The background of the entire page is a photograph of the Golden Gate Bridge in San Francisco, California. The bridge's iconic orange-red towers and suspension cables are visible against a blue sky with scattered white clouds. The water of the bay is visible below the bridge.

ELECTRICAL CONDUIT BUYER'S GUIDE

Discover the highest performing
electrical conduit for your project
by application

There are many types of electrical conduit to choose from for industrial construction projects. There's certainly not a one-size-fits-all solution. The best conduit for a project depends on the application.

Applications vary uniquely in ways such as indoor or outdoor, wet or dry, degree of corrosion, and installation. We've broken down applications by project challenges, conduit standards, and price to determine the best electrical conduit for the job. Find out if your project can benefit from an alternative type of electrical conduit.



WHAT TYPE OF ELECTRICAL CONDUIT IS BEST FOR YOUR JOB?

It depends. The best conduit for your project depends on the application. It will also depend on the type of installation (above ground or below ground), building codes, and environmental factors like corrosion, UV exposure, weather, and safety concerns such as fire.

There are many types of conduit – metallic or nonmetallic, rigid or PVC-coated – and each has specific properties that make them ideal for a given situation.

Some of the more common rigid electrical conduit substrates used in industrial construction include:

PVC SCH 40 & SCH 80

PVC conduit is subject to “burn-through” and releases toxic gases when burning. It is currently experiencing high prices and delivery delays due to a PVC shortage.

PVC Considerations:

- > More costly (on sizes 2” and above) and PVC SCH 40 & SCH 80 conduit is heavier than fiberglass conduit, so installation requires more man/hours
- > Long lead times
- > Releases toxins when burning
- > Heavier weight increases man/hours required for installation

PVC-coated steel

PVC-coated steel considerations:

- > Significantly more costly and PVC-coated steel conduit is much heavier than fiberglass conduit, so installation requires more man/hours
- > Long lead times
- > Releases toxins when burning
- > Poor UV resistance makes PVC-coated steel a poor choice in outdoor environments

Galvanized Rigid Conduit (GRC)

This conduit is made from steel and provides impact resistance. It is used in industrial and commercial applications. It is long-time industry standard but very heavy and highly susceptible to corrosion.

GRC Considerations:

- > Connections are threaded, and conduit is extremely heavy so installation requires more man/hours
- > Prone to corrosion
- > Requires grounding
- > The interior zinc coating makes it not suitable for tunnel installations where UL 2196 is required.

Fiberglass Conduit (RTRC)

This electrical conduit is lightweight and durable, cost-competitive, and readily available. It is approved for use across many applications including data centers, utilities, and wastewater treatment.

Fiberglass Conduit Considerations:

- > Lightweight
- > Excellent corrosion resistance
- > Faster installation per NECA Manual of Labor Rates



IDENTIFYING THE BEST CONDUIT BY PROJECT

Among the different types of electrical conduit, the electroindustry has identified standards by application. Let's dive deeper into common applications and the electrical conduit that best suits these environments. These include industrial applications in projects such as transportation, data centers, utilities, and wastewater treatment.



BRIDGES

According to the American Society of Structural Engineers' (ASCE) 2017 Infrastructure Report Card, the U.S. has more than 600,000 bridges, almost four in 10 of which are 50 years or older. The organization estimates bridge rehabilitation needs at \$123 billion.

Light weight is important not only for installation, which it makes easier, it also reduces the bridge dead load. Electrical conduit on bridges must be corrosion-resistant to withstand salt on roads as well as handle weather considerations like sun exposure, wind and rain. There is also a need for highly innovative products as these conduits will be used to carry fiber optic cables.

