

THE BLASTER'S GUIDE

A Resource for the
Explosives and Blasting Industry



Legal Disclaimer: This guide is intended for use by qualified engineers, experienced in explosives blast design and execution. Substantial training regarding the functionality and limitations of this software is required to use this software properly. This guide cannot account for all field conditions. Professional judgement must be exercised by the engineers using this guide and executing the field work.

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IME Glossary

The complete IME Glossary of Commercial Explosives Industry Terms. This information is the copyrighted intellectual property of the Institute of Makers of Explosives (IME) and is reprinted herein with the express permission of IME.

Words used in the singular shall include the plural and in the plural shall include the singular.





AC Alternating current.

ACCEPTOR A charge of explosives or blasting agent receiving an impulse from an exploding donor charge.

ADOBE CHARGE A mud covered or unconfined charge fired in contact with a rock surface without the use of a borehole. Synonymous with BULLDOZE, MUDCAPPING, and PLASTER.

AIRBLAST The airborne shock wave or acoustic transient generated by an explosion.

"ALWAYS AND NEVER" List of precautions (IME Safety Library Publication No. 4) printed by the Institute of Makers of Explosives pertaining to the transportation, storage, handling and use of explosive materials. Formerly titled "DO'S AND DON'TS".

AMERICAN TABLE OF DISTANCES A quantity distance table, prepared and approved by IME, for storage of explosive materials to determine safe distances from inhabited buildings, public highways, passenger railways, and other stored explosive materials.

AMMONIUM NITRATE The ammonium salt of nitric acid represented by the formula NH_4NO_3 .

AMPERE A unit of electrical current produced by 1 volt acting through a resistance of 1 ohm.

ANFO An explosive material consisting of ammonium nitrate and fuel oil. Synonymous with prills and oil.

ANSI American National Standards Institute - a nongovernmental organization concerned with developing safety and health standards for industry.

APPROPRIATE AUTHORITY See COMPETENT AUTHORITY.

APPROVED, APPROVAL, OR AUTHORIZED Terms which mean APPROVED, APPROVAL, or AUTHORIZED by the authority having jurisdiction.

ARTIFICIAL BARRICADE An artificial mound or revetted wall of earth of minimum thickness of three feet.

AUTHORIZED PERSON An individual approved or assigned by management to perform a specific duty or duties or to be at a specific location or locations.

AUTHORITY HAVING JURISDICTION The governmental agency, office, or individual responsible for approving equipment, an installation, or a procedure.

AVAILABLE ENERGY The energy from an explosive material that is capable of performing useful work.

BACKBREAK Rock broken beyond the limits of the last row of holes in a blast. Synonymous with OVERBREAK.

BALLISTIC MORTAR A laboratory instrument used for measuring the relative power or strength of an explosive material.

BARRICADED The effective screening of a building containing explosive materials from a magazine or other building, railway, or highway by a natural or an artificial barrier. A straight line from the top of any sidewall of the building containing explosive materials to the eave line of any magazine or other building or to a point twelve feet above the center of a railway or highway shall pass through such barrier.

BASE CHARGE The main explosive charge in the base of a detonator.

BATF See BUREAU OF ALCOHOL, TOBACCO AND FIREARMS.

BENCH A horizontal ledge from which holes are drilled vertically down into the material to be blasted: benching is a process of excavating where a highwall is worked in steps or lifts.

BENCH HEIGHT The vertical distance from the top of a bench to the floor or to the top of the next lower bench.

BLACK POWDER A deflagrating or low explosive compound of an intimate mixture of sulfur, charcoal, and an alkali nitrate, usually potassium or sodium nitrate.

BLAST, (BLASTING) The firing of explosive materials for such purposes as breaking rock or other material, moving material, or generating seismic waves.

BLAST AREA The area of a blast within the influence of flying rock missiles, gases, and concussion.

BLASTHOLE See DRILL HOLE and BOREHOLE.



BLAST PATTERN The plan of the drill holes as laid out for blasting: an expression of the burden distance and the spacing distance and their relationship to each other. Synonymous with DRILL PATTERN.

BLAST PATTERN The area where explosive material is handled during loading, including the perimeter of blast holes and 50 feet in all directions from loaded holes and contiguous holes that are to be loaded on the present shift. In underground mines, 15 feet of solid rib or pillar can be substituted for the 50 foot distance.

BLASTER That qualified person in charge of, and responsible for, the loading and firing of a blast. Synonymous with SHOT FIRER.

BLASTING ACCESSORIES Non-explosive devices and materials used in blasting, such as, but not limited to, cap crimpers, tamping bags, blasting machines, blasting galvanometers, and cartridge punches.

BLASTING AGENT An explosive material which meets prescribed criteria for insensitivity to initiation. For storage, Title 27, Code of Federal Regulations, Section 55.11 defines a blasting agent as any material or mixture consisting of a fuel and oxidizer, intended for blasting, not otherwise defined as an explosive, provided that the finished product, as mixed for use or shipment, cannot be detonated by means of a No. 8 test blasting cap when unconfined. (Bureau of Alcohol, Tobacco and Firearms Regulation). For transportation, Title 49 Code of Federal Regulations defines a blasting agent as a material designed for blasting which has been tested in accordance with Section 173.114a and found to be so insensitive that there is very little probability of accidental initiation to explosion or transition from deflagration to detonation (US Department of Transportation Regulation).

BLASTING CAP A detonator which is initiated with a safety fuse. Synonymous with FUSE CAP, also see DETONATOR.

BLASTING CREW A group of persons who assist the blaster in loading, tying-in, and firing a blast.

BLASTING GALVANOMETER An electrical resistance instrument designed specifically for testing electric detonators and circuits containing them. It is used to check electrical continuity. Other acceptable instruments for this purpose are Blasting Ohmmeters and Blasters' Multimeters.

BLASTING LOG A written record of information about a specific blast as may be required by law or regulation.

BLASTING MACHINE An electrical or electromechanical device which provides electrical energy for the purpose of energizing detonators in an electric blasting circuit. Also used in reference to certain nonelectric systems. (Sometimes called exploder or battery.)

BLASTING MACHINE - CD TYPE See CAPACITOR DISCHARGE BLASTING MACHINE.

BLASTING MACHINE - GENERATOR TYPE A hand operated electromechanical device which provides an output current to energize electric detonators.

