

# Marine Safety Flash

## A16-38 (14<sup>th</sup> October)

### Proper and safe use of extension leads

#### Incident Overview

A crewmember was observed using an unwounded extension lead on board.

#### Key Findings

The danger is that if they are carrying significant current (for the gauge of wire) they will get warm or hot. This may cause insulation breakdown or fire as the heat current rating of the cable drastically changes when tightly coiled on a spool or reel.

Why cable reels can be dangerous

Current flowing in a cable generates heat. This causes the temperature of the conductors to rise until the heat lost balances the heat generated. If the temperature gets too high the insulation on the cable softens and eventually melts.

When you pack lots of cables that are all carrying current (whether multiple separate cables or multiple loops of the same cable) together heat dissipation suffers resulting in a higher temperature at a given current.

Reels are particularly bad because they tightly pack together a large number of passes of the cable. Excess cable in a loose jumble on the ground is far less likely to overheat than excess cable wound tightly on a reel.

Users may get away with it most of the time because most of the loads plugged into extension leads are small and/or intermittent. From time to time though the right combination of circumstances come together and melts one.

Because the cables contain the feed and return current in very close proximity the inductance caused by the current to the load is exactly cancelled out by the current returning from the load.



Example of Insulation breakdown resulting from heat accumulation.

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## Recommendations

Persons using extension leads have a responsibility and duty of care to:

- Ensure cable drum extension lead is completely unwound to avoid overheating
- Ensure the lead has an electrical safety tag fitted and is within date
- Position the extension lead carefully to prevent any risk of damage
- Cover it with a rubber protector strip if the cable has to cross a pathway
- Always visually check that leads, plugs and sockets are undamaged prior to use; and always verify the extension lead has the correctly rated plug for the equipment being used.