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By: Gabriel Gache, Science News Editor



US military employee rigging up a C-4 explosive charge
US Navy

What is C-4?

Plastic explosives

Composition 4, or more commonly known as C-4, is a plastic explosive widely used in civil and military applications, which gained popularity as being extremely stable and due to publicity through films and video games. The term 'Composition' is associated to stable explosives, for example, Composition A, Composition B and so on. It basically consists of a series of explosives bonded together with a plastic binder and a chemical, usually 2,3-dimethyl-2,3-dinitrobutane, to identify the type and source of explosive. The explosive material, cyclotrimethylene-trinitramine or C-4, also known as Royal Demolition Explosive and Research Development Explosive - RDX - is coated by the binding material in order to make it more stable to shocks and heat, fact which also gives it high malleability. The RDX material makes up 91 percent of the C-4 weight, while the plastic binder and plasticizer makes up only 7.4 percent of the volume of explosive. The other 5 percent is represented by supplemental plasticizers, motor oil and chemical marker. The explosion reaction is only initiated with detonators of blasting caps, setting it on fire or shooting it with a hand pistol or rifle wouldn't work, due to the remarkable properties of the stabilizing elements. In fact, C-4 is so stable that during the Vietnam war US soldiers would light it on fire and use it much in the same way as a piece of wood. C-4 has a explosive force 1.34 time that of trinitrotoluene - TNT - and can produce a pressure wave traveling at 8,040 meters per second. The explosive reaction takes place in two stages. The first explosion creates a low-pressure wave in the surrounding area, although producing most of the damage. As the gas expands rapidly in the surrounding area, it creates a temporary vacuum in the middle which determines a high-pressure implosion. The biggest advantage of C-4 except for being highly stable, is that its malleability enables it to be molded basically in any shape, may be pressed in gaps, cracks or inserted in any type of case. In military terms C-4 is also referred to as PE4 or T4, depending on the type of plasticizer used for the explosive mix. C-4 appears as a white colored solid, very malleable on touch, and is generally used for military demolition, as explosive for bombs, hand grenades or home made bombs. In the last decades or so, C-4 became the preferred explosive for guerilla fighters and terrorists due to its accessibility, stability and high explosive power.