



Designation: C930 – 12

Standard Classification of Potential Health and Safety Concerns Associated With Thermal Insulation Materials and Accessories¹

This standard is issued under the fixed designation C930; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This classification identifies potential concerns and effects that could result from direct contact with thermal insulation materials and accessories, or be caused by indirect action of events such as aging, fire, or physical disturbance.

1.2 Intent of Classification:

1.2.1 It is the intent of this classification to alert others to potential concerns, effects, hazards, or risk.

1.2.2 It is not the intent of this classification to establish the degree of risk or hazard or limiting values of potential hazards.

1.2.3 It is not the intent of this classification to establish or recommend methods or markings to reduce or mitigate the potential; however, it is recognized that correct procedures and precautionary measures can substantially reduce or eliminate some of the potential concerns, effects, hazards, or risks.

NOTE 1—See [Appendix X1](#) for commentary.

1.3 This classification recognizes the responsibility of producers and users, as appropriate, to: (1) provide information on known effects or hazards, (2) advise on established safety and health practices, and (3) determine applicable regulatory requirements.

1.4 This classification does not address the health and safety concerns of thermal insulation materials and accessories during manufacture.

1.5 Omission of an item from this classification does not imply an absence of potential concerns or effects.

1.6 There is no importance in the order of listing.

¹ This classification is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.40 on Insulation Systems.

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2. Referenced Documents

2.1 ASTM Standards²

C1055 Guide for Heated System Surface Conditions that Produce Contact Burn Injuries

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *degree of risk*—the probability or expected frequency of the event, multiplied by the expected magnitude of exposure and the potential for harm.

3.1.2 *direct contact*—the straightforward touching resulting from use, manipulation, placement, etc.

3.1.3 *hazard*—a condition or set of circumstances that presents a specific injury or adverse health potential.

3.1.4 *indirect action or events*—the actions or events that are not directly created by, or straightforwardly caused by, the person(s) potentially exposed to the effects or hazards.

3.1.5 *potential*—the possible as opposed to the actual; that which may, but has not yet, come into being; that which is latent, unrealized.

3.1.6 *risk*—the exposure to chance of injury or illness or loss.

4. Significance and Use

4.1 The purpose of this classification is to identify potential concerns and effects which may occur during the life cycle (installation, service, removal, and disposal) of insulation materials and accessories resulting from direct contact or indirect action or events.

4.2 This classification does not identify remedial or preventive steps that may be taken to correct potential problems or

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.

hazards; rather it is intended as a checklist that will make it easier to deal constructively with these potentials, and to determine what, if any, specific requirements need to be added to other standards concerning insulation materials or accessories. (See [Appendix X2](#) for sources of information.)

4.3 This classification recognizes that proper handling and installation procedures can substantially reduce the potential concerns and effects. Further, it recognizes that in some situations the presence or creation of potential effects or hazards results from an intervening act of human or natural origin, or depends on access to or contact with the materials or accessories. Lack of compatibility of the individual components of an insulation system with each other or the environmental conditions within which the system will operate, or both, may create unanticipated effects. (See [Appendix X3](#).)

5. Basis of Classification

5.1 Classification is based on several broad groupings of potential concerns that could result from direct contact with thermal insulation materials and accessories, or be caused by indirect actions or events.

5.2 Potentials that occur from direct contact or indirect action or events are described as follows:

5.2.1 *Potential Health Effects*—Those effects that create risk of temporary or permanent changes in normal body functions and biochemical activity. The latter may involve vapors (such as organic solvent fumes), corrosive liquids (acids, alkalis, and organics), and solids (usually high surface area particulates) that react with body tissues or fluids.

5.2.1.1 A Material Safety Data Sheet (MSDS) is required by the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor (29CFR 1910.1200) for hazardous chemicals produced in the United States, or imported. (The MSDS for any product or material is issued and available from the organization producing the product or material.)

5.2.1.2 The MSDS for any insulation product, system, or accessory (including adhesives) should be obtained and reviewed to determine any potential effect on humans using or installing the material.

5.2.1.3 When *tests* are included in a standard, the MSDS for chemicals required should be reviewed to ensure that proper guidance for safe handling and use is incorporated.

5.2.2 *Potential Traumatic Injury Effects* ([Table 1](#))—These effects may result from sharp or rough materials or accessories which have protrusions or abrasive surfaces, cause overheating, or transmit electrical energy, and generally require direct contact with the material or accessory causing lacerations, abrasions, punctures, etc.

5.2.3 *Potential Effects Resulting from Combustion* ([Table 2](#))— Those effects that result principally from the emission of heat, gases (toxic and non-toxic), fibers, particulates, and depletion of oxygen which takes place during combustion that exposes or involves insulation materials or accessories.

