
**Generation and analysis of toxic gases in
fire — Calculation of species yields,
equivalence ratios and combustion
efficiency in experimental fires**

*Production et analyse des gaz toxiques dans le feu — Calcul des taux
de production des espèces, des rapports d'équivalence et de l'efficacité
de combustion dans les feux expérimentaux*

www.iso.org/standard



Reference number
ISO 19703:2010 (E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 0111
Fax + 41 22 749 0947
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and units	3
5 Appropriate input data required for calculations	4
5.1 Data handling	4
5.2 Test specimen information	5
5.3 Fire conditions	5
5.4 Data collection	6
6 Calculation of yields of fire gases and smoke, stoichiometric oxygen demand and recovery of key elements	6
6.1 Calculation of measured yields from fire gas concentration data	6
6.2 Calculation of notional gas yields	9
6.3 Calculation of recovery of elements in key products	12
6.4 Calculation of stoichiometric oxygen demand	12
6.5 Calculation of smoke yields	20
7 Calculation of equivalence ratio	23
7.1 General	23
7.2 Derivation of ϕ for flow-through, steady-state experimental systems	24
7.3 Derivation of ϕ for flow-through, calorimeter experimental systems	25
7.4 Derivation of ϕ for closed chamber systems	26
7.5 Derivation of ϕ in room fire tests	26
8 Calculation of combustion efficiency	26
8.1 General	26
8.2 Heat release efficiency	27
8.3 Oxygen consumption efficiency	28
8.4 Oxides of carbon method	30
Bibliography	34