BLASTING MACHINE - RHEOSTAT A graduated electrical resistance device used to simulate electric detonator resistances for the testing of generator type blasting machines.

BLASTING MAT A mat of woven steel wire, rope, scrap tires, or other suitable material or construction to cover blastholes for the purpose of preventing flying rock missiles.

BLASTING VIBRATIONS The energy from a blast that manifests itself in vibrations which are transmitted through the earth away from the immediate blast area.

BLOCKHOLING The breaking of boulders by loading and firing small explosive charges in small-diameter drilled holes.

BOOSTER An explosive charge, usually of high detonation velocity and detonation pressure, designed to be used in the explosive initiation sequence between an initiator or primer and the main charge.

BOOTLEG The part of a drilled blasthole that remains when the force of the explosion does not break the rock completely to the bottom of the hole. Synonymous with SOCKET.

BOREHOLE A hole drilled in the material to be blasted, for the purpose of containing an explosive charge, also called BLASTHOLE or DRILL HOLE.

BREAKAGE A term used to describe the size distribution of the rock fragments created by a blast.



BRIDGEWIRE A resistance wire connecting the ends of the leg wires inside an electric detonator and which is imbedded in the ignition charge of the detonator.

BRISANCE The shattering power of an explosive material as distinguished from its total work capacity.

BULK MIX A mass of explosive material prepared for use in bulk form without packaging.

BULK MIX DELIVERY EQUIPMENT Equipment (usually a motor vehicle with or without a mechanical delivery device) that transports explosive materials in bulk form for mixing or loading directly into blastholes, or both.

BULK STRENGTH The strength per unit volume of an explosive calculated from its weight strength and density.

BULLDOZE See ADOBE CHARGE. Synonymous with MUDCAPPING and PLASTER.

BULLET-RESISTANT Magazine walls or doors of construction resistant to penetration of a bullet of 150 grain M2 ball ammunition having a nominal muzzle velocity of 2700 feet per second fired from a .30 caliber rifle from a distance of 100 feet perpendicular to the wall or door. When a magazine ceiling or roof is required to be bullet-resistant, the ceiling or roof shall be constructed of materials comparable to the side walls or of other materials which will withstand penetration of the bullet described above when fired at an angle of 45 degrees from the perpendicular. Tests to determine bullet resistance shall be conducted on test panels or empty magazines which shall resist penetration of 5 out of 5 shots placed independently of each other in an area at least 3 feet by 3 feet.

BULLET-SENSITIVE EXPLOSIVE MATERIAL Explosive materials that can be detonated by 150 grain M2 ball ammunition having a nominal muzzle velocity of 2700 feet per second fired when the bullet is fired from a .30 caliber rifle from a distance of 100 feet and the test material, at a temperature of 70 to 75oF, is placed against a blacking material of 1/2-inch steel plate.

BUREAU OF EXPLOSIVES A bureau of the Association of American Railroads which the U.S. Department of Transportation may consult for recommendations on classification of explosive materials for the purpose of interstate transportation.

BURDEN The distance from the borehole and the nearest free face or the distance between boreholes measured perpendicular to the spacing. Also, the total amount of material to be blasted by a given hole, usually measured in cubic yards or tons.

BUREAU OF ALCOHOL, TOBACCO, AND FIREARMS (BATF) A bureau of the Department of Treasury having responsibility for the promulgation and enforcement of regulations related to the unlawful use of explosive materials under 18 U.S.C. Chapter 40, Section 847.

BUREAU OF MINES See U.S. BUREAU OF MINES.

BUS WIRE Expendable heavy gage bare copper wire used to connect detonators or series of detonators in parallel.

CAP CRIMPER A mechanical device for crimping the metallic shell of a fuse detonator or igniter cord connector securely to a section of inserted safety fuse. May be a hand or bench tool.

CAP SENSITIVE EXPLOSIVE MATERIAL An explosive material which will detonate with an IME No. 8 TEST DETONATOR when the material is unconfined.

CAPACITOR- DISCHARGE BLASTING MACHINE A blasting machine in which electrical energy, stored on a capacitor, is discharged into a blasting circuit containing electric detonators.

CARTON A lightweight inner container for explosive materials, usually encased in a substantial shipping container called a case.

CARTRIDGE An individual closed shell, bag, or tube of circular cross section containing explosive material.

CARTRIDGE COUNT (STICK COUNT) The number of cartridges in a standard case. A standard case typically contains about 50 pounds of explosive material.

CARTRIDGE PUNCH A wooden, plastic, or non-sparking metallic device used to punch an opening in an explosive to accept a detonator or a section of detonating cord. Synonymous with POWDER PUNCH.

CARTRIDGE STRENGTH Synonymous with BULK STRENGTH.



CASE An outer substantial shipping container meeting DOT specifications for explosive materials.

CASE INSERT A set of printed, precautionary instructions, including the IME "Instructions and Warnings" which is included in a case of explosive materials.

CASE LINER A separate barrier inside a shipping case, used to prevent the escape of explosive materials. A liner may also restrict fumes from escaping from the case and protect the explosive materials from moisture.

CAST, EXTRUDED, OR PRESSED BOOSTER A cast, extruded or pressed solid high explosive. (See BOOSTER)

CERTIFIED BLASTER A blaster certified by a governmental agency to prepare, execute, and supervise blasting.

CFM An abbreviation for cubic feet per minute, a measure of the volume of flow. Usually refers to air flow in mining usage.

CHEMICAL MANUFACTURERS ASSOCIATION (CMA) A non-profit chemical trade organization of companies in the U.S. and Canada who manufacture chemicals for sale.

CIRCUIT A completed path for conveying electrical current. See series circuit, parallel circuit, and series in parallel circuit. (Some nonelectric systems also use the word circuit.)

CLASS A EXPLOSIVES Explosives, as defined by the U.S. Department of Transportation, which possess detonating or otherwise maximum hazard; such as, but not limited to, dynamite, nitroglycerin, lead azide, blasting caps and detonating primers.

CLASS B EXPLOSIVES Explosives, as defined by the U.S. Department of Transportation, which possess flammable hazards; such as, but not limited to, propellant explosives, photographic flash powders, and some special fireworks.

CLASS C EXPLOSIVES Explosives, as defined by the U.S. Department of Transportation, which contain Class A or Class B explosives, or both, as components but in restricted quantities.

COLLAR The mouth or opening of a borehole or shaft.

COLUMN CHARGE A charge of explosives in a blasthole in the form of a long continuous unbroken column.

