

DOWNLOAD PDF EXPLOSIVES, PROPELLANT POWDERS, AND RELATED ITEMS

Chapter 1 : CHAPTER 56 EXPLOSIVES AND FIREWORKS | International Fire Code | ICC premiumACCES

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Brisance In addition to strength, explosives display a second characteristic, which is their shattering effect or brisance from the French meaning to "break" , which is distinguished and separate from their total work capacity. This characteristic is of practical importance in determining the effectiveness of an explosion in fragmenting shells, bomb casings, grenades , and the like. The rapidity with which an explosive reaches its peak pressure power is a measure of its brisance. Brisance values are primarily employed in France and Russia. The sand crush test is commonly employed to determine the relative brisance in comparison to TNT. No test is capable of directly comparing the explosive properties of two or more compounds; it is important to examine the data from several such tests sand crush, trauzl , and so forth in order to gauge relative brisance. True values for comparison require field experiments.

Density[edit] Density of loading refers to the mass of an explosive per unit volume. Several methods of loading are available, including pellet loading, cast loading, and press loading, the choice being determined by the characteristics of the explosive. High load density can reduce sensitivity by making the mass more resistant to internal friction. However, if density is increased to the extent that individual crystals are crushed, the explosive may become more sensitive. Increased load density also permits the use of more explosive, thereby increasing the power of the warhead. It is possible to compress an explosive beyond a point of sensitivity, known also as dead-pressing, in which the material is no longer capable of being reliably initiated, if at all.

Volatility[edit] Volatility is the readiness with which a substance vaporizes. Excessive volatility often results in the development of pressure within rounds of ammunition and separation of mixtures into their constituents. Volatility affects the chemical composition of the explosive such that a marked reduction in stability may occur, which results in an increase in the danger of handling.

Hygroscopicity and water resistance[edit] The introduction of water into an explosive is highly undesirable since it reduces the sensitivity, strength, and velocity of detonation of the explosive. Moisture affects explosives adversely by acting as an inert material that absorbs heat when vaporized, and by acting as a solvent medium that can cause undesired chemical reactions. Sensitivity, strength, and velocity of detonation are reduced by inert materials that reduce the continuity of the explosive mass. When the moisture content evaporates during detonation, cooling occurs, which reduces the temperature of reaction. Explosives considerably differ from one another as to their behavior in the presence of water. Gelatin dynamites containing nitroglycerine have a degree of water resistance. Explosives based on ammonium nitrate have little or no water resistance as ammonium nitrate is highly soluble in water and is hygroscopic.

Toxicity[edit] Many explosives are toxic to some extent. Manufacturing inputs can also be organic compounds or hazardous materials that require special handling due to risks such as carcinogens. The decomposition products, residual solids, or gases of some explosives can be toxic, whereas others are harmless, such as carbon dioxide and water. Examples of harmful by-products are: Heavy metals, such as lead, mercury, and barium from primers observed in high-volume firing ranges Nitric oxides from TNT Perchlorates when used in large quantities "Green explosives" seek to reduce environment and health impacts. An example of such is the lead-free primary explosive copper I 5-nitrotetrazolate, an alternative to lead azide.

Explosive train Explosive material may be incorporated in the explosive train of a device or system. An example is a pyrotechnic lead igniting a booster, which causes the main charge to detonate.

Volume of products of explosion[edit] The most widely used explosives are condensed liquids or solids converted to gaseous products by explosive chemical reactions and the energy released by those reactions. The gaseous products of complete reaction are typically carbon dioxide , steam , and nitrogen. Explosives with an oxygen deficit will generate soot or gases like carbon monoxide and hydrogen , which may react with surrounding materials such as atmospheric oxygen. Rather

