static classifier

Note 1 to entry: The method is based on a principle that uses the forces exerted on charged particle in an electro-static field. The method is used for particles in the nm range and the classifier is typically combined with a condensation particle counter to actually determine the concentration.

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