COLUMN DEPTH/ COLUMN HEIGHT The length of each portion of a blasthole filled with explosive materials.

COMMERCIAL EXPLOSIVES Explosives designed, produced, and used for commercial or industrial applications rather than for military purposes.

COMPETENT AUTHORITY A national agency responsible under its national law for the control or regulation of a particular aspect of the transportation of hazardous materials. Also referred to as APPROPRIATE AUTHORITY (Ref. 49 CFR).

CONFINED DETONATION VELOCITY The detonation velocity of an explosive material in a substantial container or a borehole.

CONNECTING WIRE Wire used to extend the firing line or leg wires in an electric blasting circuit.

CONTINUITY CHECK (CIRCUIT CONTINUITY CHECK) a determination made by instrumentation where possible, and visually in all cases, to show that an initiation system is continuous and contains no breaks or improper connections that could cause stoppage or failure of the initiation process.

CONTOUR BLASTING A blasting technique used to produce smooth walls and reduce overbreak in underground blasting. The cushion holes have light, well distributed charges and are fired on the last delay period in the round.

CORE LOAD The explosive core of detonating cord, expressed as the weight in grains of explosive per foot.

COUPLING The degree to which an explosive fills the cross-section of a borehole; bulk-loaded explosives are completely coupled; untamped cartridges are decoupled.

COYOTE SHOOTING A method of blasting using a number of relatively large concentrated charges of explosives placed in one or more small tunnels driven in a rock formation.

CRIMP The folded ends of paper explosive cartridges; the circumferential depression at the open end of a fuse cap or igniter cord connector which serves to secure the fuse; or the circumferential depression in the blasting cap shell that secures a sealing plug or sleeve into electric or nonelectric detonators.

CRIMPING The act of securing a fuse cap or igniter cord connector to a section of a safety fuse by compressing the metal shell of the cap against the fuse by means of a cap crimper.

CRITICAL DIAMETER The minimum diameter for propagation of a detonation wave at a stable velocity. Critical diameter is affected by conditions of confinement, temperature and pressure on the explosive.

CURRENT LEAKAGE Portion of the firing current bypassing part of the blasting circuit through unintended paths.

CURRENT LIMITING DEVICE An electric or electromechanical device that limits (1) current amplitude; (2) duration of current flow; or (3) total energy of the current delivered to an electric blasting circuit.

CUSHION BLASTING A blasting technique used to produce competent slopes or smooth walls. The cushion holes, fired after the main charge, have a reduced spacing and employ decoupled charges.

CUTOFF A break in a path of detonation or initiation caused by extraneous interference, such as flyrock or shifting ground.

DATE-SHIFT CODE A code, required by Federal regulation (BATF), applied by manufacturers to the outside shipping containers, and, in many instances, to the immediate containers of explosive materials to aid in their identification and tracing.

D'AUTRICHE METHOD- DETONATION VELOCITY A method of determining the detonation velocity of an explosive material by employing detonating cord and a witness plate.

DC Direct current.

DECIBEL A unit of air overpressure commonly used to measure air blast.

DECK LOADING (DECKING) A method of loading blastholes in which the explosive charges, called decks or deck charges, in the same hole are separated by stemming or an air cushion.

DECK An explosive charge that is separated from other charges in the blasthole by stemming or an air cushion.

DECOUPLING The use of cartridge explosive products significantly smaller in diameter than the diameter of the blasthole. Decoupling or the use of decoupling charges is designed to reduce the charge concentration in the blasthole and minimize stresses exerted on the walls of the blasthole.

DEFLAGRATION An explosive reaction such as a rapid combustion that moves through an explosive material at a velocity less than the speed of sound in the material.

DELAY A distinct pause of predetermined time between detonation or initiation impulses, to permit the firing of explosive charges separately.

DELAY BLASTING The practice of initiating individual explosive decks, boreholes or rows of boreholes at predetermined time intervals using delay detonators, or other delaying means, as compared to instantaneous blasting where all holes are fired essentially at the same time.

DELAY DETONATOR An electric or nonelectric detonator used to introduce a predetermine lapse of time between the application of a firing signal and the detonation of the base charge.

DELAY ELEMENT The device in a delay detonator that produces the predetermined time lapse between the application of a firing signal and detonation.

DELAY INTERVAL The nominal time between the detonations of delay detonators of adjacent periods in a delay series; the nominal time between successive detonations in a blast.

DELAY PERIOD A designation given to a delay detonator to show its relative or absolute delay time in a given series.

DELAY SERIES A series of delay detonators designed to satisfy specific blasting requirements. There are basically two types of delay series: millisecond (MS) or short period (SP) with delay intervals on the order of milliseconds and long period (LP) with delay time on the order of seconds.

DELAY TAG A tag, band, or marker on a delay detonator that denotes the delay series, delay period and/or delay time of the detonator.

DELAY TIME The lapse of time between the application of a firing signal and the detonation of the base charge of a delay detonator.

DENSITY The mass of an explosive per unit volume, usually expressed in grams per cubic centimeter or pounds per foot. (Also see SPECIFIC GRAVITY).

DEPARTMENT OF TRANSPORTATION (DOT) A cabinet-level agency of the Federal Government. It has the responsibility for the comprehensive regulation of transportation safety and issues regulations governing interstate shipments of explosives and other hazardous materials.



DETONATING CORD A flexible cord containing a center core of high explosive which may be used to initiate other high explosives.

DETONATING CORD DOWNLINE the section of detonating cord that extends within the blasthole from the ground surface down to the explosive charge.

DETONATING CORD MS CONNECTORS Nonelectric short-interval (millisecond) delay devices for use in delaying blasts which are initiated by detonating cord.

DETONATING CORD TRUNKLINE The line of detonating cord that is used to connect and initiate other lines of detonating cord.

DETONATING PRIMER A name applied for transportation purposes to a device consisting of a detonator and an additional charge of explosives, assembled as a unit.

DETONATION An explosive reaction that moves through an explosive material at a velocity greater than the speed of sound in the material.

DETONATION PRESSURE The pressure produced in the reaction zone of a detonating explosive.

DETONATING VELOCITY The velocity at which detonation progresses through an explosive.

