
Cold Storage Warehouse Worker Thermal PPE Guidelines

1.0 Objective & Intent

This SOP establishes mandatory thermal personal protective equipment (PPE) and safe work procedures for all personnel entering or working in cold storage warehouse environments where ambient temperatures are maintained at or below -18°C (0°F). The primary objective is to prevent cold stress injuries including hypothermia, frostbite, trench foot, and chilblains, and to ensure full compliance with WorkSafeBC OHS Regulation Part 8 (Personal Protective Clothing and Equipment) and Part 9 (Cold Exposure). This procedure mitigates the specific risk of prolonged cold exposure leading to reduced manual dexterity, impaired cognitive function, and increased likelihood of slips, trips, and falls in icy conditions.

2.0 Operational Scope

This procedure applies to all warehouse workers, order pickers, forklift operators, maintenance personnel, supervisors, and any other employees or contractors who are required to enter, work in, or transit through cold storage areas (freezers, blast freezers, and cold rooms) maintained at temperatures below -18°C. It covers all cold storage zones within the facility, including loading docks with freezer access, and applies during all shifts, including regular operations, maintenance shutdowns, and emergency response. Personnel working in cooler environments (0°C to 4°C) must follow a reduced PPE protocol as defined in the facility's Cold Exposure Management Plan.

3.0 Hazard Identification & Mandatory PPE

- Cold Stress: Prolonged exposure to sub-zero temperatures causing hypothermia, frostbite, and reduced core body temperature.
- Frostbite: Freezing of skin and underlying tissues, most commonly affecting fingers, toes, ears, nose, and cheeks.
- Slips, Trips, and Falls: Ice accumulation on floors, frost on surfaces, and reduced dexterity due to cold.
- Impaired Manual Dexterity: Cold hands reduce grip strength and fine motor control, increasing risk of dropped loads and equipment mishandling.
- Reduced Visibility: Frost on safety glasses or face shields can obscure vision.
- Entanglement Hazards: Loose-fitting thermal clothing can become caught in conveyor systems or moving machinery.
- CSA-Approved Insulated Steel Toed Boots rated to -40°C with slip-resistant soles and removable thermal liners.
- Thermal Insulated Coveralls or Multi-Layer Clothing System: Base layer (moisture-wicking), mid layer (fleece or wool), outer layer (windproof, waterproof, insulated coveralls).
- Insulated Gloves rated for sub-zero temperatures (minimum -20°C) with waterproof outer shell; must allow sufficient dexterity for task.
- Thermal Balaclava or Face Mask covering ears, nose, and cheeks, with breathable fabric to prevent moisture buildup.
- Insulated Hard Hat Liner or Thermal Beanie worn under hard hat (must not compromise hard hat fit or suspension).
- CSA-Approved Safety Glasses or Goggles with anti-fog coating; goggles required if ambient temperature is below -25°C or if wind chill is a factor.
- High-Visibility Vest or Jacket with reflective striping worn over thermal coveralls for visibility in dim freezer lighting.

4.0 Required Safety Equipment & Tools

- Personal Cold Exposure Monitor (e.g., wrist-worn temperature sensor or core body temperature patch) for workers with extended shifts in freezers.
- Emergency Thermal Blanket or Heated Recovery Station located immediately outside cold storage entrance.
- Portable Hand and Foot Warmers (chemical or rechargeable) for workers performing stationary tasks.
- Ice Scraper and De-Icing Tool for clearing frost from safety glasses, goggles, and face shields.
- Two-Way Radio or Communication Device capable of operating in sub-zero temperatures (non-touchscreen, physical button preferred).
- Thermometer or Temperature Data Logger to verify ambient temperature in cold storage zone before entry.
- First Aid Kit with cold injury supplies (sterile dressings, rewarming packs, thermal blanket).
- Buddy System Check-In Log or digital check-in system via SafeDesk to track entry/exit times and worker status.

