Overload and Undersized Conductor

Insufficient copper in the conductor is the easiest method of reducing the cost of a cable but this significantly increases the risks of damage to equipment and even lowers fire safety in a building. Following on from the video (Fake Britain) that you have just seen, we are about to illustrate further what happens when a cable is installed which is undersized (either over resistance or the wrong conductor size).

Using the Thermal Imaging Camera, it can be demonstrated how hot the cables get during loading. We have two 6mm² conductors and one 4mm² conductor set up in our rig which we will use to simulate an overload on the 4mm².

Each cable is loaded with the same current.

The thermal imaging camera shows clearly which cable gets hottest. This example is illustrative of cable that Atlas Kablo had imported into the country, which was marked one size, but which in fact was a full size smaller.

We can further demonstrate by calculation what happens to the conductor temperature when we apply the maximum rating of the 6mm²cable to a 4mm²:

6491X (Installed in Conduit)

Size	Standard Rating	Max Temperature	Increased Rating	Temperature
4mm²	28A	70°C	36A	96°C
6mm²	36A	70°C		

6491B/FP100 (Installed in Conduit)

Size	Standard Rating	Max Temperature	Increased Rating	Temperature
4mm²	37A	90°C	48A	131°C
6mm²	48A	90°C		

If a cable is run in excess of its design load, it will get hot which will damage the cable and may also damage the connected equipment and accessories. It will also prematurely age the insulation materials, which will lead to a reduction in the cable design life. More importantly still, it will greatly increase the risk of a fire.

Prysmian cable design life is 25 years for a cable that has been correctly sized, selected and installed. For such an investment, we believe it would be prudent to install a product you can rely on that fully complies with the relevant British and International standards.

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