DETONATOR Any device containing an initiating or primary explosive that is used for initiating detonation in another explosive material. A detonator may not contain more than 10 grams of total explosives by weight, excluding ignition or delay charges. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord delay connectors, and nonelectric instantaneous and delay blasting caps which use detonating cord, shock tube, or any other replacement for electric leg wires. Unless specifically classified otherwise, detonators are Class A Explosives.

DETONATORS, CLASS C EXPLOSIVE Initiating devices which will not mass detonate when packaged for shipment. (See MASS DETONATE)

DIAMETER The cross-sectional width of a borehole or an explosive cartridge.

DITCH BLASTING The formation of a ditch by the detonation of a series of explosive charges.

DITCHING DYNAMITE A nitroglycerin type explosive especially designed to propagate sympathetically from hole to hole in ditch blasting.

DONOR An exploding charge producing an impulse that impinges upon and explosive "acceptor" charge.

DOPE Individual, dry, nonexplosive ingredients that comprise a portion of an explosive formulation.

DO'S AND DON'TS Former name of a list of precautions (IME Safety Library Publication No. 4) printed by the Institute of Makers of Explosives pertaining to the transportation, storage, handling and use of explosive materials and included in cases of explosive materials. Recently renamed, "ALWAYS AND NEVER".

DOWNLINE A line of detonating cord or plastic tubing in a blasthole which transmits the detonation from the trunkline or surface delay system down the hole to the primer.

DRILL HOLE A hole drilled in the material to be blasted for the purpose of containing an explosive charge, also called BLASTHOLE or BOREHOLE.

DRILLING PATTERN The location of blastholes in relationship to each other and the free face.

DUMMY A cylindrical unit of clay, sand, or other inert material used to confine or separate explosive charges in a borehole.

DYNAMITE A high explosive used for blasting, consisting essentially of a mixture of, but not limited to, nitroglycerin, nitrocellulose, ammonium nitrate, sodium nitrate, and carbonaceous materials.

ELECTRIC BLASTING CIRCUIT An electric circuit containing electric detonators and associated wiring. Also see PARALLEL SERIES, and SERIES IN PARALLEL BLASTING CIRCUITS.

ELECTRIC DETONATOR A detonator designed for, and capable of, initiation by means of an electric current.

ELECTRICAL STORM An atmospheric disturbance characterized by intense electrical activity producing lightning strokes and strong electric and magnetic field. Synonymous with THUNDERSTORM and LIGHTNING STORM.

EMERGENCY PROCEDURE CARD Instructions carried on a vehicle transporting explosive materials and giving specific procedures in case of emergency.



EMULSION An explosive material containing substantial amounts of oxidizer dissolved in water droplets, surrounded by an immiscible fuel, or droplets of an immiscible fuel surrounded by water containing substantial amounts of oxidizer.

ENERGY A measure of the potential for an explosive to do work.

EXPLOSION A chemical reaction involving an extremely rapid expansion of gases usually associated with the liberation of heat.

EXPLOSIVE Any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion.

EXPLOSIVE- ACTUATED DEVICE Any tool or special mechanized device which is actuated by explosives. The term does not include propellant-actuated devices. (Also see PROPELLANT-ACTUATED POWER DEVICE.) Examples of explosive-actuated devices are jet-tappers and jet perforators.

EXPLOSIVE CHARGE The quantity of explosive material used in a blasthole, coyote tunnel, or explosive device.

EXPLOSIVE LOADING FACTOR The amount of explosive used per unit of rock. Also called POWDER FACTOR.

EXPLOSIVE MATERIALS These include explosives, blasting agents and detonators. The term includes, but is not limited to, dynamite and other high explosives, slurries, emulsions, and water gels; black powder and pellet powder; initiating explosives; detonators (blasting caps); safety fuse; squibs; detonating cord; igniter cord; and igniters. A list of explosive materials determined to be within the coverage of 18 USC Chapter 40, "Importation, Manufacturer, Distribution, and Storage of Explosive Materials" is issued at least annually by the Director of the Bureau of Alcohol, Tobacco, and Firearms of the Department of the Treasury. The United States Department of Transportation classifications of Explosive Materials used in commercial blasting operations are not identical with the statutory definitions of the Organized Crime Control Act of 1970, Title 18 USC, Section 841. To achieve uniformity in transportation the definitions of the United States Department of Transportation in Title 49 Code of Federal Regulations Parts 1-999 subdivides these materials into: Class A Explosives—detonating or otherwise maximum hazard Class B Explosives - flammable hazard Class C Explosives - minimum hazard Blasting Agents - See definition of blasting agent.

EXPLOSIVE OILS Liquid explosive sensitizers for explosive materials. Examples include nitroglycerin, ethylene glycol dinitrate, and metriol trinitrate.

EXPLOSIVE STRENGTH The amount of energy released by an explosive upon detonation which is an indication of the capacity of the explosive to do the work.

EXTRA (AMMONIA) DYNAMITE A dynamite in which part of the nitroglycerine is replaced by ammonium nitrate in sufficient quantity to result in the same weight strength.

EXTRANEOUS ELECTRICITY Electrical energy, other than actual firing current or the test current from a blasting galvanometer, that is present at a blast site and that could enter an electric blasting circuit. It includes stray current, static electricity, RF (electromagnetic) waves and time-varying electric and magnetic fields.

FERTILIZER GRADE AMMONIUM NITRATE A grade of ammonium nitrate as defined by The Fertilizer Institute.

FIRE EXTINGUISHER RATING A rating set forth in the National Fire Code which may be identified on an extinguisher by a number (5, 20, 70, etc.) indicating the extinguisher's relative effectiveness followed by a letter (A, B, C, etc.) indicating the class or classes of fires for which the extinguisher has been found to be effective.

FIRE-RESISTANT Construction designed to offer reasonable protection against fire.

FIREWORKS Combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects.

FIRING CURRENT An electric current of recommended magnitude and duration to sufficiently energize and electric detonator or a circuit of electric detonators.

FIRING LINE The wire(s) connecting the electrical power source with the electric blasting circuit.

FLAG-DANGER Flags, usually red, which may or may not be imprinted with a warning and used to caution personnel around explosives operations, or displayed on trucks transporting explosives.

FLAMMABILITY The ease with which an explosive material may be ignited by flame and heat.



FLARE A pyrotechnic device designed to produce a single source of intense light.

FLASHOVER The sympathetic detonation between explosive charges or between charged blastholes.

FLASH POINT The lowest temperature at which vapors from a volatile combustible substance ignite in air when exposed to flame, as determined in an apparatus specifically designed for such testing.

