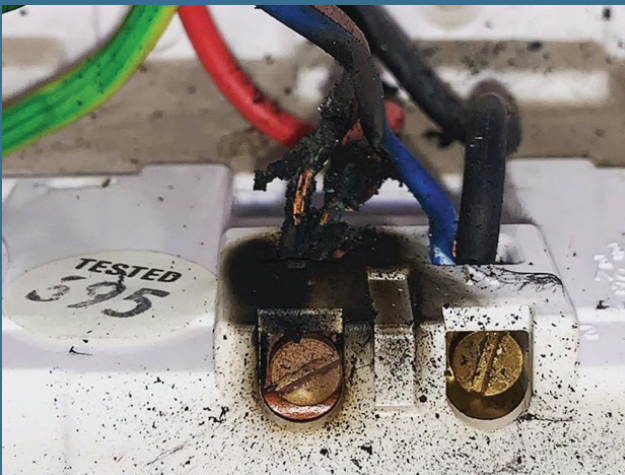


What is an arc fault?

An arcing fault is an unintentional arcing condition in a circuit. Arcing creates high intensity heating at the point of the arc resulting in burning particles that can over time ignite surrounding material. Repeated arcing can create carbon paths that are the foundation for continued arcing, generating even higher temperatures. The temperatures of these arcs can exceed 6000 °C.

The following illustrates a typical arcing fault creating carbon paths.



The following illustrates the development of an arcing fault as a result of conductor damage.

An electrical wire is damaged.



The wire and insulation layer become too hot.



The insulation layer is carbonised and the copper conductor melts. A gap is generated, resulting in an electrical discharge.



An arc fault is formed and an electrical fire is produced.



Contact a BEAMA member for more information.

Download the BEAMA AFDD guide from www.beama.org.uk or scan the QR code



Causes of Arc Fault

Development of an arc fault

Arc faults are unpredictable and can take time to develop. The time for an arc fault to form is dependent on its root cause (external influences, ageing, etc).

Arc faults can occur quickly or over a long period (hours, days, weeks, months, years). With the arc developing, temperatures up to 6000 °C can be generated producing carbon and eventually a fire develops.

Arc faults can occur in many locations, with varied root causes, for example:

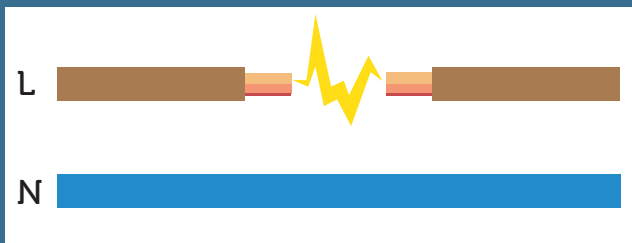
Types of arc fault

Arc faults can be series or parallel as follows:

a) Series arc fault current

Originates from

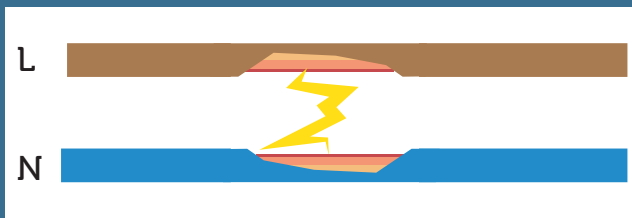
- Damaged (e.g. crushed, broken, etc.) cables
- Loose connections



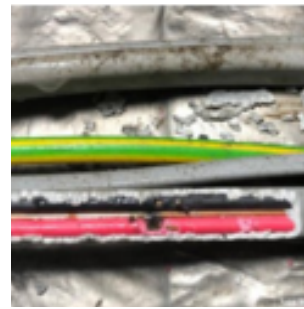
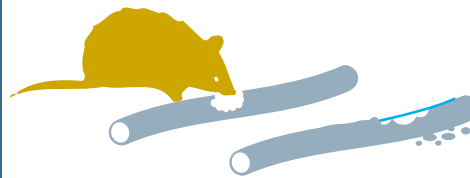
b) Parallel arc fault current (L-N) (L-E)

Originates from:

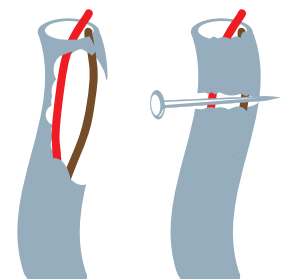
- Fault between L-N / L-E
- High impedance due to damaged insulation.



Rodent damage

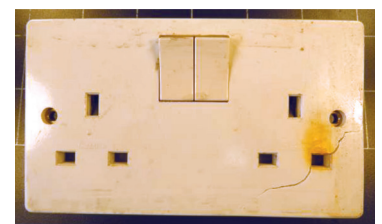
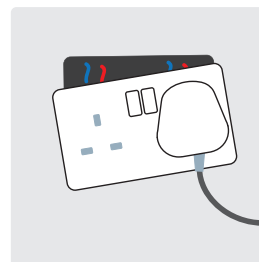
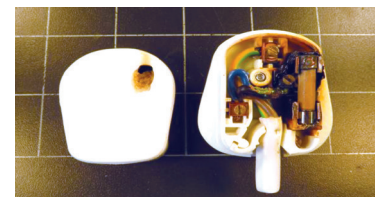
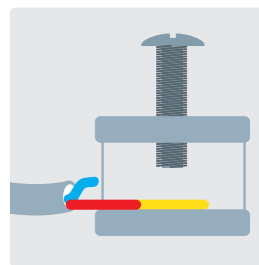


Damaged insulation



NOTE: Arc Fault Detection Devices (AFDDs) will detect arcing faults. Including arcing at loose connections, series arcs in cable conductors and parallel arcs between cable conductors.

Loose terminations



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