



Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing¹

This standard is issued under the fixed designation F2757; 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 guide provides recommendations for home laundering of clothing that is flame, thermal, and arc resistant.

1.1.1 This guide does not apply to dry cleaning of flame, thermal, and arc resistant clothing. For more information on dry cleaning, follow label instructions or contact your garment supplier or fabric manufacturer.

1.1.2 This guide does not apply to industrial laundering of flame, thermal, and arc resistant clothing. For more information on industrial laundering, follow Guide [F1449](#) or contact your garment supplier.

1.2 When garments are laundered properly, using the proper detergent, home laundering is an effective cleaning process.

1.3 It is important that potentially flammable contaminants are removed from garments during the wash process. If flammable contaminants are not removed, the flame resistance of the garment may be compromised.

1.3.1 To reduce the potential of employees wearing garments contaminated with flammable substances, the end user should analyze the soil conditions to which a worker may be exposed, along with the effectiveness of the wash procedure. In the event home laundering is deemed ineffective, alternative solutions should be pursued (dry cleaning, industrial laundering, disposable FR coveralls, etc.).

1.4 Certain laundry chemicals that may have an adverse effect on fabric flame resistance are identified in this guide and should not be used.

1.5 This guide does not apply to specialized protective garments such as specialized firefighter turnout gear and proximity firefighter ensembles.

1.6 This guide also provides recommendations for inspection criteria that are significant to the performance of flame, thermal, and arc resistant clothing.

¹ This guide is under the jurisdiction of ASTM Committee [F23](#) on Personal Protective Clothing and Equipment and is the direct responsibility of Subcommittee [F23.80](#) on Flame and Thermal.

Current edition approved April 1, 2016. Published April 2016. Last previous version published 2009 as F2757 – 09. DOI: 10.1520/F2757-09R16.

2. Referenced Documents

2.1 *ASTM Standards*:²

D123 [Terminology Relating to Textiles](#)

[F1449](#) [Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing](#)

F1494 [Terminology Relating to Protective Clothing](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *care and maintenance, n*—effective cleaning to remove soil and maximize useful life of garments while maintaining (not removing) protective properties and procedures for inspection, repair, and removal from service.

3.1.2 *end user, n*—the entity or organization whose employees ultimately wear the flame, thermal, and arc resistant clothing.

3.1.3 *soil, n*—dirt or other foreign substances which become attached to the surface of protective clothing.

3.1.4 *wearer, n*—the individual who wears flame, thermal or arc resistant clothing and is responsible for care and maintenance of the clothing.

3.1.5 *garment, n*—an article of clothing used to cover the body.

3.1.6 *fabric, n*—in textiles, a planar structure consisting of yarns or fibers.

4. Summary of Guide

4.1 This guide provides recommendations to effectively care for and maintain flame, thermal, and arc resistant clothing. The guidelines include:

4.1.1 A listing of elements to consider when laundering at home.

4.1.2 Recommendations for removing flame, thermal, and arc resistant clothing from service.

4.1.3 Recommendations for the repair, modification and fit of flame, thermal and arc resistant clothing.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

5. Significance and Use

5.1 This guide is intended for use by employees of the end user, such as safety personnel or program administrators, who have chosen to implement a home laundered flame, thermal or arc resistant clothing program.

5.2 This guide describes the key components involved in the home care and maintenance of flame, thermal, and arc resistant clothing. The decision to home launder flame, thermal and arc resistant clothing is part of an overall hazard analysis. It should include the nature of the hazard, the soils and any chemicals present in the workplace. Requirements may exist that require work apparel to be cleaned professionally due to the risk of contamination of the home or waste water caused by the wearer's on the job exposure.

5.3 The guide provides the end user assistance to develop laundering methods that will clean the garment and maintain the flame, thermal, and arc resistant characteristics of the clothing during its useful service life. The guide also provides suggestions for increasing the wear life, appearance and function of the clothing.

5.4 The guide also provides suggestions as to when flame, thermal, and arc resistant garments should be removed from service.

6. Procedure

6.1 Garment manufacturers, in consultation with fiber and fabric suppliers, are responsible for providing information on the performance characteristics and maintenance needs of their garments. The end-user is responsible for understanding the hazards present in the workplace and selecting appropriate engineering controls and protective equipment and garments to address those hazards and communicating home laundering instructions to the wearer.

6.1.1 If questions remain about care and maintenance of flame, thermal and arc resistant clothing, contact the garment manufacturer or garment supplier for specific care instructions for the fabrics or garments.

6.2 Below are recommendations to provide optimal care and maintenance of flame, thermal, and arc resistant properties.

6.2.1 Always follow the care label.

6.2.2 Use household laundry detergents. Do not use fatty-based or bar soaps. Liquid detergents are recommended.

6.2.2.1 Review garment care labels or contact garment manufacturers for a list of detergents acceptable for use with their flame, thermal, and arc resistant clothing.