FLYROCK Rocks propelled from the blast area by the force of an explosion.

FORBIDDEN OR NOT ACCEPTABLE EXPLOSIVES Explosives which are forbidden or not acceptable for transportation by common, contract, or private carriers, by rail freight, rail express, highway, air or water in accordance with the regulations of the U.S. Department of Transportation.

FRAGMENTATION The breaking of a solid mass into pieces by blasting.

FREE FACE A rock surface exposed to air or water which provides room for expansion upon fragmentation; sometimes called open face.

FUEL A substance which may react with oxygen to produce combustion.

FUME CLASSIFICATION See IME FUME CLASSIFICATION.

FUMES The gaseous products of an explosion. For the purpose of determining the fume classification of explosive materials, only poisonous or toxic gases are considered.

FUSE See SAFETY FUSE

FUSE CAP A detonator which is initiated by a safety fuse; also referred to as an ordinary blasting cap. Synonymous with BLASTING CAP, also see DETONATOR.

FUSE CUTTER A mechanical device for cutting safety fuse clean and at right angles to its long axis.

FUSE LIGHTERS Pyrotechnic devices for the rapid and certain lighting of safety fuse.

GAGE (WIRE) A series of standard sizes such as the American Wire Gage (AWG), used to specify the diameter of wire.

GALVANOMETER See BLASTING GALVANOMETER.

GAP SENSITIVITY The maximum length of gap across which a detonation wave will travel and initiate a second or receptor cartridge. Both primer and receptor cartridge should be of the same composition, diameter, and weight. Usually refers to gap in air but other media may be used.

GELATIN DYNAMITE A type of highly water-resistant dynamite characterized by its gelatinous or plastic consistency.

GEOLOGY A description of the types and arrangement of rock in an area; the description usually includes the dip and strike, the type and extent of pre-existing breaks in the rock, and the hardness and massiveness of the rock, as these affect blast design.

GRAINS In the avoirdupois system of weight measurement 7000 grains are equivalent to one standard 16 ounce pound (0.45 kg.). A grain is 0.0648 grams in both the avoirdupois and the troy system.

GROUND FAULT An electrical path between parts of the blasting circuit and earth.

GROUND VIBRATION Shaking the ground, by elastic waves emanating from a blast; usually measured in inches per second of particle velocity.

GVW Gross vehicle weight.

HANGFIRE The detonation of an explosive charge at some non-predictable time after its normally designed firing time.

HARDWOOD Red oak, white oak, hard maple, ash or hickory, free from loose knots, wind shakes, or similar defects.

HERTZ (Hz) Synonymous with "cycles per second."

HIGH EXPLOSIVES Explosives which are characterized by a very high rate of reaction, high pressure development, and the presence of a detonation wave in the explosive.

HIGHWALL A nearly vertical face at the edge of a bench, bluff, or ledge on a surface excavation.

HIGHWAY Any public street, public alley, or public road.



HOLE DIAMETER The cross-sectional width of the borehole.

IGNITER CORD A small-diameter pyrotechnic cord that burns at a uniform rate with an external flame and used to ignite a series of safety fuses.

IME FUME CLASSIFICATION A classification indicating the amount of carbon monoxide and hydrogen sulfide produced by an explosive or blasting agent. Explosives with positive oxygen balances are not considered as being acceptable in these classifications.

**Cubic Feet of Poisonous Gases
per (1 1/4" x 8") Cartridge of Explosive**

Fume Class	Material
1	Less than 0.16
2	0.16 to 0.33
3	0.33 to 0.67

INCENDIVITY The property of an igniting agent (e.g. spark, flame or hot solid) which indicates it is of sufficient intensity to ignite flammable material or explosive gases.

INHABITED BUILDING A building regularly occupied in whole or part as a habitation for human beings, or any church, school house, railroad station, store, or other structure where people are accustomed to assembly, except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosive materials.

INITIATION The start of deflagration or detonation in an explosive material.

INITIATOR A detonator, detonating cord or similar device used to start detonation or deflagration in an explosive material.

INSTANTANEOUS DETONATOR A detonator that has a firing time of essentially zero seconds as compared to delay detonators with firing times of from several milliseconds to several seconds.

INSTITUTE OF MAKERS OF EXPLOSIVES (IME) A non-profit, safety-oriented trade association representing producers of commercial explosive materials in the U.S. and Canada and dedicated to safety in the manufacture, transportation, storage, handling and use of explosive materials.

INSTITUTE OF MAKERS OF EXPLOSIVES NO. 8 TEST DETONATOR IME No. 8 test detonator has 0.40 to 0.45 grams PETN base charge pressed to a specific gravity of 1.4 g/cc and primed with standard weights of primer, depending on manufacturer.

INVENTORY A listing of all explosive materials stored in a magazine.

ISSUING AUTHORITY The governmental agency, office, or official vested with the authority to issue permits or licenses.

KELLY BAR A hollow bar attached to the top of the drill column in rotary drilling; also called grief joint, kelly joint, kelly stem.

LEADING (LEAD) LINES OR WIRES The wire(s) connecting the electrical power source with the circuit containing electric detonators. See FIRING LINE.

LEAKAGE RESISTANCE The resistance between the blasting circuit (including lead wires) and the ground.

LEG WIRES The two single wires or one duplex wire extending out from an electric detonator.

LIGHTNING STORM See ELECTRICAL STORM.

LIQUID FUELS Fuels in a liquid state. They may be used with oxidizers to form explosive materials.

LOADING Placing explosive material in a blasthole or against the material to be blasted.

LOADING DENSITY The weight of explosive loaded per unit length of borehole occupied by the explosive, expressed as pounds/foot or kilometers/meter of borehole.

LOADING POLE A non-metallic pole used to assist the placing and compacting of explosive charges in boreholes.

LOW EXPLOSIVES Explosives which are characterized by deflagration or a low rate of reaction and the development of low pressure. See DEFLAGRATION.

MAGAZINE Any building, structure, or container, other than an explosives manufacturing building, approved for the storage of explosive materials.

MAGAZINE KEEPER A person responsible for the inventory and safe storage of explosive materials, including the proper maintenance of explosive materials, storage magazines and areas.

MAGAZINE, SURFACE A specially designed and constructed structure for the storage of explosive materials on the surface of the ground.



MAGAZINE, UNDERGROUND A specially designed and constructed structure for the storage of explosive materials underground.

