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APPENDIX 14-1 ASTM METHODS APPLICABLE TO PROTECTIVE CLOTHING

Test Methods for **Physical Properties**

F 1790	Measuring **Cut Resistance** of Materials Used in Protective Clothing
F 1414	Measurement of **Cut Resistance** to Chain Saw in Lower Body (Legs) Protective Clothing
F 1458	Measurement of **Cut Resistance** to Chain Saw of Foot Protective Devices
F 1358	Effects of **Flame** Impingement on Materials Used in Protective Clothing Not Designated Primarily for Flame Resistance
F 955	Evaluating **Heat Transfer** Through Materials for Protective Clothing Upon Contact with Molten Substances
F 1291	Measuring **Thermal** Insulation of Clothing Using a Heated Mannequin
F 1060	**Thermal** Protective Performance of Materials for Protective Clothing for Hot Surface Contact
F 1342	Protective Clothing Material Resistance to **Puncture**
D 1117	Nonwoven Fabrics (**Abrasion, Breaking, Bursting, Seam Strength, Rigidity, Tear, Thickness**)
D 3389	Coated Fabrics **Abrasion Resistance** (Rotary Platform, Double-Head Abrader) D 2136 Coated Fabrics-Low-Temperature Bend Test (**Brittleness**)
D 2137	Rubber Property-**Brittleness** Point of Flexible Polymers and Coated Fabrics
D 746	**Brittleness** Temperature of Plastics and Elastomers by Impact
D 3787	**Bursting Strength** of Knitted Goods-Constant-Rate-of-Traverse (CRT) Ball Burst Test
D 1230	**Flammability** of Apparel Textiles
D 4723	Descriptions of Textile Heat and **Flammability** Test Methods and Performance Specifications
D 4804	Determining the **Flammability** Characteristics of Nonrigid Solid Plastics
D 671	Flexural **Fatigue** of Plastics by Constant-Amplitude-of-Force
D 430	Rubber Deterioration-Dynamic **Fatigue**
D 1683	Failure in Sewn Seams of Woven Fabrics
D 1043	**Stiffness** Properties of Plastics as a Function of Temperature by Means of a Torsion Test
D 1053	Rubber Property-**Stiffening** at Low Temperatures Flexible Polymers and Coated Fabrics
D 1388	**Stiffness** of Fabrics

APPENDIX 14-1 ASTM METHODS APPLICABLE TO PROTECTIVE CLOTHING (Cont.)

D 4032	**Stiffness** of Fabric by the Circular Bend Procedure
D 2582	Puncture-Propagation **Tear Resistance** of Plastic Film and Thin Sheeting
D 412	Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-**Tension**
D 2261	**Tearing** Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)
D 2061	Strength Tests for **Zippers**

Test Methods for **Chemical Resistance**

F 903	Resistance of Protective Clothing Materials to **Penetration** by Liquids
F 1052	Pressure Testing of Vapor Protective Ensembles (Gas **Penetration**)
F 1359	Liquid **Penetration** Resistance of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin
F 739	Resistance of Protective Clothing Materials to **Permeation** by Liquids or Gases
F 1407	Resistance of Chemical Protective Clothing Materials to Liquid-**Permeation** Cup Method
F 1383	Resistance of Protective Clothing Materials to Liquids or Gases Under Conditions of Intermittent Contact (**Permeation**)
D 518	Rubber Deterioration-Surface **Cracking**
F 484	Stress **Crazing** of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds
D 543	Evaluating the Resistance of Plastics to Chemical Reagents (**Degradation**)
D 3395	Rubber Deterioration-Dynamic **Ozone** Cracking in a Chamber
D 471	Rubber Property-Effect of Liquids (**Swelling and Solubility**)
D 1746	**Transparency** of Plastic Sheeting

Test Methods for **Aerosol** Penetration Resistance

F 1819	Test Method for Resistance of Materials used in Protective Clothing to Penetration by Synthetic **Blood** Using a Mechanical Pressure Technique
F 1671	Resistance of Materials Used in Protective Clothing to Penetration by **Blood-Borne Pathogens** Using ϕ-X174 Bacteriophage Penetration as a Test System

APPENDIX 14-1 ASTM METHODS APPLICABLE TO PROTECTIVE CLOTHING (Cont.)

