



## Dangerous Goods Safety Bulletin No. 0210

**Date:** 13 April 2010

**Subject:** Confinement of a small quantity of 1.4S explosives can result in large explosion

### Hazard

A dangerous situation with a high risk of explosion can result when explosives of hazard classification 1.4S are confined (e.g. in a lined metal box) and exposed to fire.

### Contributory factors

Explosives of hazard classification 1.4S are commonly believed to be “safer” than other explosives. This assumption is not always correct, and appropriate measures must be taken to reduce the risk of explosion.

Explosives substances or articles classed as 1.4S are packaged or designed to limit blast and projection hazards if accidentally initiated. It is important to be aware that some items of hazard classification 1.4S can be highly explosive (e.g. detonators or articles filled with black powder) but, due to robust packaging and dunnage, any blast effects are minimised. However, these items still have significant explosive potential.

A sealed package of 1.4S explosives directly exposed to fire will burn, with the resulting gases released to the atmosphere. The blast and projection hazards are limited to the packaging, or are sufficiently minor that an emergency response is not inhibited. In contrast, when the same package is confined in a carry box, magazine or other sealed container and exposed to fire, the gases produced can be trapped, resulting of a build-up of pressure inside the container. If the pressure becomes too great, the container will explode.

Shotfirers, firework operators and firework contractors are authorised to store limited quantities of explosives under the provisions of their licence. The Dangerous Goods Safety (Explosives) Regulations 2007 require the explosives to be stored safely, which includes storing the product inside a container. The choice of container has a significant impact on the consequences of fire on the explosive product.

- A potential mass explosion hazard exists for hazard classification 1.4S explosives that are under confinement (e.g. inside a wood-lined metal box) and exposed to fire or other intense heat.
- An explosion resulting from fire impacting upon 1.4S explosives under confinement (e.g. in a carry box or magazine) can be significantly large and hazardous.
- Consideration must be given to the type of explosives stored (irrespective of packaging) and appropriate safety measures must be applied. The material safety data sheet (MSDS) should be reviewed for information about the hazards of the product.
- Do not assume that 1.4S explosives will generate only minor explosions – large explosions can occur.
- The emergency response must be appropriate to minimise risk – if 1.4S explosives are stored inside lined, metal containers and involved in a fire, the area should be evacuated immediately. For storages of 1.4S explosives up to 30 kg, the recommended evacuation distance is 400 metres.

*Note: This distance is also suitable for up to 30 kg of explosives that have been classified as 1.4S due to packaging, but the items themselves have a mass explosion hazard (e.g. detonators).*

## Recommendations

- Explosives of hazard classification 1.4S should be stored inside a wooden box, which will burn in the event of a fire and allow gases to be released to atmosphere.
- If a metal box without ventilation must be used, evacuate to a distance of 400 metres if the box is involved in a fire.
- Adequate security measures that are commensurate with the type of explosives are still required.

A handwritten signature in black ink, appearing to read 'P. Hine', followed by a horizontal line that tapers to a point on the right.

Philip Hine

DIRECTOR DANGEROUS GOODS SAFETY