MAIN EXPLOSIVE CHARGE The explosive material that performs the major work of blasting.

MANUFACTURING CODES Code markings stamped on explosive materials packages, indicating among other information, the date of manufacture.

MANTRIP A trip on which personnel are transported to and from a work area.

MASS DETONATE (MASS EXPLODE) Explosive materials mass detonate (mass explode) when a unit or any part of a larger quantity of explosive material explodes and causes all or a substantial part of the remaining material to detonate or explode simultaneously. With respect to detonators "mass detonate" means that more than 90 percent of the devices or more than 25 grams of the explosive materials in the shipping container explode practically simultaneously.

MAXIMUM RECOMMENDED FIRING CURRENT The highest electric current which will result in the safe and effective performance of an electric detonator.

METALLIC SLITTER A device containing a sharp edge, such as a safety razor blade, used for slitting open fiberboard cases.

MILLISECOND One thousandth part of a second (.001 1/1000 sec.)

MINE SAFETY AND HEALTH ADMINISTRATION (MSHA) An agency of the Department of Labor concerned with promulgation and enforcement of health and safety regulations in the mining field.

MINIATURIZED DETONATING CORD Detonating cord with a coreload of 5 grains or less of explosives per foot.

MINIMUM RECOMMENDED FIRING CURRENT The lowest recommended electric current to ensure reliable performance of an electric detonator.

MINIMUM GAP SENSITIVITY An air gap, measure in inches or centimeters, which determines whether the explosive material is within specific tolerances for gap sensitivity. Also see GAP SENSITIVITY.

MISFIRE A blast or specific borehole that failed to detonate as planned. Also, the explosive material itself that failed to detonate as planned.

MONROE EFFECT The concentration of explosive action through the use of a shaped charge.

MOTOR VEHICLE A vehicle, machine, tractor, trailer, or semi trailer propelled or drawn by mechanical power. Does not include vehicles operated exclusively on rail.

MS CONNECTORS Nonelectric, short-interval (milliseconds) delay devices for use in delaying blasts which are initiated by detonating cord. Same as DETONATING CORD MS CONNECTORS.

MSHA APPROVAL A document issued by MSHA which states that an explosive or explosive unit has met MSHA requirements and which authorizes an approval marking identifying the explosive or explosive unit as approved as permissible.

MUCKPILE The pile of broken material resulting from a blast.

MUDCAPPING (MUDCAP) See ADOBE CHARGE. Synonymous with BULLDOZE, MUDCAP and PLASTER.

MULTIPLE PATH TRUNKLINE SYSTEM Duplication or repetition of trunkline elements in a blast initiation system to provide alternate paths of initiation.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS Standards for explosive materials and ammonium nitrate issued by the National Fire Protection Association.

NATIONAL SAFETY COUNCIL (NSC) A non-profit organization charged by Congress to provide a regular information service on the causes of accidents and ways to prevent them.

NATURAL BARRICADE Natural features of the ground such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare.

NITROGLYCERIN An explosive chemical compound used as a sensitizer in dynamite and represented by the formula C₃H₅(ONO₂)₃.

NO. 8 TEST CAP See INSTITUTE OF MAKERS OF EXPLOSIVES NO. 8 TEST DETONATOR.

NONELECTRIC DETONATOR A detonator that does not require the use of electric energy to function.



NONSPARKING METAL A metal that will not produce a spark when struck with other tools, rock, or hard surfaces.

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) An agency of the Department of Labor active in eliminating occupational hazards and promoting employee health and safety.

OFFICE OF SURFACE MINING (OSM) An agency of the U.S. Department of the Interior regulating surface coal mining and the surface effects of underground coal mining.

OVERBREAK See BACKBREAK.

OVERBURDEN Material of any nature laying on top of a deposit of material which is to be mined.

OXIDIZER OR OXIDIZING MATERIAL A substance, such as a nitrate, that readily yields oxygen or other oxidizing substances to promote the combustion of organic matter or other fuel.

OXYGEN BALANCE The percentage of oxygen in an explosive material or ingredient thereof in excess of (+) or less than (-) that which is needed to produce ideal reaction products.

PARALLEL BLASTING CIRCUIT An electric blasting circuit in which one leg wire of each detonator is connected to one of the wires from the source of firing current and the other leg wire of each detonator is connected to the other wire from the firing current source. (Can also be used to refer to certain nonelectric systems.)

PARALLEL SERIES CIRCUIT See SERIES IN PARALLEL BLASTING CIRCUIT.

PARTICLE BOARD A composition board made of small pieces of wood, bonded together.

PARTICLE VELOCITY A measure of the intensity of ground vibration, specifically the velocity of motion of the ground particles as they are excited by the wave energy.

PARTING A rock mass located between two seams of coal; a joint or crack in rock.

PASSENGER RAILWAY Any steam, electric, or other railroad or railway which carries passengers for hire.

PELLET POWDER Black powder pressed into cylindrical pellets 2 inches in length and 1 1/4 inches in diameter.

PERMISSIBLE DIAMETER (SMALLEST) The smallest allowable diameter of a particular permissible explosive, as approved by the Mine Safety and Health Administration (MSHA).

PERMISSIBLE EXPLOSIVES (MSHA APPROVED EXPLOSIVES) Explosives that are approved by the Mine Safety and Health Administration for use in gassy and dusty atmospheres. Permissible explosives must be used and stored in accordance with certain conditions specified by the Mine Safety and Health Administration (MSHA).

PERSON Any individual, corporation, company, association, firm, partnership, society, or joint stock company.

PETN An abbreviation for the name of the explosive pentaerythritol tetranitrate.

PLACARDS Signs placed on vehicles transporting hazardous materials (including explosive materials) indicating the nature of the cargo.

PLASTER See ADOBE CHARGE. Synonymous with BULLDOZE and MUDCAPPING.

PLYWOOD Exterior construction-grade plywood.

PNEUMATIC LOADING The loading of explosive materials into a borehole using compressed air as the loading or conveying force.

POWDER A common synonym for explosive materials.

POWDER PUNCH See CARTRIDGE PUNCH.

POWDER FACTOR The amount of explosive used per unit of rock. Also called EXPLOSIVE LOADING FACTOR.

POWER SOURCE The source of power for energizing electric blasting circuits; e.g., a blasting machine or power line.

PREBLAST SURVEY A documentation of the existing condition of structures near an area where blasting is to be conducted.