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than produce typical waste gases like carbon dioxide, carbon monoxide, nitrogen and nitric oxides, CDP is different. Instead, the highly energetic reduction of carbon dioxide to carbon vaporizes and pressurizes excess dry ice at the wave front, which is the only gas released from the detonation. The velocity of detonation for CDP formulations can therefore be customized by adjusting the weight percentage of reducing agent and dry ice. CDP detonations produce a large amount of solid materials that can have great commercial value as an abrasive: Oxygen balance Oxygen balance is an expression that is used to indicate the degree to which an explosive can be oxidized. If an explosive molecule contains just enough oxygen to convert all of its carbon to carbon dioxide, all of its hydrogen to water, and all of its metal to metal oxide with no excess, the molecule is said to have a zero oxygen balance. The molecule is said to have a positive oxygen balance if it contains more oxygen than is needed and a negative oxygen balance if it contains less oxygen than is needed. Oxygen balance applies to traditional explosives mechanics with the assumption that carbon is oxidized to carbon monoxide and carbon dioxide during detonation. In what seems like a paradox to an explosives expert, Cold Detonation Physics uses carbon in its most highly oxidized state as the source of oxygen in the form of carbon dioxide. Oxygen balance, therefore, either does not apply to a CDP formulation or must be calculated without including the carbon in the carbon dioxide. Chemically pure compounds[edit] Some chemical compounds are unstable in that, when shocked, they react, possibly to the point of detonation. Each molecule of the compound dissociates into two or more new molecules generally gases with the release of energy. A highly unstable and sensitive liquid Acetone peroxide: A very unstable white organic peroxide TNT: Yellow insensitive crystals that can be melted and cast without detonation Cellulose nitrate: Very powerful explosives which can be used pure or in plastic explosives C-4 or Composition C An RDX plastic explosive plasticized to be adhesive and malleable The above compositions may describe most of the explosive material, but a practical explosive will often include small percentages of other substances. For example, dynamite is a mixture of highly sensitive nitroglycerin with sawdust , powdered silica , or most commonly diatomaceous earth , which act as stabilizers. Plastics and polymers may be added to bind powders of explosive compounds; waxes may be incorporated to make them safer to handle; aluminium powder may be introduced to increase total energy and blast effects. Explosive compounds are also often "alloyed": Mixture of oxidizer and fuel[edit] An oxidizer is a pure substance molecule that in a chemical reaction can contribute some atoms of one or more oxidizing elements, in which the fuel component of the explosive burns. On the simplest level, the oxidizer may itself be an oxidizing element , such as gaseous or liquid oxygen.

Chapter 2 : HSE Explosives - Frequently asked questions

Explosives, Propellant Powders, and Related Items Keywords Explosives, Propellant Powders, and Related Items, Publication Industry and trade Summary.

What should the plans show? Any plans should be proportionate to its function, and so where zero separation distances apply it would be expected that the plans would be simple, but still identify: This means the plan of the site that you provide should show the whole area over which you have control including car parks and on-site petrol stations etc, as well as any adjoining land that is under your control. Is the requirement to provide plans new? The requirement for maps and plans is not new. MSER also required the register to include maps in a scale sufficient to show the location of any stores. How much explosives can I store? The quantity of explosives that can be stored is governed by: Every person who stores explosives at a site must ensure that the relevant separation distances prescribed by Schedule 5 of the Explosives Regulations, are maintained. Separation distances also apply to the storage of explosives even when a licence is not required. Generally, the separation distance you will be required to maintain will depend on the: Your licensing authority will be able to advise you on whether separation distances will apply. The section on separation distances provides more information. How long can I get a licence for? It depends on what you need the licence for and who you are applying to for your licence. Licences for the Manufacture of Explosives, and the storage of more than kg of explosives, issued by HSE can be granted for any period remain in force until such time that they are revoked or varied. Licences for the storage of no more than kg of explosives can be issued by the licensing authority for up to 5 years as the licensing authority determines. For licences issued by the police or local authority Contact your relevant licensing authority. For licences from HSE to manufacture, or the storage of more than kg. If it is a new licence HSE will normally visit the site as part of the application process, so the target time can vary, depending on whether the site is suitable and all the information is correct. If the application is for a renewal licence, there is no change to the quantity or hazard type being stored and there have been no changes to the available separation distances around the store the target time to agree licences is approximately weeks. How much does it cost for a licence? The price of a licence depends on the type of licence requested. For a licence the storage of no more than kg of explosives, the fee is dependant on whether it is a new licence, or a renewal and the period for which it is granted for. For a licence requiring local authority assent, an initial fee is charged with a fee per hour worked on the licence. The actual amount will vary depending on processing time and work involved. Will my current explosives licence or registration issued prior to the 1st October still be valid? Your current licence or registration issued under The Manufacture and Storage of Explosives Regulations MSER will remain valid under the transitional provisions of the Explosives Regulations until it either reaches its expiry date or you need to change it. Contact your licensing authority if you require further advice. I am a licensing authority, and have received an application for storage of explosives for 5 years-do I have to grant the licence for 5 years? Licensing authorities will be expected to take a proportionate, risk-based approach that recognises the nature of business and the likely lifetime of the licensed site. Other factors that should also be considered: Regulation 6 2 a allows the manufacture of small quantities of explosives without a licence provided the explosives are being manufactured for laboratory analysis, testing, demonstration and experimentation. What do these terms mean? Laboratory analysis, testing, demonstration and experimentation are not defined in the regulations but in order to ensure the purposes for which an explosive can be acquired or acquired and kept are consistently described and understood the enforcing authorities have agreed that: Contact your local police explosives liaison officer for advice Recast of the civil explosives directive.

