

Direct Buried & Ducted Current Rating Differences between BS7671 and Prysmian for Low Voltage Armoured Cables

Prysmian are often asked why their published direct buried and ducted current ratings for low voltage armoured cables are significantly different to those published in BS7671, The Wiring Regulations.

In both instances, the ratings are derived from calculation methods outlined in **IEC60287**. BS7671 publishes ratings taken from the harmonised document, **HD 60364-5-52**. Prysmian publishes ratings from the **ERA 69-30** series of publications. However, the calculated ERA 69-30 current ratings are significantly higher than those published, in BS7671/HD 63364-5-52.

HD 60364-5-52 and therefore BS7671 uses a different set of base conditions on which to calculate the current ratings for armoured cables. These are laid out below:

- 1) **Ambient Temperature** - the ambient temperature for the soil in HD 60364-5-52 is **20°C**. This is 5 °C higher than the base temperature used in ERA publication 69-30, which uses **15°C**. This higher ambient temperature will therefore derate the current rating of the cable.
- 2) **Soil Resistivity** - the Soil resistivity used in HD 60364-5-52 is a higher value of **2.5 K.m/W**. This is a particularly poor value and would be typical of perhaps a drier, more arid soil such as that found in countries near to the Mediterranean. The ERA 69-30 series uses a value of **1.2 K.m/W** which can be considered a more typical value for many parts of the UK, where the soil is considerably moister. Again the difference in these two values leads to a significant derating to the current rating of the buried cable.
- 3) **Installation Depth** – the installation depth used in HD 60364-5-52 for the base ratings for buried cables is taken as **700mm**. The ERA 69-30 publications use a shallower depth of **500mm**. This shallower depth again improves the current rating.
- 4) **Ducted/Non-ducted Installations** - no distinction is made between cables buried direct in the ground and those that are buried in ducts in the ground in HD 60364-5-52. The ERA series of publications calculates out the two installation methods separately. Cables buried in ducts will have a lower current rating than those buried direct in ground. Since HD 60364-5-52 makes no distinction between the two, it must use the current rating for the worst scenario, that of ducts in the ground.

Prysmian's advice to customers is, that if good installation practice is followed - installing the cable at 500mm and using good soil back fill which is suitably compacted (to minimise air voids), there is no reason why the ERA current ratings for armoured cables cannot be used. This assumes such installations are in the UK.

If soil conditions are unknown, consultation should be with a third party, who can either advise/undertake specific soil analysis for your installation.