PROJECT CHALLENGES



Installation



Salt on roads



Weathering



Cold winters



Hot summers depending on location

Application Requirements: Light weight, ease of installation, temperature range

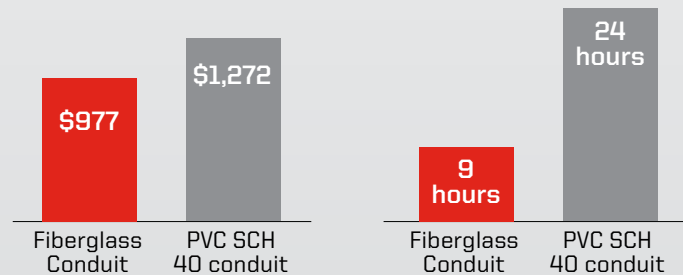
Electrical Conduit Typically Considered: PVC

Materials Cost Comparison

(per 100 ft 6" MW Conduit)

Installation Hours

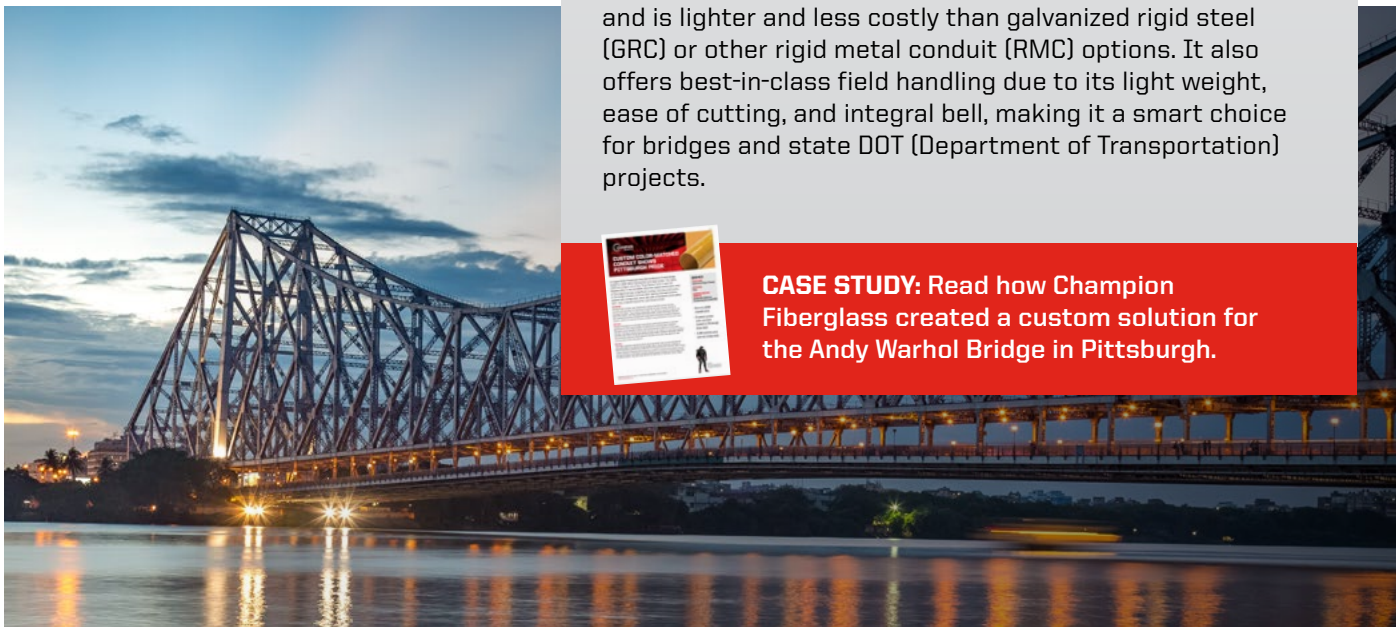
(Per NECA Manual of Labor Units)



Based on prices as of 1/11/22.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit keeps projects on budget, lowers manpower costs, and is lighter and less costly than galvanized rigid steel (GRC) or other rigid metal conduit (RMC) options. It also offers best-in-class field handling due to its light weight, ease of cutting, and integral bell, making it a smart choice for bridges and state DOT (Department of Transportation) projects.






CASE STUDY: Read how Champion Fiberglass created a custom solution for the Andy Warhol Bridge in Pittsburgh.

