TAMUCC
Fire Safety Training
TAMUCC Fire Safety Meeting

Fire – Chemistry, Classification, Types
Fire Fighting
Fire Prevention
Fire Detections
Fire Safety Activities
Fire: A rapid oxidation of material during which heat and light are emitted.
Four things must be present at the same time in order to produce a fire:

1) Enough **OXYGEN** to sustain combustion,
2) Enough **HEAT** to raise the material to its ignition temperature,
3) Enough **FUEL** to feed the combustion process,
4) And the **CHEMICAL, EXOTHERMIC REACTION** that is fire.
Physics & Chemistry of Fire

- **Ignition**: Initiation of combustion.
  - **Ignition Temperature**: Temperature must reach for ignition to occur.
  - **Piloted Ignition**: Ignition process caused by external sources (sparks, flame, ember, etc.)
  - **Auto-Ignition, Spontaneous Ignition or Spontaneous Combustion**: Ignition process where there is no external source.
Fire Life Safety

• Human Behavior in Fires:
  – Under the stress of a fire, people do not always behave logically.
  – The number of people, routes, distance to the exterior can affect human’s behavior.
  – Personal conditions (age, health, mobility, previous drill, etc.) may influence how people behave.
  – The behavior of one person may influence the behavior of the others.

• STAY CALM!
Fire Life Safety

• Classes of Fire

A: Combustible solids
B: Flammable liquids
C: Flammable gases
D: Combustible liquids
K: Electrical fires
Portable Fire Extinguishers—Fire Classes

• **Class A Fire**: common combustibles such as wood, paper, cloth, etc.

• **Fighting Class A Fire at TAMUCC**:  
  - Use water  
  - Class ABC fire extinguisher
Fire Prevention Activities

Housekeeping:

– Don’t store excessive combustible materials in your areas.
– Keep the isles clear from and ready for emergency exit.
– Keep combustible materials off all stairways or exit paths.

“All places of employment, passageways, storerooms, and services rooms shall be kept clean and orderly and in a sanitary condition” - OSHA1910.22(a)
• Exit marking
Material storage
Material storage
Portable Fire Extinguishers—Fire Classes

• Class B Fire: Flammable, combustible gases and liquids such as solvents, gasoline, kerosene, paint, paint thinner, propane

• Fighting Class B Fire at TAMUCC: Use class ABC fire extinguisher
Portable Fire Extinguishers—Fire Classes

Preventing Class B Fire:
• Store flammable liquids in Flammable Cabinets, away from spark-producing sources.
• When using portable container for flammable liquid, make sure it is sealed, self-closing, and spill-proof.
Portable Fire Extinguishers—Fire Classes

Preventing Class B Fire:
• Don't refuel gasoline-powered equipment while it's hot.
• Don't refuel gasoline-powered equipment in the presence of an open flame.
• Use flammable liquids only in well-ventilated areas.
Portable Fire Extinguishers—Fire Classes

• Class C Fire: Live electrical equipment such as appliances, switches, or power tools

• Fighting Class C Fire at TAMUCC: Use class ABC fire extinguisher
Portable Fire Extinguishers–Fire Classes

Preventing Class C Fire:
• No frayed or worn extension cords
• Never remove the ground prong
• Never overload the circuit
• When in doubt, ask the Electrician
• Don’t plug more than one heat producing appliance into an outlet
Fire Prevention Activities

Preventing Class C Fire

• Ensure extension cords of 15 amps or less are Underwriters Laboratories (UL) or Factory Mutual (FM) approved

• Contact the Physical Plant electricians so they can ensure extension cord greater than 15 amps that do not have UL or FM seal are rated to handle the specific load of the equipment.
Fire Prevention Activities

Preventing Class C Fire

• Extension cord placed on or above the ceiling plenum-rated cabling
• No power strip is used in series
• No power strip in used in combination with an extension cord
• No multiple power strips used in a multiple plug adapter
• No multiple appliances (refrigerator, microwave, etc.) plug into one power strip.
Portable Fire Extinguishers—Fire Classes

• Class K Fire: Cooking oils and fats
• Fire hazard in commercial kitchens with deep fryers.

