

Desensitised Explosives

General Information

Desensitised explosives are solid or liquid explosive substances which are wetted, diluted, dissolved or suspended with a phlegmatiser in order to suppress or at least reduce their explosive properties.

For transport some desensitised explosives are specifically listed and special provisions which are to be met are assigned to them. Depending on their physical state and the substances used to achieve desensitisation they are then classified as flammable solids or flammable liquids.

However, desensitised explosives may become again explosive under certain circumstances – especially after long term storage and during handling and use, e.g. when the phlegmatising substance is removed or its concentration is decreased for example due to evaporation – and some desensitised explosives may have explosive properties even in the desensitised state.

Obtaining and Storage of Desensitised Explosives

Some researchers have reported difficulties in ordering new stock of chemicals that are classed as desensitised explosives, as reputable suppliers now require evidence of registration under the Manufacture and Storage of Explosives Regulations 2005 (MSER) and certification under the Control of Explosives Regulations 1991 (COER).

The licensing requirements are as follows:-

- The purchaser must possess a Police Explosives Certificate to “acquire and keep explosives” issued under COER, regardless of the quantity purchased.
- For quantities of no more than 30Kg Storage Registration under MSER (Reg. 11) is required.
- For quantities greater than 30Kg a Storage Licence under MSER (Reg. 10) is required, unless the specific exemptions of this regulation apply.
- If it is intended to use the desensitised explosive to manufacture an explosive substance a Manufacturing and Storage Licence under MSER (Reg. 9) is required, unless the quantity of explosive being manufactured is not more than 100g in which case only the Storage Licence is required. Storage Registration is not permitted for this use even if the quantity involved is not more than 30Kg.

UN numbers

The need for licensing is triggered by allocated UN numbers. UN numbers are four-digit numbers that identify dangerous goods and articles (such as explosives, flammable liquids, toxic substances, etc.) in the framework of

international transport. These UN numbers are used to classify and identify desensitised explosives. Some dangerous goods have their own UN numbers (e.g. Urea Nitrate (wetted with $\geq 10\%$ water by mass) has UN 3370), while sometimes groups of chemicals or products with similar properties receive a common UN number (e.g. Desensitized Explosive, Solid N.O.S has UN 3380). A chemical in its solid state may receive a different UN number than the liquid phase if their hazardous properties differ significantly (e.g. Desensitized Explosive, Liquid N.O.S has UN 3379).

Substances with different levels of purity and for the purposes of Desensitized Explosives, the amount of wetting agent present, may also receive different UN numbers (Picric acid (2,4,6 trinitrophenol) with $\geq 30\%$ water, by mass has UN1344, Picric acid (2,4,6 trinitrophenol) with $\geq 10\%$ water, by mass has 3364).

There is an extensive list of desensitised explosives, however many are exempt under the Explosive Regulations. The chemicals in the table below require both a certificate to acquire under COER and registration to store under MSER. The UN number can be found on the Material Safety Data Sheet (MSDS) for a particular chemical.

Chemical Name	UN number	Class
Nitro-glycerine mixture desensitized, solid, n.o.s. with more than 2% but not more than 10% nitro-glycerine	3319	4.1D
Nitro-glycerine mixture desensitized, liquid, flammable, n.o.s. with not more than 30% nitro-glycerine by mass	3343	3D
Pentaerythrite tetranitrate mixture, desensitised, solid, n.o.s. with more than 10% but not more than 20% PETN by mass	3344	4.1D
Nitroglycerin mixture desensitized, liquid, n.o.s. with not more than 30% nitroglycerin by mass	3357	3D
Picric acid (2,4,6 trinitrophenol) with \geq	3364	4.1D

10% water, by mass		
Trinitro chlorobenzene (Picryl chloride), wetted with $\geq 10\%$ water by mass	3365	4.1D
Trinitrotoluene, wetted with $\geq 10\%$ water by mass	3366	4.1D
Trinitrobenzene, wetted with $\geq 10\%$ water by mass	3367	4.1D
Trinitrobenzoic acid, wetted with $\geq 10\%$ water by mass	3368	4.1D
Urea nitrate, wetted with $\geq 10\%$ water by mass	3370	4.1D
Desensitized explosive, Liquid N.O.S	3379	3D
Desensitized explosive, Solid N.O.S.	3380	4.1D
1-Hydroxybenzotriazole hydrate (Hobt)	3380	4.1D

Excerpt from COER regarding certification;

Explosives certificate

4. (1) An explosives certificate is a certificate certifying that the person to whom it is issued is a fit person-

(a) to acquire explosives; or

(b) to acquire and keep explosives, in accordance with the terms of the explosives certificate and shall be in the form of the certificate in Schedule 2 or one to the same effect.

(2) Subject to paragraph (8), an application for an explosives certificate shall be made to the chief officer of police for the relevant police force.

(3) The Executive may from time to time approve in writing a form of application for an explosives certificate and if it does so any such application

shall be in the approved form or one to the same effect.

(4) Subject to paragraphs (5) and (6), a chief officer of police shall issue an explosives certificate to a person who he is satisfied is a fit person to hold a certificate in those terms.

(5) A chief officer of police shall not issue an explosives certificate to a person if the chief officer of police is satisfied that the person is of unsound mind or intemperate habit.