TUNNELS

Infrastructure spending is growing not only for bridges but tunnels too. That means important enhancements to roadway and transit tunnels are in the works. Many times upgrades involve replacement of aging galvanized rigid steel conduit in transit and roadway tunnels.

PROJECT CHALLENGES

-  Conduit must meet requirements that keep commuters safe
-  Installation
-  Product Availability

Application Requirements: Safety, no toxicity

Electrical Conduit Typically Considered: PVC or GRC

Materials Cost Comparison

(per 100 ft 6" MW Conduit)

Fiberglass Conduit	\$977
PVC SCH 40 conduit	\$1,272
GRC conduit	\$7,188
PVC-coated steel	\$8,595

Based on prices as of 1/11/22.

Installation Hours

(Per NECA Manual of Labor Units)

Fiberglass Conduit	9 hours
PVC SCH 40 conduit	24 hours
GRC conduit	48 hours
PVC-coated steel	60 hours

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is lighter and less costly than galvanized rigid steel conduit (GRC), and does not have the toxicity and halogens of PVC SCH 40 or PVC SCH 80. Fiberglass conduit offers a safe alternative that is UL 2196 approved.



CASE STUDY: Read how Champion Fiberglass replaced aging conduit to create a safe tunnel environment for commuters.



DATA CENTERS

While data center construction might have slowed a bit in 2020 due to pandemic-related worker and product shortages, our reliance on digital technology has it roaring back presently. Fiberglass conduit elbows are commonly used in data center projects with other types of conduit, like PVC. With product shortages in PVC, many project managers are considering other options for straight sections.

PROJECT CHALLENGES



Wire replacement



Wire pulling



Conduit repairs due to burn-through



Product availability

Application Requirements: low coefficient of friction, no burn-through elbows

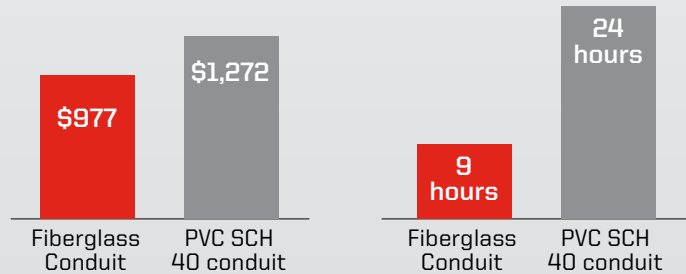
Electrical Conduit Typically Considered: PVC

Materials Cost Comparison

(per 100 ft 6" MW Conduit)

Installation Hours

(Per NECA Manual of Labor Units)



Based on prices as of 1/11/22.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is resistant to pulling lubricants and its low coefficient of friction allows for long pulls with fewer pull boxes. Also, its no burn-through quality eliminates repairs plus product availability makes straight sections and elbows appealing for data centers.



CASE STUDY: Read how Champion Fiberglass conduit protects important data center components.







UTILITIES

The United States power grid delivers \$400 billion of electricity across seven million miles of transmission and distribution lines. It is a system comprised of generating plants, wires, transformers, and substations for homes and businesses that are a part of the world's largest economy.

Electrical conduit, used to protect wire and cable from generating facilities through distribution to the end-user, is a crucial piece of the power grid. Utility projects have many of the same project challenges as data centers.

PROJECT CHALLENGES

-  Buried installation
-  Wire replacement
-  Wire pulling
-  Conduit repairs due to burn-through

Application Requirements: fault resistance, low coefficient of friction, no burn-through elbows

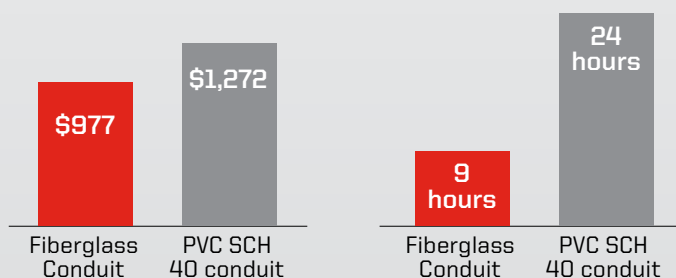
Electrical Conduit Typically Considered: PVC

Materials Cost Comparison

(per 100 ft 6" MW Conduit)

Installation Hours

(Per NECA Manual of Labor Units)



Based on prices as of 1/11/22.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is resistant to pulling lubricants, low coefficient of friction allows for long pulls with fewer pull boxes, no burn through eliminates repairs, fault resistance means wire repairs can be made easily.



