Homeland Security

Improvised Explosive Device (IED)

There are four required components of an improvised explosive device: a power source, an initiator, an explosive (main charge), and a switch. These components can be remembered with the acronym, "PIES." If any one of these components is missing the device will not function.

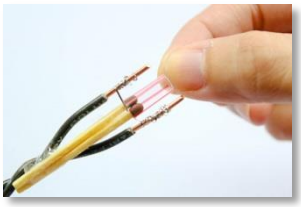
Power Source

Photos: DHS/OBP Picture Library

A **power source** is a device that either stores or releases electrical, mechanical or chemical energy to initiate an IED.

Not all IEDs require batteries. IEDs just need some energy input to get the process started and that energy can take many forms. Physical, thermal, and mechanical energy are also power sources. For example, a spring under tension produces mechanical energy.

Initiator

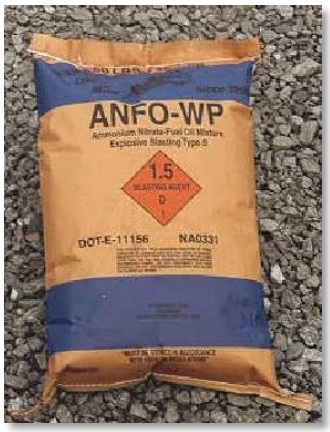


Photos: DHS/OBP Picture Library

An **initiator** is the first explosive in the explosive train of an IED. Once a source of energy is put into the system an initiator is required to start the actual explosive event. An initiator usually uses a small quantity of sensitive explosives. It provides a strong but small explosion to set off the larger quantity of explosives identified as the "main charge." It is the energy release associated with the main charge and not the initiator that causes most of the damage from an IED.

Military and commercial initiators are widely available and include a variety of mechanical or electrical devices.

Explosive/Main Charge



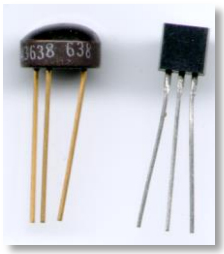
Photos: DHS/OBP Picture Library

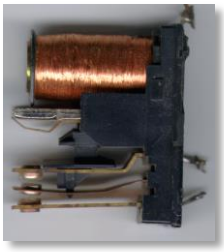
The **main charge** consists of some sort of filler made up either of explosive or combustible material. The term **explosive** is used in this course to denote the main charge.

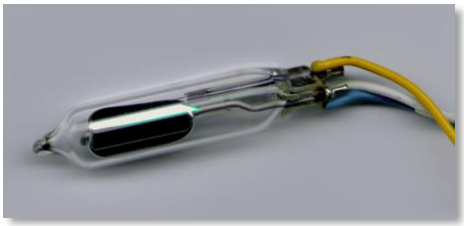
Main charges can be characterized either as manufactured explosives, which include commercially available and military explosives, or homemade explosives (HME). Commercial and military explosives are regulated and controlled, and more difficult to obtain. Their chemical properties are standardized, therefore their explosive properties are known.

Homemade explosives (HME) are created using a combination of commercially available ingredients. Because the ingredients can be acquired more readily, HME are the preferred option for terrorists. Because they are manufactured under less controlled conditions, and often use adulterated or less pure ingredients, HME are less predictable and often unstable.

Switch

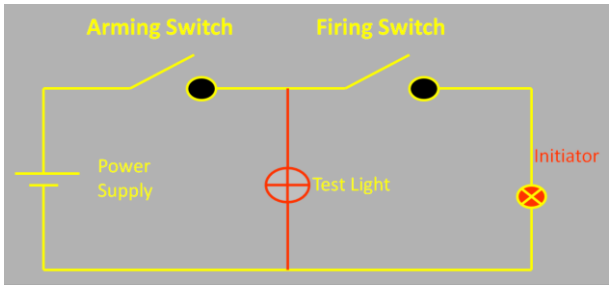






Photos: DHS/OBP Picture Library

Switches are used for the arming and firing sequences of the IED. They enable the process that allows the energy from the power source to be applied to the initiator; essentially what causes the IED to function.
To create safeguards for the bomber, multiple switches can act as either arming or firing circuits in the IED.



This is just a very small sample of the many types of switches that could be used in an IED.