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**Sampling and test method for  
cleanable filter media taken from  
filters of systems in operation**

*Échantillonnage et méthode d'essai pour médias filtrants  
décolmatables prélevés sur des filtres de systèmes en exploitation*

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Published in Switzerland

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## Foreword

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This document was prepared by Technical Committee ISO/TC 142, *Cleaning equipment for air and other gases*.

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## Introduction

The main purpose of using dust collector systems is to remove dust particles from dirty gases. The dry type filtering dust collectors, known as bag filters, are one of the most widespread industrial dust collectors and are used in applications such as municipal garbage incinerators, coal fired boilers, iron making, cement factories, power plants, etc. Especially, in municipal garbage incinerators, bag filters have been used frequently to overcome dioxin emission<sup>[1],[2]</sup>.

Since filter media are used under various gas and dust conditions for a long time, their physical and chemical properties change (deteriorate) with operating time due to various causes<sup>[3]-[12]</sup>. The important filter characteristics such as collection performance and residual pressure drop change with the operation period. Since users of bag filter systems have usually evaluated the parameters associated with the change in the filter properties with their own methods, the results obtained were not easily compared with each other. For this reason, the establishment of a standard for operation, management, and maintenance of filter systems is important to allow prediction of the timing of replacement and/or service life time of filter media.

Changes in the physical and chemical properties of the filter medium, i.e., physical and chemical degradation are caused by many factors, such as heat, particle accumulation, reaction with corrosive gases and deposited particles, and mechanical reasons like clogged weave openings and increasing size of weave openings, the combination of those factors and so on. The filter medium damage can be analysed through the fault tree analysis in [Annex A](#). Clogged weave openings reduce the permeability of the filter medium; and increasing the size of weave openings lessens the collection performance of the filter medium. The reaction with corrosive gases and deposited particles changes properties of the filter fibre material itself and decreases the tensile strength, tenacity, flexibility of the filter medium and so on. These changes cause mostly adverse effects to the filter medium. This can result in the breakage of filter media and leakage of dust to the atmosphere.

Therefore, since it is important to evaluate the property changes of filter media in order to predict the timing of replacement and/or service life time, ISO 16891, which specifies test methods for evaluating degradation of tensile stress of cleanable filter media, has been published. However, test methods for other evaluation parameters such as permeability, collection efficiency, fibre diameter of used filter media, mass and size distribution of deposited particles, have not yet been specified.

Industrial bag filter systems, in general, handle large amounts of dirty gas so that a system with a large number of filter elements in parallel is needed to remove the dust. The degree of degradation of filter properties depends on the location of the filter in the system because the dirty gas usually enters the system in an irregular flow pattern. Furthermore, the method used for sampling and storage of the used filter, and the preparation method of the test specimen should be defined. By standardizing these test methods, it is possible to accurately assess the deterioration of individual filter media.

This document provides a standard method for sampling filter elements from a dust collector system in operation, and a test method for monitoring sampled filter elements and the system through measurement of basic filter properties.