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## **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*



Reference number  
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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 18553 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 International Standard cancels and replaces ISO 11420:1996, *Method for the assessment of the degree of carbon black dispersion in polyolefin pipes, fittings and compounds*, and ISO 13949:1997, *Method for the assessment of the degree of pigment dispersion in polyolefin pipes, fittings and compounds*, which have been combined into a single document.

Annexes A and B form a normative part of this International Standard. Annexes C and D are for information only.

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## Introduction

Thermoplastic products manufactured for pipeline systems are normally coloured. Typically fine carbon black particles or coloured pigments are used. These are normally incorporated into the raw material prior to either extrusion of pipe or injection moulding of pipe fittings. The purpose of colouring is to allow identification of the pipeline in service and also, in the case of carbon black, to act as protection of the polymer from degradation by ultra-violet light if the product is stored externally or used for external 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 anti-oxidants and ultra-violet stabilizers are correctly dispersed, and that the size of agglomerates of 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 arithmetically 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 a list of the photographs from annex B 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).