When to Specify a CablePro® Fuse and How to Use It to Improve Design

Where to Apply CablePro® Fuse

The Littelfuse CablePro® fuse (Fig. 1) was designed to replace both the fusible link in a harness or high current fuses with a holder, and the whole high-current cable to which it is attached. It can be used to replace any cable where high current protection is needed, but there are limited locations for the fuse and holder.

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Why Use CablePro® Fuse

Most of the reasons for using the CablePro® fuse and cable can be related to cost, but some of those reasons may not be immediately obvious; for example, with CablePro® fuse it is often possible to use thinner wire than would otherwise be needed. With CablePro® fuse there is no concern about high contact resistance from poor crimping or low-quality or poorly-assembled terminals. CablePro® fuse can be routed directly, with no fuseholder and nothing to be mounted.

Some companies use CablePro® fuse itself as the main battery cable; wiring it into their harnesses just like a standard battery cable. In many cases the fuse element is hidden in the conduit. Because the fuse cannot be replaced, there is no reason for the black housing to be exposed.

CablePro® Fuse Versus the Alternatives

The main alternatives to CablePro are a conventional fusible link, a Littelfuse MEGA® fuse and MIDI® fuse /BF1 fuse, or a Littelfuse BF Inline fuse.

CablePro® fuse's biggest advantage over a conventional fusible link is safety: with 1000A overload a fusible link can burst into flame. CablePro® fuse will not.

CablePro® fuse has two main advantages over the Littelfuse MEGA® fuse and MIDI® fuse /BF1 fuse: First off it has a better I2T rating, which means that it will handle inrush currents better. Opening gates are shown in the table below.

Percent of rating	Opening time	
	Minimum	Maximum
100	100 hrs	-
135	120 s	1800 s
200	10 s	300 s
350	1 s	15 s
600	0.3 s	5 s

On the practical side, the combination CablePro® fuse and cable is just one piece, and is installed and used as if it were a simple piece of wire. MEGA® fuse and MIDI® fuse /BF1® fuse requires 15 pieces — the fuse itself and all the hardware that goes with it — that must be purchased, stocked, and assembled for use.

While there tend to be regional differences in the use of CablePro® fuse and BF Inline fuse — CablePro® fuse finds its greatest use in North America and Asia, while the BF Inline fuse is used mostly in Europe — there are technical differences as well. Like the MEGA® fuse and MIDI® fuse /BF1 fuse, the BF Inline fuse is heavy; the designer must find a place or location to fasten the BF Inline fuse housing to the car body; with CablePro® fuse that is not needed: it goes from point A to point B directly. This can lead to shorter cable runs, reducing circuit resistance, weight, and material costs.

Perhaps more importantly, the BF Inline fuse must be crimped to its cable by the user. Not only is this an extra assembly step, but if the crimping is not done properly it can lead to high contact resistance, which can cause fuse failure or even a fire hazard.

Application Considerations

Unlike the BF Inline fuse, which is specified in terms of the wire size with which it will be used, the CablePro® fuse is selected in terms of current, similar to MEGA® fuse and MIDI® fuse /BF1 fuse. It is available with ratings from 60 to 200A.

The CablePro® fuse is ordered by length; it has a 5-inch (127 mm) recommended minimum length; anything shorter requires a special order. The absolute minimum length available is 3.5 inches (90 mm).

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It is preferable that the fuse element be located in the lowest temperature location possible, but it should be located away from direct splashing. In other cases, the cable can be routed anywhere a battery cable would be routed.

Protecting Against the Elements

Areas that may create a problem include directly under the vehicle body, in a wheel well, near the windshield, or anywhere salt may contact the fuse housing. If CablePro® fuse must be mounted where it will be exposed to splashed water it should be covered with heat shrink tube, as shown in Fig. 2. Heat shrink has been validated and proven to work, passing all overloads testing after a 100 percent IN, 100 hour life test and a 500 hour powered salt spray test.

Example of the use of heat shrink tubing on CablePro® fuse.

Heat shrink is typically done by the customer, because they have better access to heat shrink materials and equipment than Littelfuse. Littelfuse can provide heat shrink recommendations and some evaluation testing.

Standard Sizes

The Littelfuse CablePro® fuse is available in four standard cable sizes: 19 mm2 (SAE 4 gauge); 13 mm2 (SAE 6 gauge); 8 mm2 (SAE 8 gauge) and 5 mm2 (SAE 10 gauge). The maximum available cable size for CablePro is 4 AWG.

The standard maximum temperature for CablePro® fuse is 125°C, but some versions are available with 150°C rating.