Designation: F1186 – 18

Standard Classification System for Chemicals According to Functional Groups[1]

This standard is issued under the fixed designation F1186; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This standard provides a classification system for chemical compounds whereby chemicals are assigned a three-digit code based primarily on chemical class.[2] Poly-functional compounds should be classified by all applicable code numbers associated with their component functional groups.

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Significance and Use

2.1 In many situations where chemicals are interacting with other chemicals or materials, the interaction is strongly dependent and often correlated with the functional group(s) present. These interactions include chemical reaction, dissolution, and swelling/permeation of polymeric materials. For this reason, it is useful to have a standard means for classifying chemicals.

2.2 One application for this classification system is in the selection of chemical protective clothing based on the chemical resistance of the clothing materials.[3,4,5] Chemical resistance data are available for only a very small fraction of the chemicals for which protective clothing is used. However, for chemicals for which no data are available, a knowledge of the chemical class sometimes can give insight into the resistance of a prospective clothing material.

NOTE 1—The present state of knowledge precludes reliable estimates from chemical class alone.

2.3 The classification system also facilitates the development of predictive methodology by researchers in a variety of fields, in addition to protective clothing.

3. Terminology

3.1 *Definitions:*

3.1.1 *functional group*—the atom or group of atoms that defines the chemical class of a particular family of organic compounds and, at the same time, determines their properties.

4. Basis of Classification

4.1 Three-digit numbers were assigned to each class. The major classes generally were a multiple of 10 (printed in bold type), with subclasses numbered between.

4.2 Subcommittee F23.30 has jurisdiction for designating new classes. Proposals should be made to that group. The list will be updated periodically through the ASTM balloting process as needed; interim lists will be made immediately available from the subcommittee.

4.3 See Annex A1 for the classification system.

5. Keywords

5.1 chemical classification; chemical resistance; chemicals; clothing; functional; groups; protective

[1] This classification system is under the jurisdiction of ASTM Committee F23 on Personal Protective Clothing and Equipment and is the direct responsibility of Subcommittee F23.30 on Chemicals.

Current edition approved June 1, 2018. Published June 2018. Originally approved in 1988. Last previous edition approved in 2013 as F1186 – 03 (2013). DOI: 10.1520/F1186-18.

[2] Classification in this guide is based on assignment of three-digit codes, originally found in the *Guidelines for the Selection of Chemical Protective Clothing,* 3rd Ed. (Vols I and II), Schwope et al. NTIS Accession Nos. ADA179 516 and ADA179 164, to the groups listed in the Functional Group Index, Kodak Laboratory Chemicals, Kodak Laboratory Products Catalog No. 53, 1987–1988, pp. 1f–30f.

[3] *Chemical Protective Clothing Permeation and Degradation Database*, K. Forsberg et al., Lewis Publisher, CRC Press Inc., Boca Raton, FL 33431-9964.

[4] *Guidelines for the Selection of Chemical Protective Clothing*, Johnson et al., U.S. Dept. of Energy Report DE-02357T, 1991.

[5] *Quick Selection Guide to Chemical Protective Clothing*, 5th ed., Forsberg and Mansdorf, John Wiley and Sons, Inc., Hoboken, NJ, 2007, ISBN 978-0-470-14681-1.