Module 3 - Unit 1
Mission Specific Competencies:
Personal Protective Clothing

Scope of Unit
The purpose of this lesson is to train the operations level responder with a mission specific competency in Personal Protective Clothing in selecting and using specialized chemical personal protective equipment (PPE).

Learning Objectives
At the end of this unit of training each student will demonstrate the ability to plan and implement a response to a HazMat incident by selecting and using specialized chemical protective equipment.

Student Performance Objectives
- Know the two major types of respiratory protection and the advantages and disadvantages of each type.
- List the 8 items that must be known in order to safely wear an air purifying respirator.
- List the 4 levels of chemical protective ensembles and give the advantages and disadvantages to each level. Given pictures or descriptions of each ensemble, correctly identify the EPA level.
- List the 3 terms that identify the chemical resistance of an ensemble.
- Identify the signs and symptoms of the 4 heat stresses.
- Correctly and proficiently don and doff Level A, Level B, Level C and/or any other ensemble of the AHJ.

Resource List
- Manual
- Level A, Level B and Level C ensembles
- Dress-out checklists
- Pen / Pencil

References
- The Ohio HazMat/WMD technician Manual
**Unit Agenda 3-hour segment**

- 15 minutes - Course introduction and mission specific overview
- 60 minutes – Lecture and unit test
- 105 minutes - Hands on dress-outs with AHJ PPE

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| 6.2.4.1 | Don work in and doff PPE  
1) Describe at least 3 safety procedures  
2) Describe at least 3 emergency procedures  
3) Demonstrate donning and doffing  
4) Demonstrate the local technical decon process  
5) Describe maintenance, testing, inspection, storage and documentation. |

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Module 3 Unit 1
Personal Protective Equipment

Operations level responders with a personal protective equipment (PPE) mission specific competency are required to properly select and use the specialized chemical (PPE) provided to them by their employer. Your employer should provide you with PPE based upon the role that you will be expected to perform at an incident.

NOTE: The selection and use of PPE requires:
- Training;
- Medical evaluation; and,
- Fit testing.

No personnel should use any type of PPE unless they have been specifically trained in the selection, use, donning, doffing, emergency procedures and limitations of the PPE, and have participated in their employer’s medical evaluation program.

This unit will provide you with generic donning and doffing procedures; however, specific training for your own entities’ ensembles is still required.

Specialized chemical PPE typically consists of an ensemble of some type of respiratory protection and a chemical protective suit. Although this information was introduced at the operations level, the mission specific PPE responder needs to have a greater knowledge and understanding of the specific PPE utilized by their response agency.

Respiratory Protection

There are two basic types of respiratory protection. The first type removes contaminants from the air and is therefore known as an “Air Purifying Respirator” (APR). The second type provides the wearer with a source of clean air under pressure and is known as a “Supplied Air Respirator” (SAR). There are several styles of each of these two basic types that we will detail below.

Air Purifying Respirators (APRs)
APRs are respirators with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element. An APR does not provide the wearer with oxygen.

Most APRs are classified as negative-pressure devices. During inhalation, the pressure inside the mask is lower than the outside atmospheric pressure, which then draws the air through the cartridges. Unfortunately, this also allows inward leakage of contamination, if the face-to-face-piece seal is broken.

**Types of APRs:**

**Quarter-face respirators** cover the nose and mouth; the lower sealing surface rests between the chin and the mouth. They do not provide protection for the eyes or the rest of the face. They are easily dislodged and are not recommended for use by first responder personnel.

**Half-face respirators** cover the chin, mouth, and nose. They do not provide protection for the eyes or the rest of the face. These masks are widely used in industry and chemical cleanup operations. They have very limited use in first responder work.

**Full-face respirators** cover the whole face from the hairline to below the chin. They normally seal well and are hard to dislodge. They provide better protection than half-face APRs. These masks are widely used for chemical cleanup work and have limited application in emergency response.

**Powered APRs (PAPRs)** provide protection by supplying filtered air under a slightly positive pressure. These units will normally have a battery-operated pump. They are commonly used in the lead and asbestos abatement industry. Hooded PAPRs are widely used by hospitals in their emergency decontamination program.

