

X-XX: Technical rescue Protective Ensembles

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Background

When performing the various technical rescues, firefighters need to be protected. Although some PPE can be interchangeable between the various technical disciplines, not one set of PPE can be used for all for example: some technical disciplines require thermal protection, while other disciplines need protection from, cuts at the same time ensuring a grip and flying debris and eye protection. Employers and workers need to work together to ensure the right PPE in the circumstances is obtained and used for the employees' protection.

Concerns/hazards

Firefighters are exposed to hazards during the course of their work and require appropriate personal protective equipment (PPE).

Actions for employers

Employers should:

- Provide appropriate PPE based on hazard assessments
- Ensure PPE complies with applicable standards
- Develop **standard operating guidelines (SOGs)** for technical rescue PPE use
- Ensure proper training, maintenance programs, and supervision

- consult with their joint health and safety committees or health and safety representatives on alternative protection and guidelines for use
- ensure that PPE is appropriately sized to provide effective protection

CONSIDERATIONS

1. Technical rescue protective ensemble is a specialized system of personal protective equipment (PPE) including garments, helmets, gloves, and footwear—designed to protect emergency responders during complex technical rescue incident

This guidance applies to firefighters performing or supporting technical rescue operations, including but not limited to:

- Rope rescue (high/low angle)
- Confined space rescue
- Trench rescue
- Structural collapse / heavy rescue
- Water and ice rescue
- Machinery and elevator
- Vehicle extrication with technical components

2. Hazard-Based PPE Selection

PPE shall be selected based on a **hazard assessment** conducted prior to and throughout the operation. Consider:

- Environmental conditions (heat, cold, water, contaminants, noise)
- Fall, entrapment, or engulfment risks
- Atmospheric hazards (toxic, IDLH, oxygen deficiency)
- Sharp edges, abrasion, and impact hazards

3. Layered Protection Approach

No single PPE ensemble is adequate for all technical rescue scenarios. Fire departments should adopt a **layered approach**, ensuring compatibility between:

- Technical rescue-specific PPE
- Specialized equipment (e.g., harnesses, flotation, helmets)

4. Minimum PPE Requirements by Discipline

4.1 Rope Rescue

- Technical rescue helmet (non-conductive, chin strap secured)
- Class III harness (NFPA-compliant where applicable)
- Gloves appropriate for rope handling
- Footwear with adequate grip and ankle support
- Eye protection as required

Considerations: Avoid structural helmets where snagging hazards exist

4.2 Confined Space Rescue

- Atmospheric monitoring equipment (worn or attended)
- Respiratory protection (SCBA or supplied air, as required)
- Chemical-resistant clothing where applicable
- Intrinsically safe equipment

4.3 Trench Rescue

- Approved helmet with chinstrap
- High-visibility apparel (where traffic exposure exists)
- Protective footwear (puncture-resistant)
- Respiratory protection if atmospheric hazards are present

Note: PPE does not replace engineered protective systems (e.g., shoring).

4.4 Structural Collapse / Heavy Rescue

- Structural firefighting PPE (when fire exposure risk exists)
- Technical rescue helmet (where impact hazards predominate)
- Cut-resistant gloves
- Eye and hearing protection

Consideration: Transition between PPE types may be required as conditions change.

4.5 Water / Ice Rescue

- Personal flotation device (PFD) or ice rescue suit or a combination of both
- Thermal protection (drysuit/wetsuit)
- Helmet designed for water rescue

- Throw bag and tether systems where appropriate

5. Compatibility and Integration

Fire departments should ensure that PPE components:

- Do not interfere with **harness systems, rope systems, or egress**
 - Maintain **mobility and dexterity**
 - Are **compatible with communication systems**
 - Do not introduce additional hazards (e.g., snagging, heat stress)
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Applicable regulations and acts

- [Occupational Health and Safety Act](#)
 - clause 25(1)(b) for maintaining equipment in good condition
 - clause 25(2)(h) for taking every precaution reasonable in the circumstances to protect workers
 - 25(1)(b.1) any personal protective clothing and equipment that is provided, worn or used is a proper fit and is appropriate in the circumstances, having regard to all relevant factors, including such factors as may be prescribed
 - 25(1)(d) the equipment, materials and protective devices provided by the employer are used as prescribed

Applicable standards

[NFPA 2500 - Standard on Organizational Capabilities for Technical Search and Rescue and Life Safety Rope and Equipment for Emergency Services](#)

Related

Read firefighter guidance note:

- [4-2 Eye protection](#)

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This **resource does not replace the *Occupational Health and Safety Act* (OHSA) and its regulations and should not be used as or considered legal advice.** Health and safety inspectors apply and enforce these laws based on the facts they find in the workplace.