Emergency Evacuation, Fire Safety & Fire Extinguisher Use
The Building Emergency Evacuation Plan is a means of ensuring that a building evacuation will take place with a minimum of confusion and time and a maximum of control and safety. The Calgary Fire Department makes such a plan mandatory.
Emergency Evacuation

Goal

- To evacuate the building in a timely manner, secure the area to reduce flame spread, other emergencies, and to go directly to the designated assemble point.
The actions to be taken by occupants in emergency situations:

Upon discovery of Fire

- Leave the fire area
- Activate fire alarm system, by Pulling the nearest Fire Alarm Pull Station.
- Close all doors behind you
- Call Campus Security (403 220-5333) from a safe place.
- Do not use the elevators.
- Do not return until the Fire Official & Campus Security has declared the situation safe.
The actions to be taken if Unable to Leave Room:

- Close the Door.
- Do not lock the door in the event fire fighters may need to enter.
- Seal all cracks where smoke may get in by using sweaters or jackets or wet material (if available) (e.g., under the door, air conditioning, and heating vents).
- If you require assistance for evacuation, dial 911 and tell the Calgary Fire Department where you are.
- Crouch low to the floor if smoke comes into the room.
- Remain calm and wait to be rescued. Do not consider jumping.
General

Occupants are advised to:

- Be fully acquainted with the fire protection installations that are provided for your safety.
- Know where the fire extinguishers are located, as well as the fire alarm pull stations and all floor fire exits.
- Call Campus Security at 403 220-5333 if you need emergency assistance.
- Know the address of your building and the Building Name.
- Your building maybe fully sprinklered. Only one sprinklered will activate during a fire. If the fire spreads to another part of the room then the second sprinkler head will activate.
Objectives

- Understand the combustion process and different fire classes
- Understand fire extinguisher types, operating procedures
- Understand basic firefighting concepts
4.1.2.1. Classification
(See Appendix A.)

1) For the purposes of this Part, flammable liquids and combustible liquids shall be classified in conformance with Sentences (2) and (3).

2) Flammable liquids shall be Class I liquids, and shall be subdivided into:
   a) Class IA liquids, which shall include those having a flash point below 22.8°C and a boiling point below 37.8°C,
   b) Class IB liquids, which shall include those having a flash point below 22.8°C and a boiling point at or above 37.8°C, and
   c) Class IC liquids, which shall include those having a flash point at or above 22.8°C and below 37.8°C.

3) Combustible liquids shall be Class II or Class IIIA liquids, and shall be subdivided into:
   a) Class II liquids, which shall include those having a flash point at or above 37.8°C and below 60°C, and
   b) Class IIIA liquids, which shall include those having a flash point at or above 60°C and below 93.3°C (see Appendix A).

Heated Liquids

1) When a liquid having a flash point at or above 37.8°C is being processed, stored, handled or used at a temperature at or above its flash point, it shall be treated as a Class I liquid.
Two functions:

• To control or extinguish a small fire (means a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers) and,

• To protect evacuation routes that a fire may block directly or indirectly with smoke or burning/smoldering materials.
The Combustion Process

- Three components
- Need all three components to start a fire
- Fire extinguishers remove one or more of the components.
Three things must be present at the same time to produce fire:

1. Enough **OXYGEN** to sustain combustion
2. Enough **HEAT** to reach ignition temperature
3. Some **FUEL** or combustible material

Together, they produce the **CHEMICAL REACTION** that is fire

Take away any of these things and the fire will be extinguished
Fires are classified according to the type of fuel that is burning.

If you use the wrong type of fire extinguisher on the wrong class of fire, you might make matters worse.

It's very important to understand the four different fire (fuel) classifications...
Fire Classes

A  Trash   Wood   Paper
  - wood
  - paper
  - cloth
  - etc.

B  Liquids   Grease
  - gasoline
  - oil
  - grease
  - other solvents

C  Electrical Equipment
  - computers
  - fax machine
  - other energized electrical equip.

