

English Version

**Photocatalysis - Continuous flow test methods - Part 1:  
Determination of the degradation of nitric oxide (NO) in  
the air by photocatalytic materials**

Photocatalyse - Méthodes d'essai en flux continu -  
Partie 1 : Détermination de la dégradation du  
monoxyde d'azote (NO) dans l'air par des matériaux  
photocatalytiques

Photokatalyse - Prüfverfahren mit kontinuierlichem  
Durchfluss - Teil 1: Bestimmung des Abbaus von  
Stickstoffmonoxid (NO) aus der Luft durch  
photokatalytische Werkstoffe

This Technical Specification (CEN/TS) was approved by CEN on 8 August 2016 for provisional application.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (CEN/TS 16980-1:2016) has been prepared by Technical Committee CEN/TC 386 “Photocatalysis”, the secretariat of which is held by AFNOR.

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This document is part of the CEN/TS 16980 series that consists of the following parts:

- Part 1: *Determination of the degradation of nitric oxide (NO) in the air by photocatalytic materials*
- Part 2: [To be determined].

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom

## 1 Scope

This standard describes a method for assessing the performance of photocatalytic inorganic materials contained in cement mortars and/or limes or ceramic-based matrices, paints or materials deposited as thin films or coatings on a variety of substrates for the photocatalytic abatement of nitric oxide in the gas phase. This method is not suitable for the assessment of samples to be applied with flow perpendicular to the surface or flow permeating the surface itself as polymeric and paper filters, honeycomb structures and suchlike.

The performance for the photocatalytic sample under test is evaluated by measuring the degradation rate of nitric oxide (NO) using the method described herein. The photocatalytic abatement rate is calculated from the observed rate by eliminating the effects of mass transfer. The intrinsic photocatalytic abatement rate is an intrinsic property of the material tested and makes it possible to distinguish the photocatalytic activities of various products with an absolute scale defined with physical and engineering meaning.

For the measurements and calculations described in this standard the concentration of nitrogen oxides (NO<sub>x</sub>) is defined as the stoichiometric sum of nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).

### Safety statement

Persons using this document should be familiar with the normal laboratory practice, if applicable. This document cannot address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

### Environmental statement

It is understood that some of the material permitted in this standard may have negative environmental impact. As technological advantages lead to better alternatives for these materials, they will be eliminated from this standard to the extent possible.

At the end of the test, the user of the standard will take care to carry out an appropriate disposal of the wastes, according to local regulation.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CEN/TS 16599:2014, *Photocatalysis - Irradiation conditions for testing photocatalytic properties of semiconducting materials and the measurement of these conditions*

EN ISO 9169, *Air quality - Definition and determination of performance characteristics of an automatic measuring system (ISO 9169)*

ISO 7996, *Ambient air — Determination of the mass concentration of nitrogen oxides — Chemiluminescence method*