

FIRE BEHAVIOR:

1. FIRE TRIANGLE; HEAT, FUEL, OXYGEN

2. IGNITION TEMPERATURE (SOLIDS/GASES)

3. FLASH POINT (LIQUIDS)

4. IGNITION SOURCES:
 - A. Chemical (chemical reaction including spontaneous heating)
 - B. Electrical
 - C. Mechanical (static, friction)
 - D. Open flame
 - E. Excessive heat

5. METHODS OF FIRE SPREAD:
 - A. Convection (gases/ vapors above the flame)
 - B. Radiation (heat from a flame)
 - C. Conduction (through a solid medium; Pipe, wall,)

6. ROUTES OF FIRE SPREAD

Vertical, then horizontal to an opening and then vertical again

7. CLASSIFICATION OF FIRES:

- **Class A (ordinary combustibles)**
- **Class B (flammable liquids/gases)**
- **Class C (electrical)**
- **Class D (combustible metal)**

8. MAIN CAUSES OF FIRES IN STRUCTURES:

- Electrical
- Heating equipment and combustibles too close
- Smoking
- Arson

9. HOW FIRES ARE EXTINGUISHED:

- A. Cooling solid to below ignition temp
- B. Shutting off flow of gas (LPG or Natural gas)
- C. Smothering
- D. Remove the fuel
- E. Remove the heat source
- F. Absorbing excessive heat
- G. Cooling combustible liquid to below flash point
- H. Use of foam on flammable liquid
- I. Stopping the chemical reaction

10.HOW FIRE SPREAD IS STOPPED:

- Fire sprinklers
- Fire walls
- Fire doors
- Distance between combustibles

SOME COMMON FIRE HAZARDS IN INDUSTRIAL FACILITIES/OFFICE BUILDINGS:

- Frayed electrical cords, faulty electrical equipment
Octopus wiring, non-listed power taps, overloaded circuits.
- Combustibles too close to heating appliances/ electrical panels.
- Faulty heating equipment, boilers, etc
- Static electricity
- Poor housekeeping
- Illegal smoking by employees
- Flammable and combustible liquids/vapors
- Hazardous materials
- Chemical reactions
- Open flames near combustibles, flammable liquids and gases.
- Welding and hot work

- Oily rags heating up
- Portable heating equipment
- Cooking
- Dust accumulations/ clouds
- Spray painting, dipping, coating
- High Piled stock not properly protected
- Combustible storage
- Trash cans, lids, removal from building daily

10.COMMON ITEMS WHICH CAN EFFECT LIFE SAFETY, FIRE CONFINEMENT, AND EXTINGUISHMENT:

- Blocked, locked, or inadequate exiting
- Fire doors blocked open
- Holes in fire walls
- Improperly designed/ installed ventilation systems
- Sprinkler system design. Coverage inadequate for the risk. (Occupancy changed, walls or rooms added, high piled stock not protected, no coverage in various areas)
- H occupancy being conducted in non H building
- Lack of fire extinguishers
- Lack of employee alarm system

- Lack of emergency lighting
- Excessive fire loading in the building
- Lack of spill control/ secondary containment
- Combustible wall coverings

11. HOW TO CONDUCT AN INSPECTION:

- Have a systematic approach and route
 - Use a checklist (mind jogger and documentation)
 - Follow the process from start to finish
 - Inspect all rooms and areas
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- A. Exits; hardware, signs, lighting, adequacy, visibility, obstructions
 - B. Corridors/ aisles blocked or inadequate
 - C. Combustible storage
 - D. Proper disposal of oily rags
 - E. Proper handling of trash and daily removal from building
 - F. Combustibles within 30” of electrical panels
 - G. Electrical and fire alarm, sprinkler riser rooms labeled
 - H. High piled stock within allowable limits for approved systems.
 - I. Stock 18” below sprinklers; 2’ below ceilings

- J. Electrical cords, power taps, equipment, overloaded circuits (check under all desks)
- K. Overheated computers, power supplies, etc.
- L. Flammable and combustible liquids, gases, hazardous materials; storage, use and handling.
- M. Secondary containment and spill control
- N. Combustibles too close to heating equipment
- O. Open flames
- P. Grounding and bonding of processes
- Q. Ventilation and exhaust systems adequate?
- R. Fire walls and fire doors
- S. Holes in walls
- T. Combustible materials on walls/ ceiling
- U. Fire Extinguishers serviced/ tagged/ adequate number & type.
- V. Alarm systems/ detectors operable
- W. Fire sprinkler coverage adequate? Valves open?
- X. Dip tanks with lids propped open to fusible link wont work
- Y. Spray booths and filters clean
- Z. Electrical equipment not explosion proof in a classified area.

EXTERIOR AREAS:

- A. Combustible storage too close to buildings (dumpsters to be 5' away from building, or sprinklered enclosure)

- B. Storage of Flammable and combustible liquids, hazardous materials
- C. Vegetation
- D. Crash protection around tanks, gas meters and piping
- E. Fire Department access
- F. Street addresses/ building numbers
- G. KNOX box
- H. Fire Department sprinkler connection accessible
- I. Sprinkler valves on?
- J. Sprinkler bell intact

TIPS FOR CONDUCTING INSPECTIONS:

- Plan enough time to do a good inspection
- Eliminate distractions (cell phone, pager, etc)
- Don't be accompanied by someone who over communicates (distracting).
- Exercise investigative curiosity. Don't just take anyone's word for something.
- Ask questions when you need to understand the process
- If it doesn't look right, it probably isn't

- If it looks messy it is probably also a fire hazard
- Just because they have “ always done it this way” doesn’t make it safe.
- Think about how occupants would be notified and escape
- If you can smell strong vapors, there may be a ventilation problem and potential explosion problem.
- Excessive dust, fine metal flakes, etc, can result in a dust explosion
- If you can see suspended dust or vapor; you may have an explosion hazard.
- Check all flammable, combustible liquids, gases, hazardous materials for exempt quantities
- Don’t be afraid to ask for help
- Document the inspection
- Conduct inspections annually.