5.2.4 *Potential Effects from Structural Conditions* ([Table 3](#))—Those effects that result principally from the overloading or deterioration of structural members of a building resulting in failure of the structure, or a portion of it, and its collapse on occupants.

TABLE 1 Potential Traumatic Injury

Insulation Product, System, or Accessory	Potential Exposure	Potential Effect on Humans
Cellular glass Encapsulated or reflective insulation Insulation materials and accessories	abrasive surface	Contact may abrade skin
	high surface temperature	Contact may cause thermal burns.
	application of thermal insulation around or adjacent to electrical wiring or fixtures (particularly important if the covering on the electrical circuit is old) may produce: ^A	
Man-made vitreous fibers: Glass Mineral wool Refractory Metal encapsulated or reflective insulation	(a) overheating that could result in deterioration of the wire covering and contact with electrical energy	Electrical shock
	(b) if subject to moisture accumulation could result in deterioration of the wire covering and contact with electrical energy	Electrical shock
	(c) overheating that could result in fire	Thermal burns
Metal foil	fiber stalks or bundles	Contact may abrade or puncture skin.
	electrically conductive	Contact may transmit electrical energy if touching an electrical circuit resulting in minor or serious electrical shock.
Sheet metal lagging, bands, fasteners, sheet metal	electrically conductive	Contact may transmit electrical energy if touching an electrical circuit resulting in minor or serious electrical shock.
	sharp or pointed edges	Contact may cause skin cuts, tears or punctures.

^AAlso see [Table 3](#).

TABLE 2 Potential Effects Resulting from Combustion

Insulation Product, System, or Accessory	Potential Exposure	Potential Effect on Humans
Adhesives, coatings, and mastics containing solvents	combustion of flammable or combustible solvents, during application or from residual solvents	Thermal burns and other effects from flame, flashover or explosion. Impaired vision from smoke. Toxic effects ^A
Organic polymeric foams	combustion of organic materials	Thermal burns. Impaired vision from smoke. Toxic effects ^A
Organic fibers: Animal hair Cellulosic Vegetable PVC jacketing	combustion of organic materials	Thermal burns. Impaired vision from smoke. Toxic effects ^A
Urea formaldehyde foam	combustion of organic materials	Thermal burns. Impaired vision from smoke. Toxic effects ^A
Vapor retarders-including asphalt-coated	combustion of organic materials	Thermal burns. Impaired vision from smoke. Toxic effects ^A
Insulations (principally fibrous) organically bound or impregnated	combustion of organic materials	Thermal burns. Impaired vision from smoke. Toxic effects ^A

^AToxicity of smoke and fumes depends on materials burning and intensity.

TABLE 3 Potential Effects Resulting from Structural Conditions

Insulation Product, System, or Accessory	Potential Exposure	Potential Effect on Humans
Insulation materials and accessories	contact with metal structural components may result in oxidation of the metal additional weight load to structure plus snow or ice.	Long term structural weakening or failure and collapse on occupants. Structural failure and collapse on occupants if design characteristics are not reevaluated prior to installation.

5.2.5 *Guidance on Burn Injuries.* Guide C1055 provides guidance on burn injuries associated with heated system surface contacts.

6. Keywords

6.1 hazards; health effects; injurysafety

APPENDICES

(Nonmandatory Information)

X1. COMMENTARY

X1.1 *Background of Standard*—The original concept was to develop two standards that alert task groups writing standards to safety and health concerns associated with thermal insulation materials and accessories *during* installation and *after* installation. Classification C930 – 80 resulted from a number of drafts and concerned the effects *during* installation.

X1.1.1 Subsequently attention was given to the effects *after* installation and a proposed classification standard proceeded through a number of drafts, with several new approaches to the classification and information presented. Finally it was agreed there was sufficient similarity between the existing standard (Classification C930 – 80) and the proposed, so that they should be combined into one standard (Oct. 1982 Subcommittee meeting).

X1.1.2 This revision combines the concerns and effects associated with thermal insulation materials and accessories during installation, and (after) when remodeling, or retrofitting, or as a result of indirect action or events.

X1.1.3 This is a resource document intended solely to alert standards writers and users of insulating materials and accessories to *potentials*. It is most emphatically *not* an evaluation of comparative risks, nor is it a predictor of inevitable problems. No effort has been made to address the numerous preventive or remedial measures available to manufacturers and users, even though it is recognized that many of these are routinely used. The user in a corporate sense has a responsibility to advise the installer (tradesman), as an employee, of the information supplied by the manufacturer.

X1.1.4 During deliberations on the revision of C930 – 80, many requests to add qualifying or explanatory phrases and footnotes that indicate increased or decreased potential risk with specific products were received. It became clear that this qualifying or explanatory information would move the classification into territory beyond its own scope by noting palliative measures and assigning degrees of risk to some products and