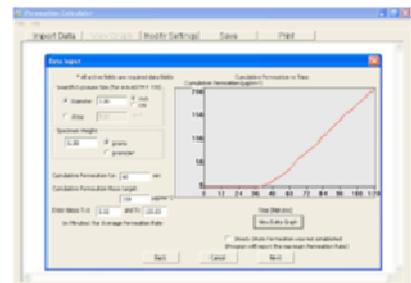


Development of a Java-based Permeation Calculator FY15 (93902JU)

Objective

The objective of this project is to develop a Java-based Permeation Calculator for re-approval of the ASTM F2815 standard every 5 years as required by ASTM International.



Applicable Standards

- ASTM F2815-10 (2014)
- ANSI/ISEA 105-2011



Standard Practice for
Chemical Permeation through Protective Clothing Materials:
Testing Data Analysis by Use of a Computer Program¹

This standard is issued under the fixed designation F2815; the number immediately following the designation indicates the year of original adoption or, in the case of revisions, the year of last revision. A number in parentheses indicates the year of last approval. A superscript symbol (1) indicates an editorial change since the last revision or approval.

Key Partners

- ASTM
- ISEA Hand Protection Group

Stakeholders

- ASTM
- ISEA and manufacturers
- Protective clothing users
- Healthcare workers

1. Scope

1.1 This practice covers the calculations of all the permeation parameters related to Test Method F739, ISO 6529, and Practice D6978 standards by use of a computer program, referred to as "Permeation Calculator" (DHHS (NIOSH) Publication No. 2007-143C).^{1,2}

1.2 The practice is applicable to both open loop and closed loop permeation tests. The closed loop test includes continuous sampling and discrete sampling. The discrete sampling includes tests when sample volume is replaced and also when sample volume is not replaced. For an open loop permeation test, the computer program also allows permeation data files with variable sampling flow rate. Refer to Test Method F739 for more details about the different types of the permeation testing systems.

1.3 This practice is applicable to the most typical permeation behavior, that is, Type A, where the permeation rate stabilizes at a "steady-state" value. It does not apply to the other types of permeation behaviors. Refer to Test Method F739 for more details about the various permeation behaviors.

1.4 This practice is not applicable to Test Method F1383 because the permeation behavior is different under conditions

2. Referenced Documents

2.1 ASTM Standards³

D9078 Practice for Assessment of Resistance of Medical Gloves to Permeation by Chemotherapy Drugs

F739 Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact

F194 Guide for Documenting the Results of Chemical Permeation Testing of Materials Used in Protective Clothing

F1383 Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Intermittent Contact

F1494 Terminology Relating to Protective Clothing

2.2 ISO Standards²

ISO 6529 Protective Clothing—Protection against Chemicals—Determination of Resistance of Protective Clothing Materials to Permeation by Liquids and Gases

3. Terminology

3.1 Definitions

3.1.1 mechanical resistance of a membrane substance that

Project Scope

- Develop the Java-based Permeation Calculator
- Revise ASTM F2815 standard
- Modify the new computer program based on NIOSH internal review comments and ASTM F23 ballots
- Update the NIOSH/CDC website on the Permeation Calculator (currently <http://www.cdc.gov/niosh/docs/2007-143C/>), including new Program Description, Operating Instructions, Screen Shots, etc.

Milestones FY15

- Q1. Literature review
- Q2. Identification of software and hardware that are needed for the development
- Q3. Development of draft computer program
- Q4. Evaluation of the draft computer program with permeation data files

Outputs

- ASTM standard F2815-10 on the window-based Permeation Calculator obtained re-approval at the 1st, now ASTM F 2815-10 (2014)
- New NIOSH webpage for the Permeation Calculator
- Peer-reviewed paper
- National/international conference presentations

Outcomes

- Next re-approval of ASTM standard F2815 -10 (2019) with the Java-based Permeation Calculator
- Extend users for not only PC but also Macintosh computer users
- Create a unified and defined way for automating and standardizing permeation testing data analysis
- Promote effective workplace health protection (NORA priority goal)
- Other researchers utilize the software to conduct further research

Updated: 17 Feb 2015