• Fighting Class K Fire: Use class K fire extinguisher
Portable Fire Extinguishers

TAMUCC Fire Extinguishers
• Carbon dioxide (BC)
• Multi purpose dry chemical (ABC)
• Potassium acetate based (K)
Types of Fire Extinguishers

Dry chemical extinguishers (ABC)
- Monoammonium phosphate & Pressurized using Nitrogen
- Separates the FUEL from the OXYGEN in the air.
- Interrupts CHEMICAL REACTION.
Types of Fire Extinguishers

Dry chemical extinguishers  (ABC)
Types of Fire Extinguishers

Carbon Dioxide (BC)

- Displaces some of the OXYGEN element.
- Takes away some of the HEAT element.
- Carbon dioxide may be ineffective at extinguishing Class A fires because they may not be able to displace enough oxygen to completely put the fire out causing class A materials to be able to smolder and re-ignite.
Types of Fire Extinguishers

Carbon Dioxide (BC) Fire Extinguisher

- Does not leave a harmful residue
- Is a great candidate for an electrical fire on a computer and other electronic devices
Types of Fire Extinguishers

• Potassium acetate based
  – Low PH agent
  – Puts out kitchen oil fire
  – Agent discharges as a fine mist which helps prevent grease splash and fire reflash while cooling appliance
Portable Fire Extinguishers

- Mounted
- Located
- Identified

Workers can access them without subjecting themselves to possible injury.
Maintaining Portable Fire Extinguishers

- Fully charged and in operable condition
- Placed in designated places at all times except during use
- Annual maintenance check
- Maintenance tag
Using a Fire Extinguisher – P A S S

- Pull the Pin at the top of the extinguisher.
- Aim at the base of the fire, not the flames.
- Squeeze the lever slowly.
- Sweep from side to side.

EVACUATE IMMEDIATELY WHEN HAVING THE SLIGHTEST DOUBT OF YOUR ABILITY TO FIGHT A FIRE
PASS

1. Pull Pin
2. Aim
3. Squeeze
4. Sweep

Tamper Seal
Portable Fire Extinguishers

– Locate Close to likely fire-risk area, but not so close that they would be damaged or cut off by the fire.
– Locate along normal path of exit from the building, preferably at the exits.
– In small rooms or enclosed spaces, locate them outside the door, not inside the room.
– Clear sign and marking to announce the location of a fire extinguisher in the area.
– Maximum travel distance to extinguisher: 75 feet for A or D hazards, 50 for B, C.
• Availability of a fire extinguisher
Fire Evacuation

• Proceed calmly and orderly, but NOT quickly
• Never use an elevator during a fire.
• Close the door if you are the last one out, but do not lock it.
• Keep low on the ground if smoke is already present in the building.
• If possible, cover your nose and mouth with a damp cloth to help you breathe.
• Once you are safely outside the building, report to UPD by calling 4444 immediately.
Fire Safety – If you are Trapped

• Don’t panic.
• If possible, call UPD at 4444 and state your exact location.
• Never open a closed door without feeling the door first with the back of the hand. If the door is hot, find another exit.
• Wave for attention at the window if there is one in the room
• STAY LOW TO THE GROUND.
Fire Prevention - Means of Egress

- Fire Door:
- Withstand fire, heat, smoke
- Rating from 20 minutes to 3 hours
- Office door to hallway should be at least 20-minute fire door
What’s wrong with this picture?
Means of Egress - Doors

• “EXIT” sign must be clearly and visibly posted on all exit doors
• “NOT AN EXIT” sign must be clearly and visibly posted on doors that can be mistaken for an exit.
Means of Egress - Doors

• Exit Door Swing
  – Must be able to open to a full width.
  – Doors shall swing in the direction of egress travel where serving a room with an occupant load of 50 or more.
  – Doors shall swing in the direction of egress travel where it is used in an exit enclosure (ex. stairway,) or in a high hazard area.