**Mouthpiece respirators** consist of a mouthpiece held in the teeth (the wearer’s lips seal around the mouthpiece) and a clamp that fits tightly over the nostrils to keep the nostrils closed. There is a cartridge mounted to the mouthpiece. This style of respirator eliminates communications, may cause fatigue, and provides little if any protection for the face or eyes. These types of APRs are used as escape-only respirators.
**Limitations of APRs**

First responders rarely use APRs due to the many limitations that are placed upon them by the OSHA. The following items must be known before you can safely wear an APR:

- **Known contaminants**: APRs cannot be used for vapors or gases unless the contaminants have been identified.
- **Known concentration**: APRs cannot be used for vapors or gases unless the actual concentration of the contaminant in the hazard area is known.
- **Oxygen deficiency**: APRs can be used only if the oxygen content is greater than 19.5%.
- **Immediately dangerous to life and health (IDLH) conditions**: APRs cannot be used in IDLH atmospheres.
- **Carcinogens**: APRs are not recommended for cleanup or emergencies involving known human carcinogens.
- **Organic vapors**: Most APRs cartridges are not recommended for use if the total organic vapor concentration is above 1,000 ppm.
- **Reactivity**: Some contaminants may react with the cartridge media and make the media ineffective.
- **Cartridge limitations**: All cartridges have some use limits for the contaminant amount. The manufacturer sets maximum use limits for the specific cartridge and chemical involved. This data must be reviewed prior to wearing the APR.

**Benefits of APRs**

These respirators are relatively simple to use and maintain. There are no cylinders, pressure gauges, or airlines with which to contend. They allow the wearer a high degree of mobility. Personnel with a minimum amount of training and equipment can service APRs. APRs are relatively inexpensive.

**Components of APR’s**

**Cartridges and canisters**: A respirator cartridge or canister is the filter or component that removes contaminants from the air. Canisters have a larger sorbent volume and may be chin-, front-, or back-mounted. They allow for a
longer period of use prior to changing. Cartridges are slightly smaller and may be used as a single or in pairs, depending on the design and manufacture of the mask. Different cartridges and canisters are designed to remove different contaminants.

**Mechanical filters:** This type of filter element offers respiratory protection against airborne particulate matter including dusts, mists, metal fumes, and radon daughters. They do not provide protection against gases or vapors. The most efficient of these is a high-efficiency particulate air (HEPA) filter that is 99.97% efficient in removing particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

**Chemical filters:** These filters protect against various concentrations of certain gases and vapors by adsorbing or neutralizing them. Examples include filters for mercury, acid gases, and ammonia.

**Combination filters:** These are a combination mechanical filter and chemical filter to remove multiple contaminants, vapors, gases, and particulates.

**Cartridge identification:** A different color code or color striping system is used to identify the type of cartridge or canister based on the contaminants it is designed to eliminate.

**Cartridge service life:** The service life of a respirator cartridge depends on several factors, including cartridge design and exposure conditions. Cartridge design includes the quality and amount of chemical or mechanical filter agent, packing uniformity, and density. Manufacturers have quality-control programs to monitor these factors. Exposure conditions include contaminant concentration, breathing rate, temperature, and humidity. Accordingly, high concentrations, rapid breathing, and humid conditions will shorten the effective service life. NIOSH requires that cartridges resist breakthrough for at least 3 minutes at or below IDLH concentrations.

**Cartridge replacement:** APR cartridges will eventually become saturated and/or blocked. The user must recognize when this happens and immediately exit the hazard area to replace cartridges. End-of-service-life indicator (ESLI) is a system that warns the respirator user of the approach of the end of adequate respiratory protection; e.g., that the sorbent is approaching saturation or is no longer effective. The employer may set a time limit for the service life of a particular cartridge in a known environment. The time limit is established to ensure cartridges are replaced routinely. In accordance with 29 CFR, Part 1910.134(d)(3)(B)(2), employers must comply as follows:

> “If there is no ESLI appropriate for conditions in the employer’s workplace, the employer implements a change schedule for canisters and cartridges
that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life.”

This data should include the type of contaminant, concentration of the contaminant, including the average and expected highest levels, and volume of air that will be breathed by the worker performing their assigned tasks. Difficulty in breathing is a sign a cartridge is getting overloaded or clogged. If specific symptoms of exposure occur or dizziness, nausea, or other generic symptoms occur, the worker should leave the work area, remove gear, and breathe fresh air. If an unusual odor, taste, or eye, nose, or throat irritation occurs, this is indication the cartridge is expended or the seal has been broken. In either event, the worker must leave the area. This is also known as “breakthrough”.

