

Conduit Selection

Differences Between Above Ground and Below Ground Conduit

The difference between above ground and below ground conduit is in their relative fire resistance. Above ground conduit has fire resistance per UL 2515 and CSA C22.2 No. 2515 standards, meaning that the conduit will self-extinguish within 15 seconds after each of five successive flame applications per the UL 94 (vertical) flame test standard. Below ground conduit meets UL 94 (horizontal burn) requirements, which are less stringent than vertical burn requirements.

Above and below ground conduit share many other properties: dimensions, colors, physical and mechanical properties are the same. Because of its higher flame resistance, conduit that is manufactured and labeled for use in “above ground” applications is suitable and can be used for “below ground” applications as well.

Conduit Application Guidelines

The following recommendations must be verified by the contractor/installer and approved by the engineer of record. The information is strictly for use as a guideline and should be taken as a suggestion only.

Above Ground and Under Bridge

For above ground applications, we recommend that all conduit joints be bonded together with epoxy adhesive.

- The conduit types that have connections that require epoxy adhesive are Straight Socket and Tight Lock.
- These joining systems are available with IPS, ID and XW epoxy resin conduits.
- For above ground applications using phenolic resin conduits, all connections are Straight Socket type and require a high-temperature, fire-resistant adhesive to bond the conduit sections together.

It is recommended that the conduit diameter be based on the allowable wire fill section in this catalog. Determine the support span of your conduit by reviewing the support span section of this catalog. Champion Fiberglass has UL-Listed, NEC-compliant extended support span distances that exceed the charts shown in Article 355 of the NEC. A mid-span deflection of 5/8" (16 mm) should not be exceeded.

Encased in Concrete (EB quality)

For most concrete encasement applications, SW (Standard Wall) conduit is sufficient.

- Due to its high temperature rating (250°F), epoxy fiberglass conduit performs well when encased in concrete. (This recommendation may not apply for core boring applications.)

- The SW Interference Joint conduit can be used for this application.
- The Gasket Joint and Tight Lock Joint conduits can be used for this application but are not required.

Jack and Bore

Due to the possibility of high pressure caused by concrete, HW (Heavy Wall) or XW (Extra Heavy Wall) conduit should be used.

- The installing contractor must observe and apply proper industry-accepted standards and procedures when pumping the concrete into the core.
- If excessive pressures are reached, even HW or XW conduit may fail.
- The HW Interference Joint conduit can be used for this application.
- The Tight Lock Joint conduit can be used for this application.
- The Gasket Joint conduit is not recommended for this application. See trenchless applications on page 155 for more information.

Direct Buried (DB quality)

For direct buried applications that have deep trenches, special soil conditions, or high rates of soil compaction, HW conduit should be used.

- Applications that do not contain any of those conditions may use SW (Standard Wall) or MW (Medium Wall) conduit.
- The Gasket Joint and Tight Lock Joint conduits can be used for this application.

High-impact Areas – Bullet Resistant

For high-impact or Class I, Division 2 applications, XW conduit may be used.

- Many utility companies utilize XW conduit for the protection of their fiber-optic cables in above ground and under bridge applications.
- XW conduit has been shown to stop a .45 caliber bullet at 20 ft.

Note: Iron Pipe Size (IPS) type conduit can easily be used with standard pipe clamps as the conduit is the same OD (outside diameter) as PVC and GRC conduits. IPS conduit also has a larger inside diameter than ID tubular type conduit allowing for more cable fill area.

ID (inside diameter) tubular type conduit has a smaller OD and therefore standard pipe clamps may be used with this type of conduit, but the sizing and fit will not be as designed. Care should be taken to choose the right size pipe clamp inside diameter for the appropriate sized ID tubular type conduit outside diameter.