



# How Data Centers Benefit from Fiberglass Conduit Elbows

Protection of Cables and Wires = Security of Mission-Critical Data and Processes

## Abstract

Data centers are vital elements of our modern world, securely facilitating delivery of the most valued commodity today, our data. They house assorted bandwidth-intensive devices, like blade servers, storage systems, virtualization appliances and backup devices connected by a significant volume of networked cabling and electrical wiring.

Characteristics like lack of burn-through, low coefficient of friction, and fault resistance make fiberglass conduit elbows an ideal solution to protect data center infrastructure. Moreover, fiberglass conduit is cost effective, lighter, easier to handle and transport, and less labor intensive to install than traditional alternatives.

## Everyday Digital

Our world is increasingly digital with bits and bytes converging with real life tasks constantly. As reliance on the Internet of Things (IoT) surges, activities are increasingly dependent on data centers as they handle mission-critical data and processes for business, government and organizations.

In designing data centers, the goal is to preserve and secure technology infrastructure while addressing future scalability. Electrical considerations like wire, cable, conduit and planning are fundamental components of data center projects, and some of the more expensive aspects. On Backblaze.com, Roderick Bauer notes, "Electrical power usually represents the largest cost in a data center."

Cost containment protection of the massive amount of wire and cable from elbow burn-through during installation and faults after installation is essential to preserve investment, so electrical conduit deserves careful consideration. Securing data center components begins from the ground up in facility design. Best practices dictate durable, cost-efficient fiberglass electrical conduit elbows.

## It's What's Underneath That Counts

Electrical conduit is typically buried in trenches, and sometimes the conduit is placed in concrete banks that shield the wire and cable from elements like weather, fire, even animals.

Conduit elbows are integral to bringing subterranean wire and cable to surface and upper levels of data centers. As data center design maximizes server space, fiberglass conduit elbows must support an increasing amount of heavy cable while minimizing burn-through for this dense environment.

## Fiberglass Elbows Offer Next-level Protection for Data Centers

Of all conduit products available, fiberglass conduit elbows offer strategic advantages in data center builds because of lack of burn-through, low coefficient of friction, and fault resistance to properly protect

data center assets. And fiberglass conduit's corrosion resistance and cost savings add to its appeal. Here's why fiberglass conduit is the best solution to conserve data center assets:

- **Burn-through does not occur with fiberglass conduit elbows.** Elbow burn-through compromises the conduit and cable system integrity and often results in increased labor and material costs. Fiberglass conduit elbows eliminate burn-through leaving strong, durable, conduit that protects data center cables.
- **Fiberglass conduit elbows possess one of the lowest coefficients of friction of any conduit system.** Fiberglass conduit's coefficient of friction measures .38 compared to .55 for PVC-coated steel and galvanized rigid steel and .90 for SCH 40 and SCH 80 PVC. Fiberglass conduit's low coefficient of friction allows for longer conduit runs with fewer pull boxes. This enables a faster, smoother pull with less labor time, cost and risk. Additionally, cable pulling lubricants have no detrimental effects on fiberglass conduit.
- **Fault resistance in fiberglass conduit elbows creates long-term protection for data centers.** Continuous power is necessary to sustain data center operation. Fault resistance ensures cable will not melt the fiberglass conduit or weld the cable to the conduit, allowing wire to be easily pulled through, without a costly repair to the conduit.

### Cost Savings of Fiberglass Conduit Elbows Appeal to Data Center Designers

Because of its light weight and easy installation, the cost savings associated with the installation of fiberglass conduit is significant. Lighter weight suggests easier and less expensive handling and transport in some cases. Additionally, installation requires fewer labor hours as outlined in the NECA manual of labor units (MLU), so labor costs are lower. Due to its durability and corrosion resistance, fiberglass conduit lasts longer, so the overall cost of installed fiberglass conduit over time is typically less than other conduit products on the market.

	EPOXY FIBERGLASS	PVC SCH 40	PVC SCH 80	GALVANIZED RIGID STEEL	PVC-COATED STEEL	ALUMINUM
<b>Burn-through (Cable Pull)</b> Fiberglass conduit is an excellent material for avoiding "burn-through" when pulling cable.	No	Yes	Yes	No	No	No
<b>Coefficient of Friction</b> Using PVC Jacketed Cable Fiberglass conduit offers one of the lowest coefficients of friction available today for conduit systems. It is completely resistant to any of the current pulling lubricants' corrosive properties.	0.38	0.90	0.90	0.55	0.55	0.25
<b>Cable Fault</b> Fiberglass conduit will not melt or weld the wire to the inside of the conduit under fault conditions as can happen with PVC, steel and aluminum conduit.	Not Affected	Melt/ Fuse	Melt/ Fuse	Weld	Weld	Weld

### Protect Hi-Tech with an Innovative Conduit Solution

Technology companies recognize the innovation behind fiberglass conduit as a solution that protects their cable and wire, secures data and preserves data center investment. In-the-know engineers, project owners and contractors depend on fiberglass elbows' ability to withstand cable burn-through, tolerate electrical faults and guard against underground corrosion. Data center designers appreciate the cost efficiency of the product and its installation. For data centers, fiberglass elbows offer a durable, cost-efficient product companies can trust to safeguard assets.

## TOUGH. STRONG. PROTECTIVE.

### PROTECTING DATA CENTERS FROM THE GROUND UP



**In data centers, Champion Fiberglass elbows preserve infrastructure that safeguards mission-critical data and processes.**

Champion Fiberglass understands the distinct challenges of data centers. Get a Champion on your side - and durable, lightweight conduit elbows that:

- Eliminate burn-through, which means no damage to conduit so no costly repairs.
- Resist faults and prevent wire melt for easy pull-through.

HOW MUCH COULD YOUR DATA CENTER PROJECT SAVE?

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