6.2.3 Do not use chlorine bleach, hydrogen peroxide, starch, fabric softeners, or detergents or pretreatment products with chlorine bleach, hydrogen peroxide or derivatives of chlorine bleach or hydrogen peroxide.

NOTE 1—If there are questions about whether a cleaning product contains these chemicals, refer to the product's ingredients or contact the manufacturer.

6.2.4 Loosely add clothing to the washing machine. Do not overload the machine. Follow the washing machine manufacturer's instructions for acceptable wash load sizes.

6.2.5 Select a machine cycle that is appropriate for the soil level and type of clothing being handled and use the hottest water allowed by the clothing care label.

6.2.6 Use soft water or detergent specifically designed for hard water. Hard water (greater than 7 grains per gallon of hardness) can leave residue on fabrics that may mask flame resistance.

6.2.7 Clothing soiled with combustible or flammable chemicals should be handled carefully and in accordance with pre-established procedures established by the end user, as stated in 5.1. In addition, failure to fully remove these chemicals could compromise the flame resistant effectiveness of the garment.

NOTE 2—Garments soiled with hazardous chemicals should only be handled by qualified individuals with techniques approved for such materials.

6.2.8 A proper care label could encompass that protective apparel could be designed not to be laundered, or dry cleaned, or is distinctly of a limited use, or one of disposable nature. Garments of this nature shall not be laundered or reused, in accordance with their label.

6.3 Listed below are recommendations for increasing the wear life, appearance and comfort of the clothing.

6.3.1 It is recommended to launder FR and non-flame resistant garments separately.

NOTE 3—Laundering FR and NFR garments together may result in appearance degradation and/or lint transfer for some FR fabrics, although it is unlikely to result in reduced flame resistance.

6.3.2 Pre-treat stains and heavy soil lines on collars and cuffs. Rub with full-strength, heavy-duty liquid detergent or off-the-shelf pretreatment products following the product's recommendations for use.

6.3.3 Wash in the water temperature recommended by the label.

6.3.4 Turn garments inside out when laundering.

6.3.5 Tumble dry on hottest setting allowed by the clothing care label. Do not over dry. Remove from dryer immediately when dry. Some garment labels indicate better drying performance when using the permanent-press or easy-care sensor-dry settings, instead of a time-to-dry setting because sensor-dry settings will avoid over-drying. Line drying is also acceptable.

6.3.6 If desired, steam or dry iron with heat settings according to the care label instructions.

6.3.7 Use regular detergent with top-loading washers and high efficiency detergents with front-loading washers.

6.4 Removal from Service— For most practical purposes, garments may be temporarily or permanently removed from service for reasons as determined by inspection based on subjective evaluation. Ultimately, determination of when flame, thermal and arc resistant clothing should be removed from service is the responsibility of the end user.

6.4.1 The following items, identifiable by visual examination, may diminish the effectiveness of the flame, thermal, and arc resistant clothing. Other issues may also have such effects.

6.4.1.1 *Worn Out*—Thin spots, holes, excessive wear or abrasion – for example on elbow or knee area.

6.4.1.2 *Mechanical Damage*—Evidence of cuts, rips, tears, open seams, and nonfunctional closures.

6.4.1.3 *Modifications*—Alteration(s) to a garment that differs significantly from the original design.

6.4.1.4 *Fit*—The flame, thermal, and arc resistant clothing no longer fits the wearer.

6.4.1.5 *Flammable Substances*—Garments soiled by substances that represent a flammability risk, such as solvents, solids, oils, and other petroleum products that cannot be properly removed by cleaning.

NOTE 4—The presence of a petroleum or chemical odor can be evidence of a flammable substance.

6.4.2 If garments are removed from service for a year or longer, contact the garment manufacturer for storage and usage instructions.

6.5 *Repairs*—Repairs of flame, thermal and arc resistant clothing should be made using fabrics and components that are equivalent to those used in the original manufacturing to avoid reducing the performance properties of the flame resistant

garment. Properly repaired garments may be returned to service in a FR clothing program.

NOTE 5—Hemming pants or attaching patches may be performed using non-FR thread for convenience.

6.6 *Modifications*—Modifications to flame, thermal, and arc resistant clothing shall be modified using fabrics and components that are equivalent to those used in manufacturing. Modified garments that differ significantly from original design or function should not be worn.

NOTE 6—Modifications, such as making long sleeve shirts into short sleeve shirts or cutting hoods off sweatshirts, can have a significant impact on the protective characteristics of the garment. Wearers should verify that modified garments continue to meet the end user's protective requirements.

6.7 *Permanent removal from service*—Garments that have un-repairable damage, are worn out, or are unusable for other safety reasons, are not to be reused.

6.7.1 Garments removed from service should be marked or rendered so that they will not be accidentally reused.

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