CASE STUDY: Read how Champion Fiberglass helped a power plant customer save \$3 million.



WASTEWATER TREATMENT PLANTS

In the US, more than 14,000 wastewater treatment plants provide the critical infrastructure required to maintain public health. Few industrial environments are more caustic or damp than wastewater treatment facilities. Harsh chemicals, extreme temperatures, and aging infrastructure require strong, durable conduit systems. At \$36 billion annually, the cost of corrosion related to water and sewer systems is significant.

PROJECT CHALLENGES



Caustic environments prone to corrosion



UV Exposure



Product Availability

Application Requirements: Ability to withstand corrosion

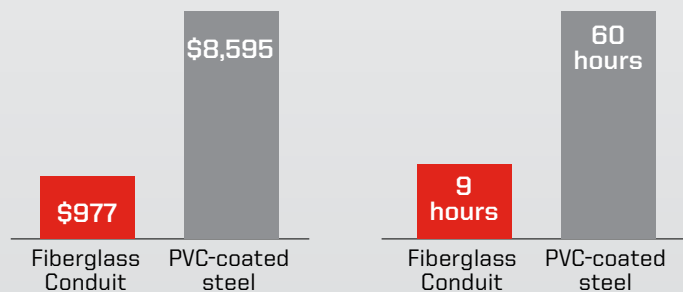
Electrical Conduit Typically Considered: PVC-coated steel

Materials Cost Comparison

(per 100 ft 6" MW Conduit)

Installation Hours

(Per NECA Manual of Labor Units)



Based on prices as of 1/11/22.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is resistant to many chemicals. It is also UV stable for outdoor environments.



CASE STUDY: Read how Champion Fiberglass created a custom solution with 8000 feet of corrosion-resistant product to replace degrading PVC-coated steel conduit.



INSTALLATION CONSIDERATIONS & PRODUCT AVAILABILITY



Installation varies by application and project. Are there special challenges or considerations for your project? Common considerations include weight, cutting and bonding procedures, joining systems, and hanger systems. Challenges include conduit availability, lead times, complexity, and joining systems.

Fiberglass conduit offers an [installation solution](#) with ease of cutting and an integral bell that allows for faster installation. Based on the [NECA Manual of Labor Units](#), most sizes of fiberglass conduit install faster than PVC, galvanized rigid steel, PVC-coated steel, and aluminum providing installation savings.

Additionally, extended support spans translate into more savings. Champion Fiberglass is the only fiberglass (RTRC) manufacturer to offer extended support spacing on a full complement of conduit sizes. The use of fewer struts and hangers increases savings.

Finally, some types of conduit, such as PVC, are experiencing shortages in supply. Fiberglass conduit is not subject to product shortages and rising prices of PVC. Short lead times keep projects on schedule with no delays.



CHOOSE THE RIGHT CONDUIT FOR YOUR JOB BY TAKING THE NEXT STEPS FOR PROJECT SUCCESS



GET AN ESTIMATE

See how fiberglass conduit compares in price to PVC SCH 40, PVC SCH 80, PVC-coated steel, GRC, EMT and aluminum with your project specs.

[GET AN ESTIMATE](#)



BIM/REVIT MODELS

BIM/Revit models help promote efficiency among all teams while collaborating on a project.

[GAIN ACCESS](#)



QUESTIONS?

Got specific questions about how our fiberglass conduit can benefit your projects?

[CONTACT US](#)



READY TO MOVE FORWARD ON A PROJECT?

Our manufacturer's rep network offers experience in helping engineers and contractors solve complex project challenges.

[FIND A REP](#)