**Supplied Air Respirators (SAR)**

SARs are respirators that supply the user with breathing air from a source independent of the ambient atmosphere.

SARs provide the highest level of respiratory protection. The respirators are available in different designs and can be categorized by the type of airflow supplied to the face piece or hood.

Pressure-demand respirators introduce air into the face piece only when the wearer creates a slightly negative pressure by inhalation but maintains a positive pressure in the face piece during both inhalation and exhalation. If a leak develops, such as a momentary break in the face-to-face piece seal, airflow will be outward.

The two primary types of SARs are the self-contained breathing apparatus (SCBA) and line air with escape cylinder. Both systems consist of:

- Regulators to adjust high-pressure air to safe breathing pressures;
- Gauges to determine the remaining air volume;
- Masks or hoods to cover the face;
- Alarm systems to warn of low air;
- Hoses to deliver the air; and,
- Clean air supply.

A third type of SAR is the oxygen generation system.

**Self-Contained Breathing Apparatus (SCBA)**

consists of an air tank mounted on a backpack. The wearer takes the air supply into the contaminated or oxygen-deficient area. These units will provide 30 to 60 minutes of air.
SCBAs provide the highest level of respiratory protection available and allow the wearer almost free movement over an unlimited area; however, they do have some limitations. SCBA limitations include their **weight**, they restrict movement, reduce efficiency, and cause fatigue, **work time**, usually limited to 20 to 40 minutes per bottle of air, **repairs**, only certified technicians can repair damaged or malfunctioning units and **cost**, they are costly to purchase and maintain.

**Line Air with Escape Cylinder** is a unit designed so that the wearer does not carry the air source into the work area. The wearer is connected to the air source by hoses. The unit consists of a full-face mask and a separate emergency-escape bottle. The air source is a bank of compressed breathing-air cylinders or an air compressor with a filtration system. Up to 300 feet of airline can be used with this system.

Line air units also provide the highest level of respiratory protection. Line air units have the benefit of being lighter in weight and offer longer work times than an SCBA. Their limitations include the restriction of 300’ of airline and keeping track of that airline. They are equally as expensive and just as costly to maintain as an SCBA.

**Oxygen Generation Units** are systems that “scrub” out carbon dioxide from the user’s exhaled air, supplement this air with oxygen and then allow the user to re-breathe it. They can provide work times up to 4 hours; however, they are not widely used for HazMat incidents since they produce heat in the “scrubbing” process.

**Chemical Protective Clothing (CPC)**

OSHA and the EPA established guidelines and terminology to address a PPE ensemble. The combination of gear worn (respiratory protection device and type of clothing) establishes the level of protection.

Protection level for all levels can be encapsulating (worn on the outside of the respiratory system) or non-encapsulating (worn underneath the respiratory system). PPE can be gas-tight (designed to provide resistance from gasses and vapors) or as simple as a rain suit designed to protect from a liquid splash. The seams can be sewn (which produces tiny holes for the product to penetrate), sewn and sealed with tape or even “welded” together. Zippers can be of simple plastic or may be of an exotic neoprene with splash covers.

The National Fire Protection Association (NFPA) writes standards for the performance of chemical PPE worn by responders.
CPC ensembles are divided into four categories, Level A, B, C, and D.

**Level D – No or Limited Chemical Protective Clothing**

Level D consists of minimum protection and is generally a work uniform used for nuisance contamination only. Level D protection should be used when the work area is characterized as having no airborne exposure and work functions preclude splashes or the potential for unexpected contact with hazardous levels of any chemicals.

**Level C – Splash Protective Garment and APR**

Level C ensembles consist of an Air Purifying Respirator (APR) and appropriate skin protection. Level C protection may be used whenever chemicals will not absorb into the skin sufficiently to cause a hazard from vapors, gases, liquid splashes, or particulates. They can be used only when the types of air contaminants have been identified, the concentrations are measured, and an air-purifying respirator is available that can remove the contaminants and all criteria for the use of air-purifying respirators are met.

Level C consist of an APR, splash suit, gloves and boots.

