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Interested committees:

Title: BS ISO 18553 Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 18553

Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds

*Méthode d'estimation de la dispersion du pigment et du noir
de carbone dans les tubes, raccords et compositions à base de
polyoléfines*

ICS: 23.040.45; 23.040.20

ISO/TC 138/SC 5

Secretariat: **NEN**

Voting begins on:
2024-02-12

Voting terminates on:
2024-05-06

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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 138, (*Plastics pipes, fittings and valves for the transport of fluids*), Subcommittee SC 5, (*General properties of pipes, fittings and valves of plastic materials and their accessories — Test methods and basic specifications*).

This second edition cancels and replaces the first edition, which has been technically revised.

The main changes compared to the previous edition are as follows:

- the microtome method for preparing test pieces has been made the primary method, but the compression method remains an option.
- for testing of materials samples can be taken from pellet, molded sheet or melt index extrudate, using test pieces cut by microtome.
- more prescriptive descriptions of preparing samples and test pieces from pipe and fittings has been given.
- the magnification to be used to assess the size of particles and agglomerates is no longer specified, a magnification appropriate to allow identification of the different size ranges is to be used.
- for the rating of appearance, a more precise evaluation is given.

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.

Introduction

Thermoplastic products manufactured for pipeline systems are normally pigmented. Typically, fine carbon black particles or pigments are used. These are normally incorporated into the raw material prior to either extrusion of pipe or injection molding of pipe fittings. The purpose of coloring is to allow identification of the pipeline in service and, in the case of carbon black, to act as protection of the polymer from degradation by ultra-violet light if the product is stored outdoor or used for outdoor service. It is important that the carbon black or pigment particles are correctly dispersed in the polymer, and hence the final product, to ensure that the physical, mechanical and surface protection properties are maintained. Correct dispersion may also be an indication that antioxidants and ultra-violet stabilizers are correctly dispersed, and that the size of agglomerates or particles is not excessive.

This method provides procedures for assessing the degree of dispersion by physical measurement of the size of the dispersed particles and arithmetic grading the particle size distribution. It also provides photographs for comparison with microscopic images of samples taken from raw-material compound or products in order to judge subjectively the acceptability of carbon black or pigment dispersion.

A recommended limit of grading of particles/agglomerate size and for an acceptable rating of appearance is given in [annex D](#).

It is noted that this method supersedes and merges previously published individual methods for assessment of carbon black and pigment dispersion (see the foreword).

Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds

1 Scope

This document describes a method with two procedures for the assessment of carbon black or pigment particle and agglomerate size, and the rating of dispersion in polyolefin pipes, fittings, and compounds.

The method is applicable to polyolefin pipes and fittings, as well as raw material in pellet form, with the choice of procedure to be determined by the referring specification.

The method is applicable to carbon black or pigmented polyolefin pipes, fittings, and compounds with a carbon black content of less than 3 % by weight, and pigment content of less than 5 % by weight.

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 293:2004, *Plastics — Compression molding of test specimens of thermoplastic materials*

ISO 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method*

3 Terms and definitions

No terms and definitions are listed in this document.

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/>

4 Principle

Small samples of raw-material pellet, melt index extrudate, compression moulded sheet, or material removed from the pipe or fitting are taken for assessment. Microtome slices are cut from the samples for examination. Alternatively, samples are heated and compressed between microscope slides for examination.

The test pieces produced are examined microscopically and the sizes of particles and agglomerates are measured, recorded, and graded by comparison with a tabulated grading system (see [Table A.1](#)).

A particle/agglomerate size grading is determined from an average of the gradings determined for six test pieces.

If required, a rating of the appearance of the dispersion is determined by comparison with photomicrographs (see [Annex B](#)).