PREMATURE FIRING The detonation of an explosive charge before the intended time.



PRESPLITTING (PRESHEARING) A smooth blasting method in which cracks for the final contour are created by firing a single row of holes prior to the initiation of the rest of the holes in the blast pattern.

PRILLED AMMONIUM NITRATE Ammonium nitrate in a pelleted or prilled form.

PRIMARY BLAST A blast used to fragment and displace material from its original position to facilitate subsequent handling and crushing.

PRIMARY EXPLOSIVE A sensitive explosive which nearly always detonates by simple ignition from such means as spark, flame, impact, friction, or other primary heat sources of appropriate magnitude.

PRIMER A unit, package, or cartridge of explosives used to initiate other explosives or blasting agents, and which contains (1) a detonator; or (2) detonating cord to which is attached a detonator designed to initiate the detonating cord.

PROPAGATION The detonation of an explosive charge by an impulse received from an adjacent or nearby explosive charge.

PROPELLANT EXPLOSIVE An explosive material that normally functions by deflagration and is used for propulsion purposes. It may be a Class A or Class B explosive, depending upon its susceptibility to detonation.

PROPELLANT- ACTUATED POWER DEVICE Any tool or special mechanized device or gas generator system which is actuated by a propellant or which releases and directs work through a propellant charge.

PUBLIC CONVEYANCE Any railroad car, streetcar, ferry, cab, bus, aircraft, or other vehicle which is carrying passengers for hire.

PYROTECHNICS Any combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects. Also see FIREWORKS.

QUANTITY- DISTANCE TABLE A table listing minimum recommended distances from explosive materials stores of various weights to a specific location.

RADIO FREQUENCY ENERGY (RF) The energy radiated as electromagnetic waves in the radio frequency spectrum.

RADIO FREQUENCY TRANSMITTER An electronic transmitting device which radiates radio frequency waves. The transmitting device may be fixed (stationary) or mobile, and includes car telephones, citizen band radios, AM and FM radio transmitters, television transmitters and radar transmitters.

RAILWAY Any steam, electric or other railroad or railway.

RECEPTOR (ACCEPTOR) A charge of explosive materials receiving an impulse from an exploding donor charge.

REGULATIONS- FEDERAL, STATE, LOCAL Regulations promulgated by federal, state or local regulatory agencies governing the manufacture, transportation, storage, sale, possession, handling and use of explosive materials.

RELIEF The effective distance from a blasthole to the nearest free face.

RESISTANCE The measure of opposition to the flow of electrical current, expressed in ohms.

ROTATIONAL FIRING Delay blasting system used so that the detonating explosives will successively displace the burden into the void created by previously detonated explosives in holes which fired at an earlier delay period.

ROUND A group of boreholes fired or intended to be fired in a continuous sequence with the application of initiating energy.

SAFETY FUSE A flexible cord containing solid flammable material by which fire or flame is conveyed at a continuous and uniform rate from the point of ignition to a cut end. A fuse detonator is usually attached to that end, although safety fuse may be used without a detonator to ignite material such as deflagrating explosives.

SAFETY STANDARD Suggested precautions relative to the safety practices to be employed in the manufacture, transportation, storage, handling and use of explosive materials.

SCALED DISTANCE A factor relating similar blast effects from various weight charges of explosive material at various distances. Scaled distance referring to blasting effects is obtained by dividing the distance of concern by a fractional power of the weight of the explosive materials.



SEAM A stratum or bed of coal or other material. May also refer to a crack or joint in a blast area which may be filled with mud or other material. A seam may be in any orientation.

SECONDARY BLASTING Blasting to reduce the size of boulders resulting from a primary blast.

SEISMOGRAPH An instrument, useful in monitoring blasting operation, which records ground vibration. Particle velocity, displacement, or acceleration is generally measured and recorded in three mutually perpendicular directions.

SEMI-CONDUCTIVE HOSE A hose used for pneumatic conveying of explosive materials having an electrical resistance high enough to limit flow of stray currents to safe levels yet not so high as to prevent drainage of static electric charges to ground. Hose of not more than 2 megohms resistance over its entire length and of not less than 1,000 ohms per foot meets the requirements.

SENSITIVENESS A measure of an explosive's cartridge to cartridge propagating ability under certain test conditions. It is expressed as the distance through air at which a primed half-cartridge (donor) will detonate an unprimed half-cartridge (receptor). Also see GAP SENSITIVITY.

SENSITIVITY A physical characteristic of an explosive material classifying its ability to be initiated upon receiving an external impulse such as impact, shock, flame, friction, or other influences which can cause explosive decomposition.

SEPARATION DISTANCES Minimum recommended distances from explosive materials accumulations to other specified locations.

SEQUENTIAL BLASTING MACHINE A blasting machine designed to actuate separate series of detonators at accurately timed intervals. Also called SEQUENTIAL TIMER.

SEQUENTIAL TIMER See SEQUENTIAL BLASTING MACHINE.

SERIES BLASTING CIRCUIT An electric blasting circuit that provides one continuous path for the current through all caps in the circuit.

SERIES IN PARALLEL BLASTING CIRCUIT A circuit in which electric detonators are divided into two or more balanced groups being connected together in series and the groups being connected together in parallel.

SHAPED CHARGE An explosive with a shaped cavity, specifically designed to produce a high velocity cutting or piercing jet of product reaction; usually lined with metal to create a jet of molten liner material. Also see MONROE EFFECT.

SHEATHED CHARGE (MSHA APPROVED SHEATHED EXPLOSIVE UNIT) A device consisting of an approved or permissible explosive covered by a sheath encased in a sealed covering and designated to be fired outside the confines of a borehole.

SHELF LIFE The maximum storage period during which an explosive material retains adequate performance or physical characteristics.

SHOCK TUBE A small diameter plastic tube used for initiating detonators. It contains only a limited amount of reactive material so that the energy that is transmitted through the tube by means of a detonation wave is guided through and confined within the walls of the tube.

SHOCK WAVE A transient pressure pulse that propagates at supersonic velocity.

SHORT DELAY BLASTING The practice of detonating blastholes in successive intervals where the time difference between any two successive detonations is measured in milliseconds.

SHOT ANCHOR A device that anchors explosive material charges in the borehole so that the charges will not be blown out by the detonation of other charges. SHOT FIRER See BLASTER. (A shot firer usually refers to an underground coal mine blaster).