• Exit Door must be equipped with panic hardware (push bar) in area having an occupant load of 100 or more.
Means of Egress

• Corridors and hallways must be:
  – at least 44” wide for area with an occupant load of 50 or more
  – At least 36” wide for area with less than 50

• Evacuation route if needed, must be posted at eye level in area where the exit path is not immediately obvious.
Exit Marking

- If the direction of travel to the exit or exit discharge is not immediately apparent, signs must be posted along the exit access indicating direction to the nearest exit.
- The line-of-sight to an exit sign must clearly be visible at all times.
Fire Prevention Activities

• Fire Drills:
  – Verify adequacy of emergency equipment, emergency response team, conditions of fire exits
  – Train occupants to evacuate orderly and assemble at designated safe locations.
  – Sufficient frequency to familiarize occupants with the drill procedures and to establish conduct of a drill as a matter of routine.
  – Suitable procedures to ensure that all persons subject to the drill participate.
  – Emphasize an orderly evacuation rather than on speed.
Fire Prevention Activities

• Fire Inspections:
  – You should conduct periodic fire inspection in your area using a checklist.
  – Examples of items on the checklist:
    • Clearance of means of egress
    • Fire doors, aisles, exits
    • Portable fire extinguishers
    • Alarms and communication systems
Fire & Explosion Hazard from Compressed Gas Cylinders
Compressed Gas Hazards

• Handle all compressed gas cylinder with extreme caution
• All cylinders should have caps or regulators
• Check all equipment and components prior to use
• Cylinders must be stored upright and secured at a point approximately 2/3 of its height
Compressed Gas Hazards

- Oxygen and fuel gas cylinders must be stored at least 20 feet away from each other.
- Close cylinder valves when work is completed or left unattended during breaks, etc.
- Make sure the cylinder is secured to the cart during transport.
- NEVER MODIFY, REPAIR, ALTER, OR TAMPER WITH GAS CYLINDERS.
Compressed Gas Hazards

Acetylene Safe Storage

- Store acetylene upright
- Inside a building, acetylene should be at least 20 feet away from an Oxygen cylinder. If there is no room to store them well separated, there must be a non-combustible partition at least 5 feet high with a Fire resistive rating of one hour between them
Fire Prevention Activities

• Hot Work Permit:
  – When hot work is performed, a hot work permit is required to ensure fire safety in the work area.
Hot Work Permits

What is a “Hot work permit”?

• A mean to communicate fire hazard and recordkeeping of activities that involve hot work.

• A step-by-step checklist for hot work fire safety

• A reminder to workers and supervisors of their responsibility of fire prevention
Hot Work Permits

When is it needed?

• When an operation involving open flames or producing heat and/or sparks that is **outside any authorized locations** for hot works.

• 35’ radius from exposed combustible materials
Hot Work Permits

How does it work?

• Before a worker can perform hot work in an area outside the authorized locations, he needs a Hot Work Permit from his Supervisor or the Supervisor’s designated person.

• E,H&S, the Supervisor, or his designee will come to the building/area where the work will be performed to evaluate the area, complete a checklist, and issue a permit to the worker for a specified time period for the specific location.
Hot Work Permits

How does it work?

- The worker performs the hot work, following the precautions outlined on the permit.
- During the hot work operation and after it is completed, a fire watch is required to monitor the area for a specified time (30 or 60 minutes).
- Sometimes, the area must be monitored for three hours after the work is completed.
- Sign off the form, and return it to EH&S.
QUIZ TIME

• Now that you’ve reviewed the materials, please take a few minutes to take the quiz.
• To take the quiz, click on this link.
• You must get a score of 100% correct to pass.
• [http://www.jotform.com/form/12785247996](http://www.jotform.com/form/12785247996)