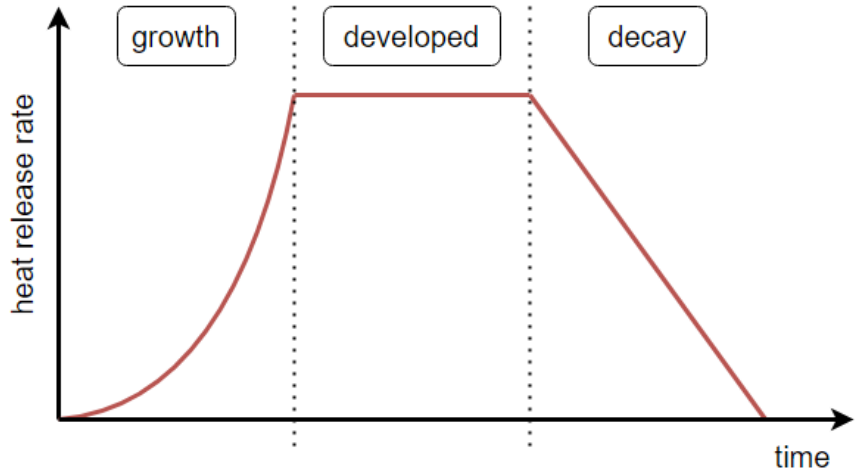
COMPARTMENT FIRE

A compartment fire refers to a fire that occurs within an enclosed space or compartment, such as a room, corridor, or any confined area with defined boundaries.

DEVELOPMENT OF COMPARTMENT FIRES

The development of compartment fires can be broken down into three phases

1. Pre-flashover (also known as the growth period);
2. Post-flashover (fully developed fire) and
3. The decay period



1. Pre-flashover period:

The pre-flashover period refers to the initial phase of a fire within a compartment where combustion is localized to small areas. During this phase, the fire is contained and does not spread extensively. While there is combustion occurring, the overall or average rise in temperature within the compartment remains relatively small. This is because the fire is confined to limited fuel sources and the heat generated is not enough to cause widespread temperature increases throughout the entire compartment.

2. Post-flashover period

In this period, the rate of temperature rise throughout the compartment is high and reaches peak. In compartment fires, maximum temperatures of over 1000◦C are possible. Once the rate of temperature rise reaches its peak and fuel availability diminishes, the fire enters its decay phase.

3. Decay phase

In this phase, the temperature in the compartment now starts to decrease as the rate of fuel combustion decreases. The temperature in the structure will continue to increase for a short while in the decay period, i.e. there will be a time lag before the structure starts to cool.

Compartment fires play a crucial role in fire safety engineering, particularly in understanding fire behavior within enclosed spaces.