**Level B – Splash Protective Garment and Supplied Air Respirator**

Level B ensembles consist of a supplied air respirator and a liquid splash protection garment. It should be used when the type and atmospheric concentration of substances have been identified as requiring a high level of respiratory protection but the chemicals involved are not highly corrosive or injurious to the skin.

Level B is the minimum level of protection for an IDLH condition, and is the minimum level of protection to enter an unknown site during an emergency response. OSHA and EPA require a minimum of Level B if the atmosphere contains less than 19.5% oxygen, or if there is the presence of incompletely identified vapors or gases as indicated by a direct-reading organic vapor-detection instrument, but the vapors and gases are not suspected of containing high levels of chemicals capable of being absorbed through the skin.
Level B ensembles consist of an SAR, splash suit, inner and outer gloves and boots.

Level B ensembles are also available in encapsulating versions (The SCBA is worn inside the suit). This version has the advantage of protecting the respiratory equipment from being damaged from the chemical splash. The disadvantage of an encapsulating Level B is its bulkiness. This suit can be just as hard to work in as a Level A ensemble.

**Level A – Vapor-Tight Garment and Supplied Air Respirator**

Level A ensembles consist of a SAR (usually SCBA) in combination with a vapor-tight suit. Level A is the highest level of chemical protection. It should be used whenever the situation requires the best protection for skin, eyes, and the respiratory system. This includes operations that involve a high potential for splash, immersion, or exposure to vapors, gases, or particulates that are harmful to skin and/or can be absorbed through the skin.

Vapor-tight, chemical-protective suits shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape. You must also wear Level A when operations must be conducted in poorly ventilated areas with unknown conditions or chemicals present.

Level A ensembles consist of a vapor tight suit, inner and outer gloves, SAR, and boots.

*Note: Combinations of PPE other than those described for Levels A, B, C, and D protection may be more appropriate for a specific hazard and may be used to provide the proper level of protection.*
Combinations

There is currently no combination of PPE that can provide adequate protection from a flash fire resulting from a flammable and/or explosive environment. Entry teams should use air monitoring equipment to determine the presence of flammable vapors. The presence of flammable vapors might increase the risk enough to abort the entry.

Level B or C over SFPC

A good level of protection for many HazMat incidents is a Level B protective ensemble worn over Structural Firefighting Protective Clothing (SFPC). This combination gives some protection from the heat of an unexpected flash fire and a layer of contamination protection to the expensive fire gear. The level is excellent for entering unknown atmospheres for recon activities (to determine atmospheric levels and/or product identification. This combination can also be worn with an APR instead of an SAR to achieve Level C protection.

Selection of PPE

Choosing PPE is one of the most difficult decisions a HazMat responder can make. This decision should be based upon the likely route of entry of the chemical into the body, the signs and symptoms of any victims and if they are getting better or continuing to get worse (even after removal from the area and decontaminated), the degree of contact anticipated with the chemical, the specific task to be performed by the wearer and the anticipated duration of exposure. Very few chemicals produce vapors that can be quickly absorbed into the body and produce severe injury. The decision on what level of ensemble should be balanced against the physical hazards inherent to each suit. Responders have a greater chance of slips, trips, and falls in Level A suits than in Level B. Level C would be the easiest of the three to work in.
OSHA says that prior to wearing PPE, engineering controls and work practices should be instituted to reduce exposure to the chemical. Engineering controls include ventilation, applying foam, remotely shutting valves, allowing a cylinder to empty and/or just delaying entry until the atmosphere is safer. Work practices includes; limiting personnel from the area, operating up wind and not kneeling in the products.