COMBUSTIBLE
  - magnesium
  - sodium
  - potassium
  - titanium
  - other flammable solids

D  SOLIDS
<table>
<thead>
<tr>
<th>COOKING MEDIA</th>
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</thead>
<tbody>
<tr>
<td>- vegetable oils</td>
</tr>
<tr>
<td>- grease</td>
</tr>
<tr>
<td>- fats &amp; lards</td>
</tr>
</tbody>
</table>
Fire Extinguisher Anatomy

- DISCHARGE LEVER
- DISCHARGE LOCKING PIN AND SEAL
- DISCHARGE HOSE
- DISCHARGE NOZZLE
- DISCHARGE ORIFICE
- BODY
- DATA PLATE
- PRESSURE GAUGE (not found on CO₂ extinguishers)
- CARRYING HANDLE
Fire Extinguisher Types

Pressurized Water

- Class “A” fires only
- 2.5 gal. water *(up to 1 minute discharge time)*
- Has pressure gauge to allow visual capacity check
- 9-12 m. maximum effective range
- Can be started and stopped as necessary
- Extinguishes by *cooling* burning material below the ignition point.
CARBON DIOXIDE (CO$_2$)

- Class “B” or “C” fires
- 2.5-100 lb. of CO$_2$ (8-30 seconds discharge time)
- Has **NO** pressure gauge--capacity verified by weight
- 1-4 m. maximum effective range
- Extinguishes by *smothering* burning materials
- Effectiveness *decreases* as temperature of burning material increases.
Fire Extinguisher Types (cont.)

MULTIPURPOSE DRY CHEMICAL

- Class “A”, “B”, or “C” fires
- 2.5-20 lb. dry chemical \((ammonium phosphate)\)
  \(8-25\) seconds discharge time
- Has pressure gauge to allow visual capacity check
- 1.5-6 m. maximum effective range
- Extinguishes by *smothering* burning materials.
Fire Extinguisher Types (cont.)

**DRY POWDER EXTINGUISHER**

- Class “D” fires
- 30 lb. dry powder (*dry powder 20-25 seconds discharge time*)
- Has pressure gauge to allow visual capacity check
- 3 to 5 m maximum effective range
- Extinguishes by **cooling & smothering** burning materials.
Fire Extinguisher Types (cont.)

Hydrofluorocarbon – FE-36

- Class “A”, “B”, or “C” fires
- 2.5-20 lb. dry chemical (hydrofluorocarbon – “cleanguard 8-25 seconds discharge time”)
- Has pressure gauge to allow visual capacity check
- 1.5-6 m. maximum effective range
- Extinguishes by **cooling & smothering** burning materials.
Class K Fire Extinguishers

- Also carry a class A & B rating
- Class K rating does not carry a number value such as class A & B ratings
<table>
<thead>
<tr>
<th>Extinguisher Type</th>
<th>Works By</th>
<th>Effective Against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressurized Water</td>
<td>Cooling</td>
<td>![A]</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>Smothering</td>
<td>![B] ![C]</td>
</tr>
<tr>
<td>Multipurpose Dry Chemical</td>
<td>Smothering</td>
<td>![A] ![B] ![C]</td>
</tr>
<tr>
<td>Extinguisher Type</td>
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<td>Effective Against</td>
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</tr>
<tr>
<td>Class D Dry Powder</td>
<td>Cooling &amp; Smothering</td>
<td>D</td>
</tr>
<tr>
<td>Hydrofluoro-carbon – “FE-36”</td>
<td>Cooling &amp; Smothering</td>
<td></td>
</tr>
</tbody>
</table>
Fighting the Fire

Pull the pin
Aim low at the base of flames
Squeeze the handle
Sweep side to side
Pull the pin...

This will allow you to discharge the extinguisher.
Aim at the base of the fire...

Hit the fuel.
If you aim at the flames...

... the extinguishing agent will fly right through and do no good.
Squeeze the top handle...

