Designation: C930 – 18

Standard Classification of Potential Health and Safety Concerns Associated With Thermal Insulation Materials and Accessories[1]

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 reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. 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.

1.7 *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. Referenced Documents

2.1 *ASTM Standards*[2]

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.

3.1.6.1 *Discussion*—Risk is a combination of hazard and the probability of harm.

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 hazards; rather it is intended as a checklist that will make it

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[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.

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, alkalies, and organics), and solids (usually high surface area particulates) that react with body tissues or fluids.

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

5.2.1.2 The SDS 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 SDS 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*—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. The exposure effects can result from the actual combustion process or from the effluents that originate as a consequence of the combustion. Combustion can cause thermal effects (burns or scalds), toxic effects (resulting from the inhalation of asphyxiant or irritant combustion products, typically contained in the vapor phase),

TABLE 1 Potential Traumatic Injury

Insulation Product, System, or Accessory	Potential Exposure	Potential Effect on Humans
Cellular glass	abrasive surface	Contact may abrade skin
Encapsulated or reflective insulation	high surface temperature	Contact may cause thermal burns.
Insulation materials and accessories	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]	
	(*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
Man-made vitreous fibers: Glass Mineral wool Refractory	fiber stalks or bundles	Contact may abrade or puncture skin.
Metal encapsulated or reflective insulation	electrically conductive	Contact may transmit electrical energy if touching an electrical circuit resulting in minor or serious electrical shock.
Metal foil	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	sharp or pointed edges	Contact may cause skin cuts, tears or punctures.

[A] Also see Table 2.

dermal effects (such as skin irritation) and impaired vision due to smoke obscuration, which can impair egress or rescue, or both, in case of fire. The effects resulting from combustion (or fire) are a function of the material (or materials) involved in the fire, the fire scenario and the amount of material that has burnt. Any combustible insulation material has the potential to be involved in fires. ASTM Committees E05 (on Fire Standards), E34 (on Occupational Health and Safety) and F23 (on Protective Clothing), as well as NFPA (National Fire Protection Association), SFPE (Society of Fire Protection Engineers) are potential resources to better understand the effects of combustion or fire.

5.2.4 *Potential Effects from Structural Conditions (*Table 2*)*—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.

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; injury; safety