F 1671	Resistance of Protective Gloves to Penetration by **Blood-Borne Pathogens** Using ϕ-X174 Bacteriophage Penetration as a Test System
F 1862	Resistance of Medical Face Masks to Penetration by Synthetic Blood (Horizontal Projection of Fixed Volume at a Known Velocity)
F 1670	Resistance of Materials Used in Protective Clothing to Penetration by Synthetic **Blood**
D 5151	Test Method for Detection of Holes in **Medical** Gloves

Performance **Specification** for:

F 1002	Protective Clothing for Use by Workers Exposed to Specific Molten Substances and Related **Thermal** Hazards

Practice for:

F 1154	Qualitatively Evaluating the Comfort, **Fit**, Function, and Integrity of Chemical Protective Suit Ensembles
F 1301	**Labeling** Chemical Protective Clothing
F 1461	Chemical Protective Clothing **Program**
F 1731	Body Measurements and **Sizing** of Fire and Rescue Services Uniforms and Other Thermal Hazard Protective Clothing

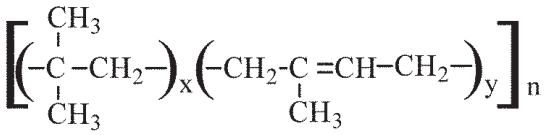
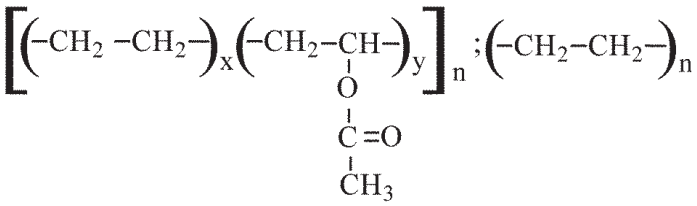
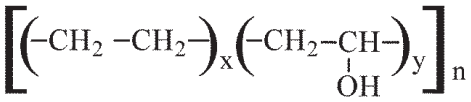
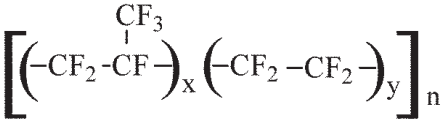
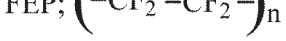
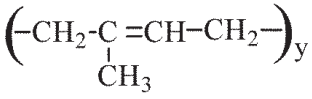
Guide for:

F 1001	Selection of **Chemicals** to Evaluate Protective Clothing Materials
F 1186	**Classification of Chemicals** According to Functional Groups
F 1194	**Documenting** the Results of Chemical Permeation Testing on Materials Used in Protective Clothing
F 1296	**Evaluating** Chemical Protective Clothing
F 1449	Care and Maintenance of **Flame** Resistance and Thermal Protective Clothing

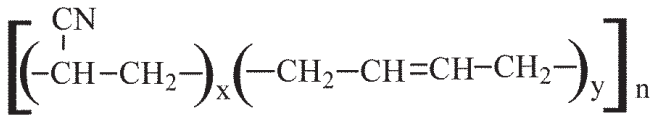
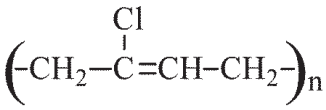
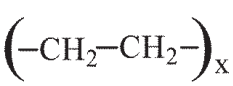
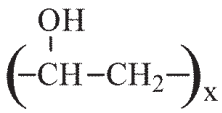
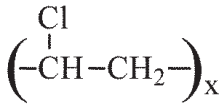
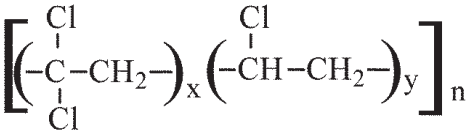
Terminology for:

F 1494–94	Protective Clothing

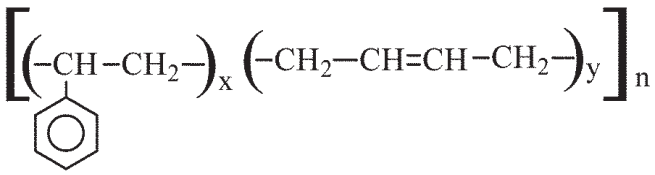
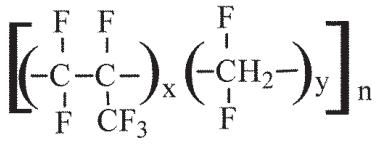
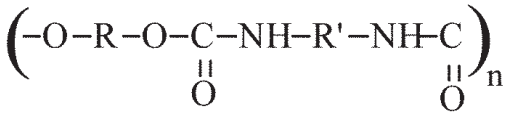
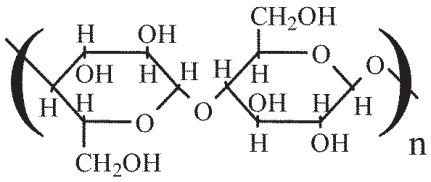
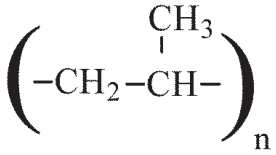
APPENDIX 14-2 COMMON POLYMERIC STRUCTURES USED IN CPC

Name (constituents)	Repeating unit(s)
Elastomers and other plastics	
Butyl (97% isobutylene/3% isoprene copolymer)	
Chlorobutyl (butyl rubber with Cl atoms substituted randomly for H atoms)	see Butyl
Chlorinated polyethylene (polyethylene with 36–45% by weight; Cl atoms substituted randomly for H atoms)	see Polyethylene
EVA/PE (blend of 14% ethylene/vinyl acetate copolymer; 86% polyethylene)	
EVOH (ethylene/vinyl alcohol copolymer)	
Fluorine/Chloroprene (Viton chloroprene laminate)	see Viton and Neoprene
FEP, fluorinated ethylene propylene resin (hexafluoropropylene/tetrafluoroethylene copolymer)	
FEP/TFE (FEP; tetrafluoroethylene blend)	
Natural rubber (isoprene)	

APPENDIX 14-2 COMMON POLYMERIC STRUCTURES USED IN CPC (Cont.)

Name (constituents)	Repeating unit(s)
Elastomers and other plastics	
NBR, Nitrile (random or alternating copolymer of acrylonitrile/butadiene)	
Neoprene (chloroprene)	
Neoprene/SBR (chloroprene; styrene butadiene blend)	see Neoprene; SBR
Neoprene/natural (chloroprene; isoprene blend)	see Neoprene; Natural rubber
Polyethylene (ethylene)	
PVA (vinyl alcohol)	
PVC (vinyl chloride)	
PVC/Nitrile (blend)	see PVC; NBR
Saran (85% vinylidene chloride/15% vinyl chloride copolymer)	
Saranex (laminate of polyethylene (Tyvek and Saran)	see structures elsewhere

APPENDIX 14-2 COMMON POLYMERIC STRUCTURES USED IN CPC (Cont.)

Name (constituents)	Repeating unit(s)
Elastomers and other plastics	
SBR (25% styrene/75% butadiene random copolymer)	
Viton (hexafluoropropylene/ vinylidene fluoride random copolymer)	
Vitrile (Viton; nitrile blend)	see Viton; NBR
Trionic (natural; neoprene; carboxylated nitrile blend)	see Natural; Neoprene; NBR (carboxylated nitrile has carboxyl groups at the end of the polymer chains)
Urethane (condensation product of a polyisocyanate and a polyol)	
Commonly Coated Fabrics	
Cellulose or cotton (polysaccharide, or polyalcohol)	
Disposagard (cellulose reinforced with nylon scrim)	see Cellulose
Duragard (non-woven polypropylene fibers)	
Fiberglass (fibers of glass, usually coated with silicone or silanes)	May be added to many polymers (polyester, polypropylene, nylon)