



Safety Note 52

The use of electrical extension systems

Introduction

The number of electrical items of equipment in use at work and at home has proliferated in recent years. However, the number of power points where we can plug in has not kept pace; hence the common use of the electrical extension. Extensions come in many forms; the one common denominator is that they tend to be misused and abused. This Safety Note provides advice on safe use, to avoid the potential risks of fire or electric shock.

Types of extensions

There are a wide variety of types of electrical extensions, either to increase the distance or to increase the number of items we can plug in. They include multiblock adaptors, cable extensions with a single plug point, multi gang bar extension leads and cable reels. Some types do both tasks and they all have good points as well as bad.

Common Problems

Overloading

The biggest problem with extension leads is overloading. This can be caused by plugging too many items into the extension bar or plugging one extension lead into another. You should never lose sight of the fact that they ultimately plug into a wall socket that is rated at a maximum of 13 amps or 3kW.

Using all the available sockets and overloading the system can cause the extension to overheat; this is particularly prevalent in systems with coiled cables. There is a chance that in fault conditions and with added resistance due to multiple fuses and heavy duty cables in the system, the fuse will not activate until a fire is well alight.

Damage to cables

The other issue is trapping or damage to the cable as it goes through doors and windows, or when it is walked on. This can lead to the internal wires becoming exposed and damaged, with the risk of electrical shock.

Exposure to weather/moisture

Any extension that goes outside the building must have a protection device such as a Residual Current Device (RCD) fitted to the point where it enters the mains power system. The RCD is a device that constantly compares current in and out. When it detects a change i.e. when the cable is cut or the current finds a better path to earth via the user, it will trip out and cut the supply fast enough to prevent death in normally healthy humans. To reduce the likelihood of injury the RCD must have a tripping current of not more than 30 milliamps (mA). RCDs with a higher tripping current are used to protect against fire. RCDs must be regularly tested by pressing the 'test' button, and by making sure that the RCD operates. Faulty RCDs must be removed from use.

The preferred system is to have a dedicated weatherproof RCD supply. If one is not available and a power supply is frequently needed (such as for regular end-of-term social events, maintenance etc.) an exterior mounted supply point should be installed. An acceptable alternative is to use equipment that operates at a reduced voltage such as that supplied by a

transformer with an output that is centre tapped to earth (this halves the voltage between a live wire and earth). For very infrequent and one-off use out of doors, as a minimum users **MUST** use a portable RCD device. This is only acceptable as a temporary measure.

Type	Good points	Common problems
<p>Multiblock adaptors</p> 		<p>'Multiblock' adaptors can fail or become loose in the socket, causing overheating.</p> <p>The use of 'multiblock' adaptors is not permitted in UoR. They should be removed if discovered.</p>
<p>Single extension leads</p> 	<p>Used to get power to a part of the room where there is no existing outlet.</p>	<p>Very simple system but the weak point is the cable. It is susceptible to damage and is a trip hazard. Never plug a 2nd extension or a 3 way multiblock adaptor into the end. This would increase the resistance and the possibility of overheating, before the fuse blows.</p>
<p>Multi gang bar extension leads</p> 	<p>Often used to extend the outlet point and increase the number of plugs that can be connected. They are often fused and are readily available at low cost.</p>	<p>They permit too many items to be plugged in and the single wall socket may be overloaded.</p> <p>When the fuse blows, the user may replace it with a larger capacity one, thereby increasing the load on the internal connection points.</p> <p>As above the cable is a weak point for damage.</p>
<p>Reel cable extension leads</p> 	<p>Used to provide power at longer ranges. They are very useful for providing power in rooms where there is no power i.e. lofts.</p>	<p>They are often not fully unreeled during use – this can cause the cable to overheat.</p> <p>They are often taken outdoors with the added problems of water and risk of damage.</p>
<p>Built-in RCD cable extension leads</p> 	<p>These are often cable reel extensions designed for outdoor use. An excellent choice for outdoor work - the RCD device provides a measure of safety in the event of damage or water ingress.</p>	<p>There are some types that have the RCD at the reel end instead of at the plug end. The reel end types do not provide protection if the cable of the extension reel is damaged. The preferred type is the one with the plug RCD.</p>