CHAMPION FIBERGLASS®

WHITE PAPER

Champion Fiberglass & Radix Join Forces to Provide a Two-hour, Fire-rated Safety Solution

Fire alarm systems require heat- and flame-resistant components to protect project stakeholders from future safety risk and liability exposure. So when UL noted compatibility issues within its UL 2196 designation, it prompted discovery of new solutions. It began when, several years ago, UL found issues when classified fire-resistive cables were used in electrical circuit protective systems where zinc was used as in interior coating in steel conduits, raceways and other system components. Specifically, at high temperatures the zinc coating interacted with the copper conductor creating a brass alloy that melted at a lower temperature than the copper conductors alone, thereby affecting the integrity of the electrical system. The presence of zinc compromised the electrical circuit protective systems and caused them to not conform to UL2196. As a result, cable manufacturers were no longer authorized to place the UL trademark on these products: UL-classified fire-resistive cable (FHJR), ULC-listed fire-resistive cable (FHJRC) and UL-listed cable with "CI" suffix (circuit integrity).

UL2196 Cable Performance Testing & Systems Impacted

The UL2196 test is designed to evaluate the performance of electrical cables in severe fire events. Critical circuits need to be operational in the case of a fire event. UL2196 addresses this issue with testing designed to evaluate the functionality of electrical circuits during a two-hour period of fire exposure and afterwards following exposure to a hose stream.

Project systems impacted include 300V fire alarm systems, transit and tunnels, area of refuge systems, two-way communications, smoke management systems, mass notification systems and electrical equipment rooms.

The Fiberglass Advantage

The demand for fiberglass conduit in the United States alone has been growing significantly over the last two decades. As demand continues to grow to serve the long-term interests of project owners and engineers, it made sense to investigate the use of high-temperature fiberglass phenolic conduit as a solution to the zinc compatibility issue that plagues rigid metal conduit. Recently, Radix and Champion Fiberglass partnered to examine and develop a cost-effective solution for 300V fire alarm cables that would continue to function while exposed to the severe fire requirements of UL2196.

Champion Flame Shield® Phenolic Conduit doesn't have the problematic zinc compatibility issues of rigid steel conduit. It contains the zero-smoke and zero-halogen, high-temperature physical properties that enable it and Radix Duralife II Dual Rated CI/CIC Cable to continue functioning during the UL2196 cable performance testing.

Tests were conducted by UL in 2019 resulting in the organization issuing an FHIT/FHIT7 28C listing. This listing is a system compatibility UL listing which illustrates that both products, when installed together as outlined in the UL FHIT listing, continued functioning during the entire UL2196 test.

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Impact of FHIT/FHIT7 28C Listing on Project Economics

The Radix Duralife Fire Resistive Cable and Champion Flame Shield® Phenolic Conduit combination influences project economics in the following ways:

- It ensures the facility or infrastructure will perform as designed long term.
- It allows engineers to draft more flexible, efficient and cost-effective designs.
- It streamlines the project's implementation and ability to meet milestones.
- It protects project stakeholders from future safety risk and liability exposure.
- It meets one-hour tenability per NFPA130 and NFPA502.

These points illustrate the positive economic and operational impact that choosing the right cable and conduit combination for your two-hour, fire-resistive electrical circuit protective systems will have.