

Head Protection Systems



1. Scope

This standard covers the requirements for head protection systems, more commonly known as hard hats and hard hat accessories. This standard applies to the Seattle City Light (SCL) stock numbers cited in Section 12.

The requirements for arc flash protection and face shields are outside the scope of this standard. See SCL 4013.31 for arc flash protection accessories.

2. Application

A head protection system is a hard hat shell and an internal suspension manufactured by the same company and designed to work together. A head protection system:

- Reduces the force of an impact.
- Guards against penetration.
- May provide protection from electric shock.

The hard hat shell comes in a partial brim "cap" or a full brim style. The suspension uses either a dihedral (pinlock) or ratcheting adjustment system to ensure proper fit.

Standard Coordinator
Laura Vanderpool

A handwritten signature in black ink, appearing to read 'Laura Vanderpool'.

Standards Engineering Supervisor
Brett Hanson

A handwritten signature in black ink, appearing to read 'Brett Hanson'.

Division Director
Bob Risch

A handwritten signature in black ink, appearing to read 'Bob Risch'.

Hard hat accessories include:

- Replacement suspensions
- Brow pads
- Chin straps
- Winter liners

Hard hat shells shall only be used with suspensions that are manufactured by the same company.

3. Industry Standards

Head protection systems shall meet the requirements of the following industry standard:

ANSI/ISEA Z89.1-2014; American National Standard for Industrial Head Protection

Color designations shall be consistent with the **Pantone Matching System (PMS)**; the standardized color reproduction numbering system of the Pantone Corporation.

4. Requirements

Head protection systems shall meet the standard Type I, Class E performance requirements as defined in ANSI/ISEA Z89.1.

Testing requirements are covered in Section 9.

5. Materials

Hard hat shells shall be fabricated from water resistant, fire resistant, acid resistant, non-conducting, High-Density Polyethylene (HDPE) plastic #2.

Suspensions shall be of the fixed crown type with adjustable woven nylon straps and adjustable built-in nape strap.

Suspensions shall provide a suitable fit to the head and the hard hat shall be free from bounce.

6. Shell Color

Hard hat shells shall be furnished in the following colors:

- Yellow (PMS 109C)
- White (PMS white)

7. Logo Color

The SCL logo shall be in accordance with the Seattle City Light Branding Guidelines. The two-line Chief Seattle logo shall be printed on the front of each hat in the following colors:

- **White hats:** Two-color application process using SCL Blue (PMS 293) and Black, as depicted in Figure 7a.
- **Yellow hats:** Three-color application process using SCL Blue (PMS 293) and Black, with the background of the medallion printed in White, as depicted in Figure 7b.

Dimensions of logo shall be as shown in Figure 7c.

Figure 7a. Chief Seattle Logo Color Scheme on White Hats



Figure 7b. Chief Seattle Logo Color Scheme on Yellow Hats



Figure 7c. Chief Seattle Logo Dimensions



8. Marking

Head protection systems shall be marked according to the requirements of ANSI/ISEA Z89.1 and shall include:

- Name or identification mark of the manufacturer
- Date of manufacture
- ANSI/ISEA Z89.1 designation
- Applicable Type and Class designations followed by applicable optional criteria markings
- Appropriate head size range

9. Testing

Tables 9a and 9b summarize the testing requirements of ANSI/ISEA Z89.1.

Table 9a. Preconditioning for Force and Penetration Testing

Preconditioning	Duration, minimum (hours)	Requirements
120°F ± 3.6°F	2	Tested within 30 seconds of preconditioning
0°F ± 3.6°F	2	Tested within 30 seconds of preconditioning
Submersion in fresh tap water maintained at 73.4°F ± 5.4°F	2	Tested following a maximum drain time of 30 seconds and within 90 seconds of preconditioning

Table 9b. Test Performance Requirements

Test Name	Description	Requirements	ANSI Z89.1 Section No.
Flammability	Application of a calibrated horizontal test flame from a Bunsen burner with a 0.4-in bore for 5 seconds +1, -0.	No flame shall be visible 5 seconds after removal of test flame.	10.1 7.1.1
Force Transmission	An approved impactor of 8 lb ± 0.1 lb shall be dropped from a height that yields an impactor velocity of 18 ft/s ± 0.16 ft/s.	Shall not transmit a force greater than 1000 lbf. For each preconditioning, the maximum transmitted force of individual test samples shall be averaged. The averaged values shall not exceed 850 lbf.	10.2 7.1.2
Apex Penetration	An approved penetrator shall be dropped from a height that yields an impact velocity of 23 ft/s ± 0.3 ft/s	An approved penetrator shall not make contact with the top of the test headform.	10.3 7.1.3
Electrical Insulation Current Leakage	With the helmet filled and submerged in fresh tap water, a voltage shall be applied and increased to 20,000 Vac (rms) and held for not less than three minutes at which time the current leakage shall be recorded.	Leakage current shall not exceed 9 mA.	10.7.4.2 7.1.4.3
Electrical Insulation Burn-through	After the current leakage test, the test sample shall be tested for burn-through by further increasing the voltage to 30,000 Vac (rms) at a rate of 1000 volts per second and then immediately reducing the voltage to 0.	The test sample shall not burn through.	10.7.4.2 7.1.4.3

10. Packaging

Head protection systems and accessories shall be packaged to prevent damage during shipping, handling, and inside storage.

Shipping containers shall be legibly marked with the SCL purchase order number.

11. Issuance

EA

12. Approved Manufacturers

Stock No.	Description	E. D. Bullard	Honeywell North	Protective Industrial Products	Occunomix	Safety Flag Co.
110022	Hard hat, full brim, yellow	33YLR3000	–	–	–	–
110112	Hard hat, full brim, white	33WHR2000	–	–	–	–
110020	Hard hat, partial brim cap style, yellow	BYB62711	–	–	–	–
110021	Hard hat, partial brim cap style, white	BYB62709	–	–	–	–
110182	Suspension, pinlock For Bullard hard hat stock numbers 110020, 110021, 110022, and 110112	RS6PC	–	–	–	–
110183	Suspension, ratcheting For Bullard hard hat stock numbers 110020, 110021, 110022, and 110112	RS6RC	–	–	–	–
110180	Chin strap, elastic For Bullard hard hat stock numbers 110020, 110021, 110022, and 110112	ES42	–	–	–	–
110190	Brow pad, Polartec For Bullard hard hat stock numbers 110020, 110021, 110022, and 110112	RBP-Cool	–	–	–	–
110136	Winter liner, dielectric	–	WL4	363-1RL2B	RQ300	–
110137	Winter liner, dielectric neck and face shield	–	–	364-ML2FMP	LM660	–
012590	Reflective vinyl hard hat adhesive strips, white 1 in x 4 in	–	–	–	–	6801W

13. References

SCL Brand Guidelines; February 2015

SCL Material Standard 4013.31; “Arc Flash Protection Accessories”

14. Sources

Colloff, Hilary; SCL Marketing Development Coordinator and branding subject matter expert for 4006.30

E. D. Bullard Company; www.bullard.com

https://explore.honeywell.com/NA_Safety_Solutions.html

Kephart, Bob; SCL Associate Electrical Engineer and originator of 4006.30

www.safetyflag.com

WAC 296-800-160; Personal Protective Equipment (PPE), Core Rules; State of Washington Administrative Code; 2015

www.bullard.com

www.occunomix.com

www.pipglobal.com