

Fuel Controlled Fire Development:

When sufficient oxygen is available, fire development is controlled by the characteristics and configuration of the fuel.

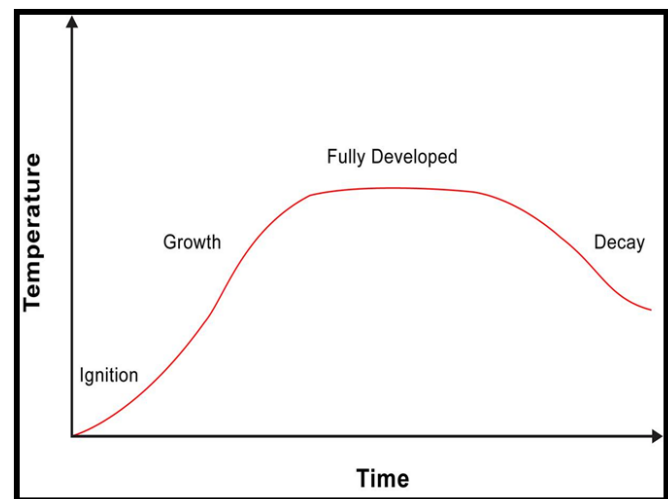
Fire Development Stages

Ignition/Incipient: The incipient stage starts with ignition; ignition describes the point when the three elements of the fire triangle come together and combustion occurs.

Growth: If there is adequate oxygen additional fuels will become involved and the heat release rate from the fire will increase.

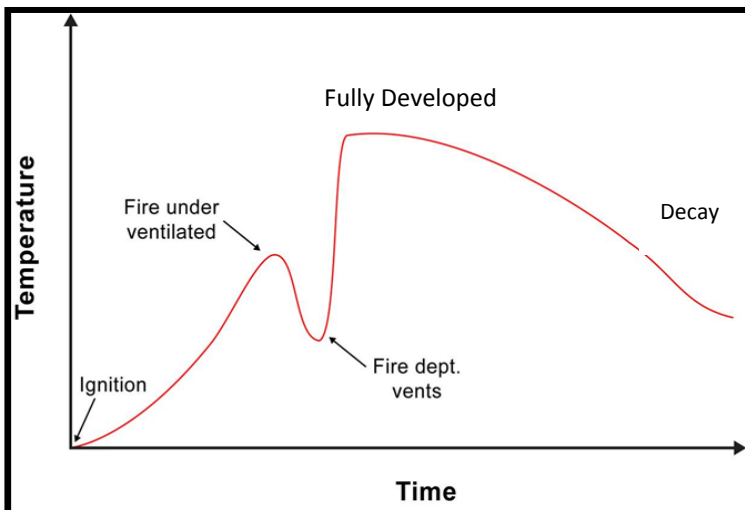
Fully Developed: The fully developed stage occurs when all combustible materials in the compartment are burning.

Decay: Fire Growth will decay as the fuel is consumed or the oxygen concentration falls to the point where flaming combustion can no longer be supported.



Ventilation Controlled Fire Development:

When fire development is limited by the air supply.



Fire Behavior in a Structure

The Fire Behavior in a Structure curve demonstrates the time history of a ventilation limited fire. In this case the fire starts in a structure which has the doors and windows closed. Early in the fire growth stage there is adequate oxygen to mix with the heated gases, which results in flaming combustion. As the oxygen level within the structure is depleted, the fire decays, the heat release from the fire decreases and as a result the temperature decreases. When a vent is opened, such as when the fire department enters a door, oxygen is introduced. The oxygen mixes with the heated gases in the structure and the energy level begins to increase. This change in ventilation can result in a rapid increase in fire growth potentially leading to a flashover (fully developed compartment fire) condition.