SHUNT (SHUNTING) The shorting together of the free ends of (1) electric detonator leg wires, or (2) the wire ends of an electric blasting circuit or part thereof. The term also applies to an electrical shorting device applied to the free ends of electric detonators by the manufacturer.

SIGNS-EXPLOSIVE (PLACARDS) Signs, called placards, placed on vehicles transporting explosives denoting the character of the cargo, or sign placed near storage areas as a warning to unauthorized personnel.

SILVER CHLORIDE CELL A special battery of relatively low current output used in some blasting galvanometers.

SLURRY An explosive material containing substantial portions of a liquid, oxidizers and fuel, plus a thickener.



SMALL ARMS AMMUNITION Any cartridge for shotgun, rifle, pistol, revolver, and cartridges for propellant-actuated power devices and industrial guns. Military-type ammunition containing explosive bursting charges or any incendiary, tracer, spotting, or pyrotechnic projectile is excluded from this definition.

SMALL ARMS AMMUNITION PRIMERS Small percussion-sensitive explosive charges encased in a cap or capsule and used to ignite propellant powder.

SMOKE The airborne suspension of solid particles from the products of detonation or deflagration.

SMOKELESS PROPELLANT (SMOKELESS POWDER) Solid propellant, commonly called smokeless powder in the trade, used in small arms ammunition, cannons, rockets, propellant-actuated power devices, etc.

SNAKEHOLE A borehole drilled in a slightly downward direction from the horizontal into the floor elevation of a quarry face. Also, a hole driven under a boulder.

SOCKET See BOOTLEG.

SOFTWOOD Douglas fir or other wood of equal bullet resistance and free from loose knots, wind shakes or similar defects.

SPACING The distance between boreholes. In bench blasting, the distance is measured parallel to the free face and perpendicular to the burden.

SPECIFIC GRAVITY The ratio of the weight of any volume of substance to the weight of an equal volume of pure water.

SPRINGING The practice of enlarging the bottom of a blasthole by firing a relatively small charge of explosive material. Typically use in order that a larger charge of explosive material can be subsequently loaded in the same borehole.

SQUIB A firing device that burns with an external flash. Used for igniting black powder or pellet powder.

STABILITY The ability of an explosive material to retain chemical and physical properties specified by the manufacturer when exposed to specific environmental conditions over a particular period of time.

STATIC ELECTRICITY Electric charge at rest on a person or object. It is most often produced by the contact and separation of dissimilar insulating materials.

STEADY STATE VELOCITY The characteristic velocity at which a specific explosive at a given charge diameter will detonate.

STEEL General purpose (hot or cold rolled) low-carbon steel such as specification ASTM A366 or equivalent.

STEMMING Inert material placed in a borehole on top of or between separate charges of explosive material. Used for the purpose of confining explosive materials or to separate charges of explosive material in the same borehole.

STORAGE The safekeeping of explosive materials, usually in specially designed structures called magazines.

STRAY CURRENT A flow of electricity outside an insulated conductor system.

SUBDRILLING The practice of drilling boreholes below floor level or working elevation to insure breakage of rock to working elevation.

SUBSONIC Less than the speed of sound in air at the elevation in question.

SUPERSONIC Greater than the speed of sound in air at the elevation in question.

SYMPATHETIC DETONATION The detonation of an explosive material as the result of receiving an impulse from another detonation through air, earth or water. Synonymous with SYMPATHETIC PROPAGATION.

SYMPATHETIC PROPAGATION See SYMPATHETIC DETONATION.

TABLE OF RECOMMENDED SEPARATION DISTANCES OF AMMONIUM NITRATE AND BLASTING AGENTS FROM EXPLOSIVES OR BLASTING AGENTS A quantity-distance table from National Fire Protection Association Standard No. 495.

TACHOGRAPH A recording device in a truck that indicates on a time basis the running and stopping times of a vehicle.



TAMPING The action of compacting the explosive charge or the stemming in a blasthole. Sometimes refers to the stemming material itself.

TAMPING BAGS Cylindrical bags containing stemming material and used in boreholes to confine the explosive material charge.

TAMPING POLES A wooden or plastic pole used to compact explosive charges or stemming.

TEST BLASTING CAP NO. 8 See INSTITUTE OF MAKERS OF EXPLOSIVES NO. 8 TEST DETONATOR.

THEFT-RESISTANT Construction designed to deter illegal entry into facilities used for the storage of explosive materials.

THUNDERSTORM See ELECTRICAL STORM.

TOE In bench blasting, excessive burden measured at the floor level of the bench.

TRUNKLINE See DETONATING CORD TRUNKLINE. (Certain shock tube or gas-initiated nonelectric initiating systems also use the term TRUNKLINE).

UNBARRICADED The absence of a natural or artificial barricade around explosive storage areas of facilities.

UNCONFINED DETONATION VELOCITY The detonation velocity of an explosive material fired without confinement: for example, a charge fired in the open. (Paper tubes are generally not considered as confinement.)

UNDERWRITERS LABORATORY, INC. (UL) A nationally recognized incorporated testing laboratory qualified and equipped to conduct the necessary tests to determine compliance with appropriate standards and the satisfactory performance of materials or equipment in actual usage.

U.S. BUREAU OF MINES (USBM) A bureau of the Department of the Interior active in promoting safety in coal mines and in carrying out broad programs in mining and related fields.

VOLT The unit of electromotive force. It is the difference in potential required to make a current of one ampere flow through a resistance of one ohm.

VOLUME STRENGTH Synonymous with CARTRIDGE STRENGTH. See BULK STRENGTH.

WARNING SIGNAL A visual or audible signal which is used for warning personnel in the vicinity of the blast area of the impending explosion.

WASTE ACID Residual or spent acid from a nitration process.

WATER GEL An explosive material containing substantial portion of water, oxidizers and fuel, plus a cross-linking agent.

WATER RESISTANCE The ability of an explosive to withstand the desensitizing effect of water penetration.

WATER STEMMING BAGS Water filled plastic bags with a self-sealing valve approved as a permissible stemming device by the Mine Safety and Health Administration (MSHA).

WATT A unit of electrical power equal to one joule per second.

WEATHER-RESISTANT Construction designed to offer reasonable protection against weather.

WEIGHT STRENGTH The energy of an explosive material per unit of weight. Often expressed as a percentage of the energy per unit of weight of a specified explosive standard.