5.0 Step-by-Step Safety Procedure

1. **Pre-Entry Self-Assessment:** Before entering the cold storage area, assess your physical condition. Do not enter if you are fatigued, dehydrated, under the influence of alcohol or drugs, or have a medical condition (e.g., Raynaud's disease, cardiovascular issues) that may be aggravated by cold exposure. Notify your supervisor immediately if you are unfit for duty.
2. **Don Full Thermal PPE:** Put on all mandatory thermal PPE as listed in Section 3.0. Ensure base layer is moisture-wicking (no cotton), mid layer is insulating (fleece or wool), and outer layer is windproof and waterproof. Adjust balaclava and face mask to cover all exposed skin. Verify that insulated gloves fit properly and allow adequate grip for your task. Ensure hard hat liner does not obstruct hearing or vision.
3. **Verify Buddy System and Communication:** Confirm your assigned buddy or team member is present and aware of your entry. Check that your two-way radio is functional and set to the designated channel. Inform the supervisor or control room of your entry time, expected duration, and task location. If working alone (only permitted in exceptional circumstances with supervisor approval), activate the lone worker monitoring system.
4. **Check Cold Storage Temperature and Conditions:** Use the installed thermometer or data logger to verify the ambient temperature inside the cold storage zone. If the temperature is below -30°C or if wind chill from fans or open dock doors creates an effective temperature below -35°C , implement additional precautions including reduced exposure time limits (maximum 30 minutes) and mandatory rewarming breaks every 20 minutes.
5. **Enter Cold Storage and Begin Task with Continuous Monitoring:** Enter the cold storage area and proceed to your assigned work location. Maintain continuous awareness of your physical condition and that of your buddy. Watch for early signs of cold stress: shivering, numbness, tingling in extremities, confusion, or loss of dexterity. If any symptoms appear, stop work immediately and exit to the recovery station.
6. **Adhere to Maximum Exposure Time Limits:** Do not exceed the maximum continuous exposure time as defined by the facility's Cold Exposure Management Plan (typically 60 minutes at -18°C , 45 minutes at -25°C , 30 minutes at -30°C). Set a timer or use the SafeDesk check-in system to alert you when your time limit is approaching. Exit the cold storage zone before the time limit expires.
7. **Perform Rewarming Break in Designated Recovery Area:** Upon exiting the cold storage zone, proceed immediately to the designated rewarming station. Remove outer wet or frost-covered layers. Use the heated recovery station or thermal blanket to gradually rewarm core body temperature. Drink warm (not hot) non-caffeinated, non-alcoholic beverages. Do not use direct heat (e.g., heating pads, hot water) on frostbitten skin. Minimum break duration: 15 minutes or until shivering stops and normal sensation returns.
8. **Inspect PPE and Equipment After Each Exit:** After each cold storage exit, inspect all thermal PPE for frost buildup, moisture, or damage. Dry wet liners and gloves thoroughly before next use. Replace any damaged or compromised PPE immediately. Clean anti-fog coatings on safety glasses or goggles. Report any PPE failures to your supervisor and document in the SafeDesk maintenance log.
9. **Document Exposure and Report Incidents:** At the end of your shift, log your cold storage entry and exit times, total exposure duration, and any symptoms or incidents in the SafeDesk digital log. If any cold stress symptoms were observed (even if mild), complete a near-miss report. If a cold injury (frostbite, hypothermia) is suspected, seek immediate medical attention and notify your supervisor. Do not return to cold storage until cleared by a medical professional.
10. **Emergency Response for Cold Injury:** If a worker exhibits signs of severe hypothermia (uncontrollable shivering,

confusion, loss of consciousness, blue/pale skin) or frostbite (white, waxy, numb skin), call 911 immediately. Move the worker to a warm area, remove wet clothing, wrap in thermal blankets, and do not attempt to rewarm extremities if there is a risk of refreezing. Do not rub frostbitten skin. Provide warm beverages only if the worker is conscious and able to swallow. Await emergency medical services.

Regulatory Disclaimer: This document is a generic safety template provided for educational and informational purposes only. It does not constitute professional engineering, legal, or regulatory compliance advice. The end-user assumes all liability for validating all safety protocols against specific machinery manufacturer manuals and local occupational health and safety regulations (e.g., WorkSafeBC, CSA standards) before deployment.