

Military Explosives
Part One

Definitions

Military Demolition:

Military demolition is the destruction by fire, water, explosive, mechanical, or other means of area structures, facilities, or materials to accomplish a military objective. Demolitions are explosives used for such purposes. Demolitions have offensive and defensive uses. Examples are the removal of enemy barriers to facilitate the advance and the construction of friendly barriers to delay or restrict enemy movement.

Explosives:

Explosives are substances that, through chemical reaction, violently change to a gaseous form. In doing so, they release pressure and heat equally in all directions. They are classified as low or high according to the detonating velocity or speed (in meters or feet per second) at which this change takes place and other characteristics such as their shattering effect.

Low Explosives:

Low explosives change from a solid to a gaseous state slowly over a sustained period (up to 400 meters or 1,300 feet per second). This characteristic makes low explosives ideal when a pushing or shoving effect is required. Examples of low explosives are smokeless and black powders.

High Explosives:

High explosives change to a gaseous state almost instantaneously at 1,000 meters per second (3,280 feet per second) to 8,500 meters per second (27,888 feet per second), producing a shattering effect on the target. Use high explosives when a shattering effect, or brisance, is required.

Relative Effectiveness (RE) Factor:

Explosives vary in detonating rate or velocity (meters or feet per second), as well as other characteristics, such as density and energy production. These characteristics determine their effectiveness for cutting, breaching, or cratering charges. Most military demolitions involve cutting or breaching. The amount of explosive used is adjusted by a relative effectiveness (RE) factor, which is based upon the shattering effect of the explosive in relation to that of trinitrotoluene (TNT). The shattering effect of a high explosive is related to its detonating velocity. For example, TNT with a detonating velocity of 6,900 meters per second has a relative effectiveness factor of 1.00, while Composition C4 with a detonating velocity of 8,040 meters per second has a relative effectiveness factor of 1.34.

Cratering Effect:

The cratering effect of high explosives depends upon their total energy

MILTEXPL.TXT

content, which determines the amount of energy available to throw the broken material from the crater. Because a shattering effect is not required to form a crater, low-velocity explosives are generally more effective for cratering purposes. Therefore, the relative effectiveness factor is not considered in determining the effect of a cratering charge. Blasting road craters or ditches normally requires large amounts of explosives. Because it is effective and inexpensive, an ammonium nitrate-based cratering charge is used as a standard cratering charge.

Characteristics

To be suitable for use in military operations, explosives must have certain properties. Military explosives must -- Be inexpensive to manufacture and capable of being produced from readily available raw material. Be relatively insensitive to shock or friction, yet able to positively detonate by easily prepared initiators. Have the shattering effect and potential energy adequate for the purpose. Be stable enough to retain usefulness for a reasonable time when stored in any climate at temperatures between -80 and +165 degrees Fahrenheit. Have high density (weight per unit of volume). Be suitable for use under water or in damp climates. Have minimum toxicity (poisonous effects) when stored, handled, and detonated. Be a convenient size and shape for packaging, storing, distributing, handling, and emplacing by troops. Have high energy output per unit of volume.

Detonation

The detonation or burning of all explosives produces poisonous fumes. The chemicals used in explosives are poisonous. Caution personnel against inhaling fumes or ingesting explosives. When explosives are used in closed areas or underground, allow adequate time for the fumes to dissipate before investigation. Control the explosives to prevent their use, such as burning as a source of heat or cooking, for other than intended purpose.

Fire Hazards

Explosives contain their own oxidizer. Burning explosives cannot be extinguished by smothering or with water. In fact, smothering will probably cause an explosion. Because of the possibility of detonation while explosives are burning, observe the minimum safe distance. WARNING: Personnel should not attempt to extinguish burning explosives without expert advice and assistance.

Fire Safety Precautions for Transport

MILTEXPL.TXT

If fire breaks out in a vehicle transporting explosives, try to stop the vehicle away from any populated buildings. Stop traffic in both directions, and warn drivers, passengers, and occupants of nearby buildings to keep at least 2,000 feet away. Inform police and firefighting authorities that the cargo is explosives. If a fire involves only the engine, cab, chassis, or tires, make an effort to put out the fire with fire extinguishers, sand, dirt, or water. If the fire spreads to the body or cargo, STOP FIGHTING THE FIRE AND EVACUATE THE AREA to a distance of at least 2,000 feet.

DOWNLOADED FROM P-80 SYSTEMS.....