Ground Line and Minimum Cover Cable system primary Distribution lines.

Product Selling Points

The traditional primary distribution system design and construction does not meet the current challenges of operating an electric utility system safely and reliably.

- The overhead distribution system continues to present fire safety risks as it relates to climate change (extreme or unprecedented wind levels, drought, increased tree mortality rate, beetle infestation, temperature rise, etc.).
- The underground distribution system, which would be the preferred choice in addressing these challenges, is not as effective due to the complexity, time, and execution cost.

Rebuilding the electric system in a cost-effective manner to achieve an arc free system is challenging, especially in **rural, remote environmentally impacted** or even inaccessible areas.

Product Overview

The Ground Level Primary Distribution System (GLDS) and Minimum Cover Cable system (MCC) are comprised of a cable in conduit (CIC) system, cable railing, fire/heat resilient fill element and cover. This solution offers an integrated option by including communication (fiber cable) alongside of the primary lines. The GLDS is designed for applications above-grade and the MCC is designed for situations requiring below-grade solutions.

The GLDS:

- Provides multi-layer protection from energized conductor to ensure public safety.
- Eliminates risk of ignition due to external factors such **high winds, drought, vegetation contact, falling trees, etc.**
- Has much lower cost than undergrounding since the system does not require trenching.
- Can be applied to eliminate the overhead system or used as hybrid to address specific risks.

Safety

The GLDS is designed to be used in areas with hard ground, rock, granite, etc. where traditional trenching would be cost prohibitive and time consuming. This concept is for remote locations with minimal to no pedestrian traffic. This system is designed for high traffic loading, so it can be driven over by fire truck or any other vehicle.

The MCC system is designed to be used in areas where underground is taking place, including areas with crossing signs, crosswalks, pedestrian traffic etc. This system is shallow buried by utilizing a cable rail system and geopolymer fill (which is hard and fireproof). This concept would be compliant with ADA requirements.

Both systems have the following characteristics:

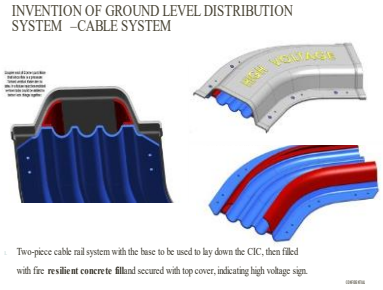
- There is an outer shell made of TPO (Fully insulated material around our system - the cable rail system)
- The cable rail system is marked with High Voltage signs every 3'. The lines are Marked with reflective marking to ensure visibility.
- The cable rail system is filled with minimum of 2" of geopolymer concrete.
- The CIC is another insulated type of conduit containing the fully insulated cable. The level of safety is such that the cable can be safely touched without a risk of electrocution since it is fully insulated.
- The lines are always running parallel to the roadway and are not crossing lanes in the path of foot traffic.
- The GLDS is rated for high traffic and can be driven over, it is environmentally friendly, and ADA does not apply to remote or forested areas. Nevertheless, ADA requirements can be met with our MCC system.

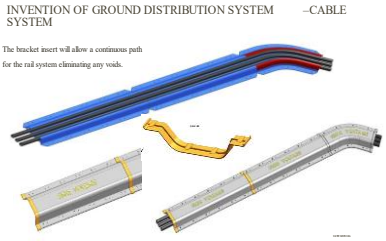
Product Specifics

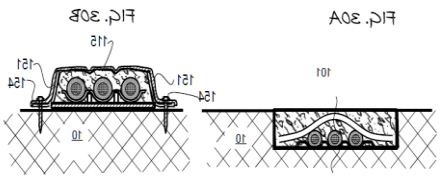
Cable Rail System:

The Cable Rail system is made of **Fire-Retardant Thermoplastic Polyolefins** (TPO). **Thermoplastic olefin** is a chemical substance that is composed of a high molecular weight polyethylene, rubber, and a reinforcing filler. FR TPO compounds are resin blends of polypropylene (PP) and un-crosslinked Ethylene Propylene Diene Monomer (EPDM) rubber and polyethylene. They are characterized by high impact resistance, low density, and good chemical resistance. **FR TPO is similar to plastic** due to their differences in compounding. TPO is recyclable material, which makes them "green", environmentally friendly.

