

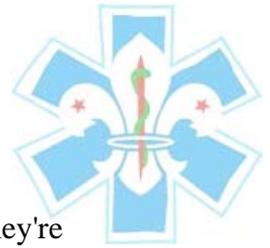


## Emergencies Adventure Skills



# Fact Sheet: FLARES





## Emergencies Adventure Skills

Thank heavens for flares, which have saved countless lives at sea. They're fantastically simple signalling devices designed to communicate a direct message in an emergency. A flare is a type of pyrotechnic (firework) that produces a brilliant light or intense heat without an explosion. Flares are used for signalling, illumination, or defensive countermeasures in civilian and military applications. Flares may be ground pyrotechnics, projectile pyrotechnics, or parachute-suspended to provide maximum illumination time over a large area. Projectile pyrotechnics may be dropped from aircraft or deployed by flare guns or handheld percussive tubes.

Have you ever wondered what they're made of and how they work? Let's take a closer look.

### What is a flare?

A flare is a tube packed with explosive chemicals that burn very brightly or gives off smoke, usually to attract attention in an emergency. The two main kinds are

- **Handheld flares** (which operate on the ground)
- **Rocket flares** (which are fired into the air)

#### *Handheld flares*

Handheld flares also come in two kinds. *Signal flares* burn with a bright red light as you hold them, while *smoke flares* are designed to be held in the hand, placed on the ground, or dropped overboard into the sea to give off huge plumes of colourful (generally orange or red) smoke. Flares like this are typically visible up to about 5km (3 miles) away for anything from 30 seconds to several minutes. Since smoke doesn't generate light, smoke flares are useful only in daylight.

#### *Rocket flares*

Rocket flares are bright enough to work in daytime or night. They're usually fired high in the air so they can be seen from much greater distances than handheld flares, up to 40km (25 miles) in good visibility. The simplest ones are like fireworks, with two "stages" (separate explosive burning sections) and are entirely self-contained. You hit them on the base (or bang them on the ground or the deck of a ship) to strike an explosive percussion cap. This triggers the first stage, which propels the inner part of the flare into the air for several seconds. At that point, when the rocket has reached a height of maybe 100m (300ft), the second stage ignites and the flare explodes with an intensely bright red or orange light. Some flares release red stars.

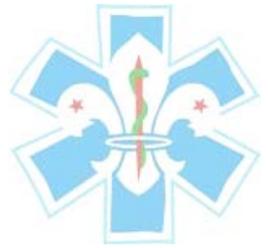
Another kind of rocket flare is fired from a specially designed *flare gun* or *Very pistol*<sup>1</sup>. These flares are aluminium tubes approximately 3cm in diameter and 30cm long. When they're fired, they shoot rapidly to a height of about 300m (1000ft). At that point, they explode with a loud bang and release a brightly burning flare suspended from a small parachute that drifts very slowly downward, maximizing the amount of time for which it can be seen.

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<sup>1</sup> named for American naval officer Edward Very, who invented it in 1877



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### Chemical ingredients

Flares produce their light through the combustion of a pyrotechnic composition. The ingredients are varied, but often based on strontium nitrate (which provides the colour—it burns with a bright red or orange-red flame), potassium nitrate, or potassium perchlorate (a powerful oxidizer, which makes the strontium burn rapidly) and mixed with a fuel such as charcoal, sulphur, sawdust, aluminium, magnesium (which burns very brightly), or a suitable polymeric resin. Flares may be coloured by the inclusion of pyrotechnic colorants. Calcium flares are used underwater to illuminate submerged objects.

### Colours

Red and orange flares always indicate distress and if you see one you need to take action. White flares work in the same way but are usually designed to illuminate an area at night (for example, if someone falls overboard) or to prevent imminent collisions at sea (by indicating a ship or boat's position to another vessel); they don't normally indicate danger.