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<th>Disadvantages</th>
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<td>A</td>
<td>High respiratory&lt;br&gt; High skin protection&lt;br&gt; Protection for the SCBA</td>
<td>Cumbersome&lt;br&gt; No thermal protection</td>
<td>Chemicals with extremely high toxicity to the skin&lt;br&gt; Unknown chemical Incidents with high fatality rates</td>
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<td>B</td>
<td>High respiratory&lt;br&gt; Splash protection&lt;br&gt; Easier to work in the Level A.</td>
<td>Open areas&lt;br&gt; Exposed SCBA&lt;br&gt; No thermal protection</td>
<td>To determine unknown chemicals when there is no flammability readings.</td>
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<tr>
<td>C</td>
<td>Splash protection&lt;br&gt; Easier to work in the Level A or B.</td>
<td>Open areas&lt;br&gt; Exposed APR&lt;br&gt; No thermal protection</td>
<td>Known chemicals with known atmospheres.</td>
</tr>
<tr>
<td>SFPC</td>
<td>High respiratory&lt;br&gt; Familiar to most responders&lt;br&gt; Easier to work in the Level A.&lt;br&gt; Some thermal protection</td>
<td>No splash protection&lt;br&gt; Exposed SCBA&lt;br&gt; Contamination of SFPC</td>
<td></td>
</tr>
<tr>
<td>B over SFPC</td>
<td>High respiratory&lt;br&gt; Splash protection for SFPC&lt;br&gt; Easier to work in the Level A&lt;br&gt; Some thermal protection.</td>
<td>Open areas&lt;br&gt; Exposed SCBA</td>
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**Chemical Resistance**

The ability of a suit to withstand the nature of the work and the chemical or physical agent that it will contact is very important. The importance of performance factors in the selection process is based on the site conditions and activity of the wearer.

Chemical resistance is the ability of the garment to withstand the migration of a chemical through or around its material. Ideally, the chosen garment’s material(s) must resist permeation, degradation, and penetration by the respective chemicals.
**Permeation** is a process by which a chemical passes into or through a protective film on a molecular level. In some cases, the permeated material appears unchanged to the human eye. Chemical permeation can be described in simple terms by comparing it to what happens to the helium in an inflated balloon after several hours. Although there are no holes or defects and the balloon is tightly sealed, the helium gradually goes through (permeates) the balloon’s walls and escapes. In this simple example, we are using gas permeation, but the principle is the same with liquids passing through some type of film or coating by liquid permeation.

Permeation breakthrough time is the most common data used to assess a material’s chemical compatibility. The rate of permeation is a function of several factors such as chemical concentration, material thickness, humidity, temperature, and pressure.

Most material testing is done with 100% chemical liquid or vapor contact over a measured time-period. The time it takes the chemical to permeate through the material is the breakthrough time. An acceptable material is one where the breakthrough time exceeds the expected period of garment use. However, temperature and pressure effects may enhance permeation and reduce the magnitude of this safety factor. For example, small increases in ambient temperature can significantly reduce breakthrough time and the protective barrier properties of a protective clothing material.

**Degradation** is a reduction in one or more physical properties of a glove or protective clothing due to contact with a chemical. Exposed products may get harder, stiffer and/or brittle, or they may get softer, weaker, and swell to several times their original size or even begin to change color. Although degradation resistance testing alone is not enough, it is essential to worker safety.

**Penetration** is the flow of a chemical through zippers, stitched seams, pores, or imperfections in the material. In selecting chemical-resistant clothing, it is important to choose styles that are designed to resist penetration in these critical areas. Gloves and clothing that can be penetrated are designed only to prevent cuts, abrasions, thermal burns, and other similar hazards and are not suitable for use with hazardous chemicals.

It is important to note that no material protects against all chemicals or combinations of chemicals, and that no currently available material is an effective barrier for any prolonged chemical exposure.

PPE Safety
As previously stated, it is important to understand that the use of PPE is not risk-free. There are certain risks associated with wearing any protective clothing ensemble. The greatest of these risks is heat stress.

Heat stress can cause serious medical problems, including heat rash, heat cramps, heat exhaustion and heat stroke. Personnel working in CPC should rehab frequently. Responders should know the symptoms of the two more serious forms of heat stress.

The symptoms of heat exhaustion include profuse sweating, cool clammy skin, fatigue, increased heart and respiratory rate, decreased blood pressure and sometimes a change in level of consciousness and/or nausea. Treatment for heat exhaustion includes: moving the victim to a cooler location, hydrating with water (by mouth if the patient is alert) and treating for shock.

The symptoms of heat stroke differ from heat exhaustion. Heat stroke can be rapidly fatal if not treated. In heat stroke, the body’s temperature regulating mechanism has failed and the core temperature will be rising rapidly. The skin will be flushed, the respiratory and pulse rates will elevate, the blood pressure will be normal or increase, but the patient will not be producing any new sweat. If the victim was wearing PPE, their clothes may be wet with previous sweat inside the suit, but their skin will likely be dry. Treatment for heat stroke involves moving the patient to a cooler area, removing PPE and rapidly covering the patient’s exposed skin with wet sheets or towels to allow evaporation. They should receive IV fluid replacement and be transported to the hospital.