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Chapter 3 : Propelling Charge, mm, M (MACS)

The charge consists of approximately 28 pounds of M31A1E1 stick propellant and a cloth igniter base pad encased in rigid combustible cartridge case end cap. The cloth igniter base pad contains ounces of black powder and ounce of CBI.

About Us admin T We are also a principal supplier of small arms ammunition to the New Zealand Defence Force. Australian Munitions also produces high quality propellant and ammunition for military and civilian domestic and international customers. Australian Munitions can trace its ammunition heritage back to the late 19th century, through the establishment of the Colonial Ammunition Company in Victoria and played a key role restructuring the Australian munitions manufacturing industry landscape over the final decade of the 20th century. Our Benalla site produces ammunition, explosive ordnance and other munitions, while the Mulwala site focuses on high quality propellants and explosives. ADI Powders ADI Powders cater for the full range of burning rate requirements from the fast burning handgun and shotgun powders to the very slow large calibre rifle powders. The shotgun powders are disc powders, double base in composition, covering a wide range of applications in 12, 20 and 28 gauge loads. All the shotgun powders are exceptionally clean burning. ADI handgun powders are smaller diameter disc powders manufactured for uniform metering through powder loaders. The faster burning powders are double base in composition for increased energy. The slower burning powders are single base for use in heavy loads. All the handgun powders are exceptionally clean burning when loaded correctly. The rifle powders are single perforated tubular propellants of single base composition. Consequently, all the rifle powders have, as a feature, ballistic temperature independence; that is, velocities and pressures do not vary greatly with ambient temperature. In addition, the ADI powders all have good loading characteristics with respect to bulk density and uniformity of metering through powder loaders. They are also very clean burning at normal loads. The new Trail Boss propellant is single base in composition. It is shaped in discs with an obvious central hole which makes it easy to distinguish from other powders. The innovative propellant was designed to overcome the excessive space in your case for more consistent ballistic and safety performance. ADI powders are packed in grams, 1kg, 1.

Chapter 4 : About Us - ADI Word Class Powders and Ammunition

Chemicals and Related Products To view changing data, hover over or touch the animated graphic below. Table CH.1 Chemicals and related products: U.S. exports and general imports, by selected trading partners,

Chapter 5 : List of Explosive Materials | Vanderbilt Environmental Health and Safety

Opportunity to Ease Export Restrictions on Propellants and Related Items The U.S. State and Commerce Departments have issued proposed rules that would ease the export restrictions on certain chemicals used to make propellants and explosives.

Chapter 6 : PPT “ EXPLOSIVES: PowerPoint presentation | free to download - id: ZDc1Z

The use of smokeless powders, high explosives and propellants for commercial blasting goes back at least 30 years to the major expansion efforts on the Mesabi and Vermilion iron ore deposits, collectively known as the Iron Range, north of Minneapolis, Minnesota.

Chapter 7 : Small Cal Propellant by Eurenco

(This note applies to all technology controls in Categories 1 to 9 of the Dual-use List.) 1. The export of "technology"

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which is "required" for the "development", "production" or "use" of goods controlled in Categories 1 to 9, is controlled according to the provisions of Categories 1 to 9.

Chapter 8 : EXPLOSIVES PROPELLANT POWDERS | Discount Safety Signs New Zealand

Propellants with fine AP burn faster in calendrierdelascience.comyl-terminated-polybutadiene (HTPB) composite mixtures containing Al powder are the most frequently used in solid rocket propellants world-wide. so significant burning rate tailoring is effected by the choice of suitable distribution of particle size of AP in the propellant.

Chapter 9 : Propellant - Wikipedia

Hazchem Signs EXPLOSIVES PROPELLANT POWDERS. Increase the life of your signs by up to 3 years with a UV and Weather proof protective over laminate.