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ESA Electrical Safety Mining Services Group **Tech Brief**

Use of Shielded Portable Power Cables as a permanent wiring method in Ontario Mines

What's the Issue?

PPC cable offers some significant benefits over traditional wiring methods in underground mines as a permanent wiring method. Some of its benefits are:

- Higher ampacities per circular mil of copper than permitted for Teck cable;
- Lower weight for equivalent ampacity – a health and safety issue in the underground environment.
- Elimination of steel/aluminum armoured (Teck90) cable – aluminum is not a suitable armour material in some mines and steel armour equates to cost and delivery premiums.

OESC Rule 4-038 already recognizes the use and application of PPC for permanent installations short of its use for fixed wiring of structures. PPC falls into this application and is further supported by OESC 2-034 – Use of Approved Equipment: "approved electrical equipment of a kind or type and rating approved for the specific purpose for which it is to be employed."

BACKGROUND:

As stated in the Scope of CAN/CSA C22.2 No. 96-03, Portable

Power Cables, the standard covers "cables normally used in applications where the cables are subject to frequent flexing and where installation is in accordance with CAN/CSA-M421 and/or the Canadian Electrical Code, Part I."

Shielded Portable Power Cable

What is it?

Shielded portable power cable is a specific type of portable power cable intended for use as permanent or semi-permanent installations under CAN/CSA M421, Use of Electricity in Mines and the Canadian Electrical Code, Part 1.

Constructed under the requirements of the CAN/CSA C22.2 No. 96-03 Standard, shielded portable power cable incorporates proven ruggedness with the added benefits of higher ampacity ratings and ease of installation.

Shielded portable power cable is not intended to replace specialty cables such as "riser Teck" for shaft cables or MPF; it is available in various constructions meeting the requirements of the Standard: Shielded or non-shielded, with ground conductor monitoring or not, with CPE or PVC jacket, to name a few.

Conditions of Use

Both the Ontario Ministry of Labour and the Electrical Safety Authority have agreed to the use of shielded portable power cable as a permanent wiring method, based on the following minimum requirements:

- The cable must be shielded, and
- Ground fault protection be provided as prescribed by M421-93 clause 3.5.5, and
- Incorporate ground conductor monitoring as prescribed by M421-93 clause 3.5.6, and
- Cable support as prescribed by OESC 12-510, and
- Not to exceed the manufacturer's general installation specifications., i.e. vertical strength, etc.