The best idea is to prevent heat stress by drinking plenty of water, reducing work periods during high temperature or humidity, frequently rotating work crews and minimizing waiting time in PPE.

Cooling vests can also be used to reduce heat stress. Various types and manufacturers are available including:

- Air cooled;
- Ice cooled;
- Water cooled; and,
- Phase change cooling. This type of cooling technology utilizes a product with a higher freezing temperature than water. Thus at 50 degrees it is a solid, as it melts it removes heat from the wearer. The higher melting point prevents frostbite that can be received from using ice cooled vests.

Certain factors can increase an individual’s likelihood of developing heat stress injuries. These include:
• Age (older individuals tolerate heat less well than younger people);
• Physical condition (the better your physical condition the better you will tolerate heat);
• Medications (some prescription and non-prescription meds increase the likelihood of heat stress);
• Acclimation (those acclimated to the heat have less heat stress);
• Prior activities (prior emergencies or physical activity increase heat stress);
• Hydration (you must drink water to avoid heat stress, thirst is a poor indicator); and,
• Humidity (the higher the humidity, the more the heat stress).

NFPA Standards

The National Fire Prevention Association (NFPA) writes standards for chemical protective clothing. NFPA 1991 is the “Standard On Vapor-Protection Ensembles For Hazardous Materials Emergencies” and NFPA 1992 is the “Standard On Liquid Splash-Protection Ensembles And Clothing For Hazardous Materials Emergencies”. These standards are the bases for the construction of the suits and accessories that make up level A (vapor protection), and level B & C (splash protection) ensembles. These standards also set forth the requirements for initial testing and on going re-testing of the materials.
Module 3 - Unit 1
Mission Specific Competencies: Personal Protective Clothing
Review Quiz

1. What are the two major types of respiratory protection?
   a. Gas mask and SCBA
   b. APR and SAR
   c. SCBA and in-line air
   d. SCUBA and SCBA

2. Which of the following is an advantage of using an SCBA?
   a. Unlimited air supply
   b. Lighter than in-line air
   c. Higher protection level than an APR
   d. Fire safety

3. Which of the following is one of the seven items that must be known before you wear an APR?
   a. Oxygen content of the atmosphere
   b. Name of chemical
   c. Cartridge limitations
   d. All of the above are one of the seven

4. Which one of the below is an advantage of a Level B ensemble over a Level A ensemble?
   a. Level B is easier to work in
   b. Level B is a higher level of protection
   c. Level B has better degradation properties
   d. Level B is usually hotter to wear

5. Which one of the below is an advantage of a Level C ensemble over a Level B ensemble?
   a. Level C will provide you with longer work times
   b. Level C provides you with hotter working conditions
   c. Level C is brighter in color
   d. Level C can be worn in oxygen deficient atmosphere

6. Break-thru time measures...
   a. Permeation
   b. Degradation
   c. Penetration
   d. Detoxification
7. If the chemical is capably of actual dissolving the chemical suit…this is know as?
   a. Permeation
   b. Degradation
   c. Penetration
   d. Detoxification

8. Dry hot skin could be a sign for?
   a. The heartbreak of psoriasis
   b. Heat cramps
   c. Toxemia
   d. Heat Stroke

9. Glove compatibility is the direct responsibility of…?
   a. Incident Command
   b. Lead Tender Timer
   c. Decon Team Leader
   d. Research Officer

10. The highest level of respiratory protection and the highest level of skin protection describes…?
    a. Level A
    b. Level B
    c. Level C
    d. Level D
Tender/Timer Checklist Level "A"

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressing Tarp</td>
<td>Stools</td>
</tr>
<tr>
<td>1 Hr SCBAs</td>
<td>Cooling Vest</td>
</tr>
<tr>
<td>Chemical Boots</td>
<td>EMS gloves</td>
</tr>
<tr>
<td>Radios</td>
<td>Duct tape</td>
</tr>
<tr>
<td></td>
<td>Flashlights</td>
</tr>
<tr>
<td></td>
<td>Level &quot;A&quot; suits</td>
</tr>
<tr>
<td></td>
<td>Tyvek suits</td>
</tr>
<tr>
<td></td>
<td>Personal effects bag</td>
</tr>
<tr>
<td></td>
<td>Towel</td>
</tr>
</tbody>
</table>