STR2030			
Properties	Test Method	Unit	STR2030
Melt Flow Rate (230°C/2.16kG)	ISO 1133	g/10 min	1
Density	ISO 1183	g/cm^3	1.28
Tensile Stress at Yield, 50 mm/min	ISO 527-1,2	MPa	17
Flexural Modulus, 2 mm/min	ISO 178	MPa	1,800
HDT at .450 kPa	ISO 75	°C	90
MA Impact Peak Force Energy, 23C 2.2 m/s	ISO 180	kJ/m^2	18
MA Fail Mode, +23°C, 2.2 m/s	ISO 180	kJ/m^2	Ductile
Flammability, UL 94, V-0, 1.5MM	Pass/fail	%	Pass



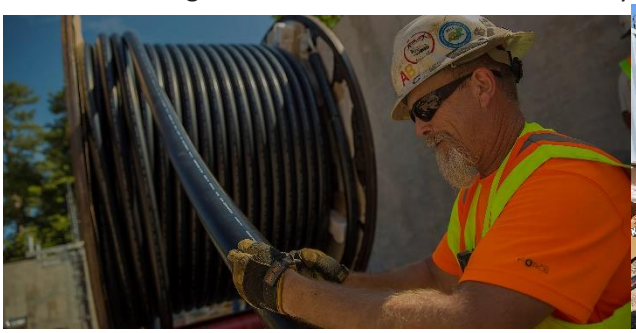
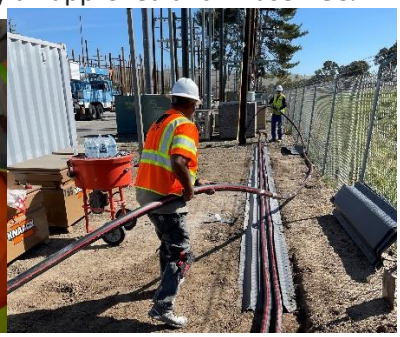




GL **MCC**

Cable in Conduit

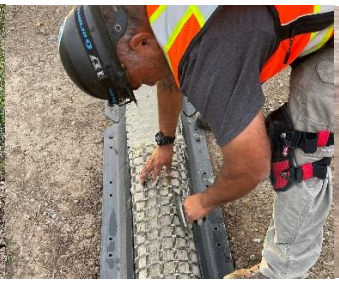
CIC is often chosen for its one-step installation and the high level of physical protection it provides wiring. CIC is electrical cable pre-installed in conduit tubing. Because it is pre-installed, time and labor involved in pulling the cable through the conduit is saved. CIC is already an approved and in-use PG&E material.

The Fill Material:

The Fill material is high density Geopolymer (made from recycled material, 100% environmentally friendly).

The patented GEOPOLY-THERM technology is based on the use of geopolymer binders. The fire resistive properties of the materials have been demonstrated in the maritime industry aboard vessels via collisions between civilian ships and ferries, and by experiences of the British Navy in the Falkland Islands and the American Navy in the Persian Gulf. The GEOPOLY-THERM technology provides a safe and proven method for fire resistant composite systems.


GEOPOLY-THERM technology offers:

- Excellent burn-through fire resistance
- No ignitability
- No flammability
- No combustion gases
- No toxicity
- No smoke emanation
- No heat release
- No combustive gas generation

This is a R&D project, we are requesting an exemplary pilot (with more to follow) in a remote location to learn about construction challenges, confirm the best tools, equipment, and methods for high yield deployment (efficiency, cost reduction). Additionally, we are hoping to finalize the design application criteria, work methods, and procedures. We believe this could be a great option for the right application, reducing the cost and time of reconstruction, and converting the overhead system to eliminate the risk electric conductor ignition.

Advantages of this System

- Reliability and availability of power as it relates to external factors such as **high winds or storms.**
- **Maintenance**
    - This system, like underground conduit, does not require any specific maintenance. However cyclic visual inspection could potentially be the same as our pad-mounted equipment (GO 165 – 3 Year inspection cycle) to ensure the integrity of the cable system is not compromised in any way.
- Eliminate or reduce cost in **vegetation management**.
- Eliminate the risk of tree/**root growth** into facilities (as experienced in underground systems)
- Eliminate the risk of **dig-ins,** as there will be a clear indication of the presence of high-power lines.
- Environmental Hazard management to support **leach field challenges and methane gases** below ground (challenge in Paradise electric system rebuild)
- Minimal elevation from the ground, provided by the GLDS, will allow **vehicle access** (e.g., Emergency response, Fire trucks, etc..). The MCC system provides no form of impediment to vehicle access.
- Potential Application in limited space **Utility Easements** (PUE) challenges
- Special Application and solution for agricultural customers (e.g., organic farms and addressing fire risk in wineries without disturbing operations)