This depresses a button that releases the pressurized extinguishing agent.
How to Use a Fire Extinguisher

**Sweep from side to side...**

.. until the fire is completely out.

Start using the extinguisher from a safe distance away, then slowly move forward.

Once the fire is out, keep an eye on the area in case it re-ignites.
Fire Emergency Response

R - Rescue
A - Alarm
C - Contain
E - Extinguish
Rules for Fighting Fires

Fires can be very dangerous and you should always be certain that you will not endanger yourself or others when attempting to put out a fire.

For this reason, when a fire is discovered...

1. Assist any person in immediate danger to safety, if it can be accomplished without risk to yourself.

2. Activate the building fire alarm system with the fire alarm pull station and call 403-220-533. The fire alarm will notify the fire department and other building occupants and shut off the air handling system to prevent the spread of smoke.

If the fire is small (and Only after having done these 2 things), you may attempt to use an extinguisher to put it out. **However**...
. . . before deciding to fight the fire, keep these things in mind:

1. **Know what is burning.** If you don’t know what’s burning, you won’t know what kind of extinguisher to use.

2. Even if you have an ABC fire extinguisher, there may be something in the fire that is going to explode or produce toxic fumes.

Chances are you will know what’s burning, or at least have a pretty good idea, but if you don’t, let the fire department handle it.
. . . before deciding to fight the fire, keep these things in mind:

3. **Is the fire spreading** rapidly beyond the point where it started? The time to use an extinguisher is at the beginning stages of the fire.

4. If the fire is already spreading quickly, it is best to simply evacuate the building.

As you evacuate a building, close doors and windows behind you as you leave. This will help to slow the spread of smoke and fire.
Do not fight the fire if:

✓ You don’t have adequate or appropriate equipment. If you don’t have the correct type or large enough extinguisher, it is best not to try fighting the fire.

✓ You might inhale toxic smoke. When synthetic materials such as the nylon in carpeting or foam padding in a sofa burn, they can produce hydrogen cyanide, acrolein, and ammonia in addition to carbon monoxide. These gases can be fatal in very small amounts.

✓ Your instincts tell you not to. If you are uncomfortable with the situation for any reason, just let the fire department do their job.
The final rule is to always position yourself with an exit or means of escape at your back before you attempt to use an extinguisher to put out a fire.

In case the extinguisher malfunctions, or something unexpected happens, you need to be able to get out quickly. You don’t want to become trapped.
Firefighting Decision Criteria

- **Know** department emergency procedures and evacuation routes
- **Know** locations of extinguishers in your area and how to use them
- **Always** sound the alarm **regardless** of fire size
- **Avoid** smoky conditions
- **Ensure** area is evacuated
- **Don’t** attempt to fight unless:
  - Alarm is sounded
  - Fire is **small** and **contained**
  - You have safe egress route (can be reached **without** exposure to fire)
  - Available extinguishers are rated for size and type of fire
- If in doubt, **“EVACUATE” “DONOT HESITATE”**
- **“DON’T ATTEMPT TO FIGHT UNLESS YOU ARE TRAINED”**
Summary

- Combustion Process (*Fire Triangle*)
- Class A, B, C, D, K fires
- Types of portable fire extinguishers:
  - Operating procedures
  - Capabilities and limitations
- Basic firefighting concepts: **R.A.C.E.**
  **P.A.S.S.**
Campus Security:
Phone: 403-220-5333
Email: campus.security@ucalgary.ca

Emergency Management:
Sandy Mackenzie
Emergency Warden Program Coordinator
Email: emergencymgmt@ucalgary.ca
Email: sandy.mackenzie@ucalgary.ca
We are excited to announce that UC Emergency is now available in app stores for Android, Blackberry and iOS devices.

Please visit www.ucalgary.ca/emergencyapp for more information.

The UC Emergency app delivers alerts and updates that can save lives and prevent injury. The app is one part of the university's emergency management plan and a big part of creating a safe and healthy living and learning environment for everyone on campus.