

CSA Standard Z94.1-05 Industrial Protective Headwear - Performance, Selection Care and Use

Scope and Application:

This standard applies to protective headwear selection, care and use for industrial, construction, mining, utility and forestry sectors. It defines areas of the head to be protected, performance requirements for dielectric strength, impact attenuation, penetration resistance, stability, flammability and ignition. It does not apply to comfort, service life, appearance, bump caps, firefighter helmets, rescue helmets, crash helmets, sports helmets recreation helmets or riot control helmets.

Definitions:

- **Dielectric strength** - the ability of a material or a configuration of material to resist the passage of electric current.
- **Suspension**- part of headwear product that holds headwear in place during normal use.

Headwear Classification:

- Type 1 for impact and penetration to the crown only
- Type 2 for impact and penetration to the crown and laterally.

Each of the two types (1 and 2) has three separate classes, E, G and C. The three separate classes identify electrical ratings:

- Class E has 20,000 V electric current rating
- Class G has a 2,200 V electric current rating
- Class C has NO electrical current rating for each of the two types.

Headwear Selection is based on a hazard assessment conducted for the work situation and suitability with other equipment (e.g. hearing protection devices). The hazard assessment is based on observations, discussions with users, procedural reviews, and accident record reviews related to the equipment and procedure. The assessment shall be carried out by a qualified person and reviewed periodically. Where a hazard assessment is not carried out, a Type 2 Class E shall be selected because it has the highest level of dielectric (20,000V), crown (55 j) and lateral (30 j) protection.

- Type 1- crown only headwear - where it can be shown that there is no hazard related to lateral impact, reversible headwear should be selected if procedure requires wearing the headwear backwards (i.e. welding). Where high visibility headwear is required refer to CAN/CSA –Z96 for color and retro-reflective tape requirements.
- Type 2 - crown and lateral headwear - is for potential crown and lateral impact, where moving objects are present (medium to large manufacturing operations), construction and demolition sites, when the hazard assessment cannot determine the type.

Fitting chart matches head circumference to hat size. The air gap between the top of the head and the crown of the headwear is a shock absorption system for protection against impact. The suspension and nape strap shall be adjusted so headwear is *not worn* with peak pointing upward, with a baseball cap underneath or with nape strap at the front, in the case of reversed headwear. Diagram shows how headwear is to be worn. Accessories include non-metallic stickers 1/2 inch above the brim, bandanas, hair nets, welder's caps, and winter liners. Baseball caps interfere with the suspension system.

Inspect headwear *daily* for cracks, dents, cuts, gouges, signs of wear, exposure to heat or sun noted by appearance or color or finish (dullness, matte, chalk, and craze pattern). Headwear struck by an object should be replaced even with no noted signs of damage. Use of hair products, hair oils and perspiration, insecticides can affect suspension components. Inspect suspension system straps and clips for fraying, tears and cracks. If a Type 2 helmet has a damaged foam lining, replace the whole helmet.

(Over)

(cont'd)

Maintenance of headwear involves cleaning with mild soap (no solvent, abrasive or petroleum based products) and air dried without applying heat. Items should not be stored in between suspension and shell; components shall not be replaced with another manufacturer's component; components shall not be painted; no holes shall be made in the shell; nor shall it be decorated or stored in the rear window deck of a car where it is exposed to sunlight.

Design, Constructions and Requirements are outlined for materials to be resistant to exposure to environmental agents (perspiration, toiletries, cleaning agents, solar ultraviolet rays, extreme temperatures and rain), flame, ignition and to be known not to cause skin irritation. Components shall be designed so they cannot be assembled incorrectly or if assembled incorrectly they do not adversely affect its functions. Sampling, head form, environment, test line, sample conditioning (temperature, water immersion, solvent treatment, and aging) requirements are defined. The dielectric strength and impact attenuation testing requirements for sample preparation, apparatus set up, test methods, test voltages. The sample is dropped in guided free form, assembled on the head form.

Markings on the product include manufacturer's identity, model designation, "type", class, reverse orientation performance if applicable, year, month of manufacture, size range or size, explicit warning statement related to replacement after impact, no painting, no solvent, decals only if they are known *not to* affect adversely material characteristics and that modifications may reduce protective properties.

User Information shall include application, expected useful life, storage life, cleaning instructions, cautionary note on inappropriate modifications, limitations, capabilities, and adjustment instructions.

This bulletin contains a summary of excerpts taken from the Standard, for general information purposes only. This bulletin is not reflective of the complete requirements that the Standard prescribes.

Note: *Manitoba Regulation M.R. 217/2006 Section 1.4 inconsistency:*

If there is an inconsistency between this regulation and a requirement contained in a publication, code or standard referenced in this regulation, the provisions in this regulation prevail.