

Answer:

As you may have guessed, no, this is not an acceptable solution. The more interesting part here is understanding the why.

Household cable is different from marine cable in several ways, as a result of the vastly different environments in which they are intended to operate. First and foremost is the construction of the conductor. While typically both of copper, the household cable is of solid construction, while the marine cable is of a braided construction where many small diameter cables are bundled together to provide the required cross sectional area. The solid conductor is sensitive to cracking and fatigue failure when subject to vibration, especially at terminations. Try bending the copper core back and forth a few times and you will see that it will quickly break. The stranded copper is much more resistant to cyclic and vibrational loading, and thus less likely to fail in these conditions. In addition, quality boat cable is tinned, i.e. the copper strands are coated with tin. While not required under the standards, tinned wire offers much greater corrosion resistance in the high humidity environments of our boats and is strongly recommended.

The second significant element of difference is the material used for the sheathing. Marine cable is impervious to water absorption and to oil which are essential in the marine environment.

Transport Canada permits a number of cable types, as are listed in Section 8.7.1 of the Construction Standards for Small Vessels, TP1332e. However these cable types are not typical household types. For certainty and for simplicity, the use of UL1426 boat cable is strongly recommended.

Sizing of the conductors must consider both ampacity (safe current levels for heating considerations) and also voltage drop. Voltage drops on 12V circuits are surprisingly large, and typically represent the limiting case for conductor sizing in most applications. The above noted standard provides more information on these considerations. Ensuring that the cable is of sufficient size is essential both for fire safety and to ensure proper operation of equipment connected to the cable. We would strongly recommend that you seek out a qualified *marine* electrical technician to advise on questions of sizing, as well as other considerations such as over-current protection, grounding, etc. ABYC electrical certification is a good indicator of suitable qualification.

Finally, conductor colour is also mandated by Transport Canada. For DC circuits, ungrounded (positive) conductors must be red, while grounded (negative) conductors must be yellow or black. Yellow is the preferred option as this avoids confusion with the black ungrounded (positive) conductors in AC circuits. Grounding conductors may be green or green with yellow stripe.