___ Suit compatibility checked with lead tender
___ Medical evaluations performed
___ Personal effects and fatigue shirt removed and secured
___ Put on cooling vest if needed
___ Tyvek suit donned
___ EMS gloves donned and taped
___ SCBA donned without mask
___ Towel and radio secured and on proper channel (channel ____)
___ Record cylinder psi and determine work-time with lead tender
___ Review emergency procedures, and monitoring guidelines
___ Confirm decon is set up and review decon procedures
___ Level "A" suit partially donned
___ Chemical boots donned
___ Review action plan with command
___ Don facepiece, put hood up on tyvek suit, don helmet and/or ear protection if needed
___ Turn on air for entry team, hook up facepiece, record time
___ Activate PASS device, seal suit, check zipper
___ Visually inspect suit and evaluate personnel, take flashlight
### Tender/Timer Checklist Level "B"

<table>
<thead>
<tr>
<th>Dressing Tarp</th>
<th>Stools</th>
<th>Cooling Vests</th>
<th>EMS gloves</th>
<th>1 Hr SCBAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct tape</td>
<td>Flashlights</td>
<td>Chemical Boots</td>
<td>Level &quot;B&quot; suits</td>
<td></td>
</tr>
<tr>
<td>Tyvek suits</td>
<td>Radios</td>
<td>personal effects bag</td>
<td>Chemical gloves</td>
<td></td>
</tr>
</tbody>
</table>

___ Suit and glove compatibility checked with lead tender

___ Medical evaluations performed

___ Personal effects removed and secured

___ Tyvek suit partially donned

___ Put on cooling vest if needed

___ Level "B" suit partially donned, chemical boots donned

___ EMS gloves donned

___ Finish donning Tyvek suit

___ 2nd pair of EMS gloves donned and taped

___ Finish donning Level "B" suit

___ Silver shield gloves donned and taped

___ Chemical gloves donned

___ SCBA donned without mask

___ Record cylinder psi and determine work-time with lead tender

___ Radio secured and on proper channel (channel _____)

___ Review emergency procedures, and monitoring guidelines

___ Confirm decon is set up and review decon procedures

___ Review action plan with command

___ Don facepiece, put hoods up, don helmet and/or ear protection if needed

___ Turn on air for entry team, hook up facepiece, record time, visually inspect suit and evaluate personnel, activate PASS
### Tender/Timer Checklist Level "B" with fire gear

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressing Tarp</td>
<td>Stools</td>
</tr>
<tr>
<td>1 Hr SCBAs</td>
<td>Duct tape</td>
</tr>
<tr>
<td>Level &quot;B&quot; suits</td>
<td>Turn-out gear</td>
</tr>
<tr>
<td>Personal effects bag</td>
<td></td>
</tr>
<tr>
<td>Cooling vests</td>
<td>Flashlights</td>
</tr>
<tr>
<td>EMS gloves</td>
<td>Radios</td>
</tr>
<tr>
<td>Chemical boots</td>
<td>Chemical gloves</td>
</tr>
</tbody>
</table>

- ___ Suit and glove compatibility checked with lead tender
- ___ Medical evaluations performed
- ___ Personal effects removed and secured
- ___ Put on cooling vest if needed
- ___ Don full turn-outs including hood, (No FF gloves or boots).
- ___ Level "B" suit partially donned, chemical boots donned
- ___ EMS gloves donned
- ___ Finish donning level "B" suit
- ___ Silver shield gloves donned and taped
- ___ Nomex gloves donned
- ___ SCBA donned without mask
- ___ Record cylinder psi and determine work-time with lead tender
- ___ Radio secured and on proper channel (channel _____)
- ___ Review emergency procedures, and monitoring guidelines
- ___ Confirm decon is set up and review decon procedures
- ___ Review action plan with command
- ___ Don facepiece, put hoods up, don helmet and/or ear protection if needed
- ___ Turn on air for entry team, hook up facepiece, record time, visually inspect suit and evaluate personnel, activate PASS