(6) A chief officer of police shall not issue an explosives certificate to a person unless the chief officer of police is satisfied that-

- (a) the person has good reason for acquiring the explosives;
- (b) subject to paragraph (7), the person is a responsible person who may be permitted to acquire the explosives without danger to public safety or peace;
- (c) subject to paragraph (7), the person will take all reasonable precautions to prevent access to the explosives by unauthorised persons and to prevent loss of the explosives;
- (d) the person is not a prohibited person;
- (e) where the person is a body corporate, no director or secretary of the body corporate, and where the person is a Scottish firm, no partner in the firm, is a prohibited person;
- (f) where the application is for a certificate relating only to acquisition of explosives, it is not reasonably practicable for the applicant to be an occupier of a licensed factory, licensed magazine, store or registered premises and the explosives either will not be kept, or, if kept, the applicant will ensure that they are kept in a licensed factory, licensed magazine, store or registered premises or in premises occupied by the Secretary of State; and
- (g) where the application is for a certificate relating to keeping of explosives, either-
 - (i) the applicant is or is to be the occupier of a licensed factory, licensed magazine, store or registered premises, or
 - (ii) the explosives will be kept in premises occupied on behalf of the Crown, or
 - (iii) the explosives are to be kept for private use, and will be kept in a licensed factory, licensed magazine, store or registered premises, or are of one or more of the descriptions specified in regulation 10(1).

(7) Sub-paragraphs (b) and (c) of paragraph (6) shall not apply in respect of explosives kept or to be kept in a licensed factory or licensed magazine.

(8)

(a) This paragraph applies with respect to an explosives certificate which would, if granted, certify only that the holder is a fit person to acquire explosives and where the person who would be the holder is not resident in Great Britain or, in the case of a body corporate, does not have a registered office or any other office in Great Britain.

(b) Where this paragraph applies, the application for an explosives certificate may be made by a person resident in Great Britain who has knowledge of and control over any occasion when the person to whom the certificate would relate would acquire or use explosives.

(c) An application under this paragraph shall be made to the chief officer of police for the police area in which the person who makes the application resides or, in the case of a body corporate, has its registered office or, if it has no registered office, its principal office.

(9) The holder of an explosives certificate shall inform the chief officer of police who issued it of any change in the holder's address or, where the holder is a body corporate or partnership, of its proper address for the purposes of section 46(4) of the Health and Safety at Work etc. Act 1974, either before or forthwith after any such change occurs.

Excerpt from MSER regarding registration in relation to storage;

11.

(1) Subject to paragraph (5), a person who wishes to store within one site at any one time no more than

- (a) 30 kilograms of explosives of any hazard type;
- (b) 100 kilograms of hazard type 3 explosives;
- (c) 100 kilograms of a combination of hazard type 3 explosives with explosives of hazard type 4;
- (d) 250 kilograms of hazard type 4 explosives; or
- (e) 250 kilograms of small arms ammunition and percussion caps and 30 kilograms of shooters' powder; may apply to the licensing authority in whose area the storage will take place to be registered in respect of that storage.

(2) The licensing authority shall register the applicant unless any of the grounds for refusing to do so referred to in regulation 15 apply.

(3) Where a licensing authority registers an applicant, it shall issue the applicant with a certificate of registration, in a form approved for the time being for the purposes of this regulation by the Executive.

(4) A registration, not being a renewal of a registration, shall remain in force for such period not exceeding two years as the licensing authority determines, save that -

(a) subject to sub-paragraph (b), where the applicant for the registration has been granted an explosives certificate, a registration may be granted for any period not exceeding the due expiry date of that explosives certificate where that date is later than that two year period; or

(b) where the application for registration relates, whether solely or not, to the storage of smokeless powder, a registration may be granted for any period not exceeding three years.

(5) For the purposes of paragraph (1) no more than one of the exceptions listed in sub-paragraphs (a) to (e) of paragraph (1) shall apply to explosives stored at the same site at the same time, irrespective of the person who is storing them.

(6) Where the registration relates to the storage at a site of pyrotechnic articles which are to be offered for sale at that site, the amount of those pyrotechnic articles which may be kept for any period of time in a sales area at that site shall be restricted to the amount determined in accordance with Schedule 3 and for these purposes and those of Schedule 3, "sales area" means an area where pyrotechnic articles are sold and to which any person who is not an employee of the person who is registered in respect of the storage of those pyrotechnic articles has access.

(7) No application for registration may be made in respect of the storage of explosives at a site at which the manufacture of explosives also takes place or is to take place.

(8) The quantities referred to in paragraph (1) are the maximum quantities of the explosives or explosive articles they respectively relate to which may be present at a registered site at any one time.

(9) A renewal of a registration may be granted for any period not exceeding one year, save that -

(a) subject to sub-paragraph (b), where the applicant for the renewal has been granted an explosives certificate, a renewal of a registration may be granted for any period not exceeding the due expiry date of that explosive certificate where that date is later than that one year period; or

(b) where the application for renewal of registration relates solely to the storage of smokeless powder, a renewal of registration may be granted for any period not exceeding three years.

Local Procedure to obtain License/Registration

The competent person who is to be in charge of the material designated a 'desensitised explosive' (the applicant) should contact the Explosives Licensing Officer at Lothian and Borders Police (currently: Ian Dickson, Direct dial: 01506 859315, Email: ian.dickson@lbp.pnn.police.uk please have the UN number of the material to hand. The Licensing Officer will arrange to visit the proposed holding School to interview the applicant and to view the storage arrangements. If all is in order the application goes before the Chief Constable for approval, if all is not acceptable alterations, in order to comply, will have to be put in place and a revisit organised before the application goes before the Chief Constable.

The School of Chemistry hold a licence and registration for desensitised explosives, it would therefore be prudent if any other School intending to apply for such certification/registration viewed their storage facilities to ensure that any proposed storage facility in the new applicant School meets the required standard.

It should be noted that certification/registration incurs a fee payable by the applicant School to Lothian and Borders Police.

Occupational Hygiene Unit
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