

## **Liquidtight Conduit Systems– Frequently Asked Questions**

### **What are the applications for Carflex?**

Indoor/outdoor wet, damp, or corrosive areas.

Where flexibility is required such as for A/C condensers or electrical motor hookups.

See section 351-23(a) and (b) of the 1996 or 1999 NEC.

Carflex is permitted to be used in lengths longer than 6 feet per Section 351-23(b) Exception No. 1.

1/2" through 1" Carflex is listed for direct burial (earth and concrete encased).

### **What UL standard covers Carflex?**

UL1660, Liquidtight Flexible Nonmetallic Conduit

### **What is the flame resistance of Carflex?**

UL1660 specifies the ignition resistance test for Carflex. A bunsen burner is applied to the center of an 18" long vertical specimen for three 60 second applications with a 30 second pause between applications. The specimen shall not ignite combustible materials in its vicinity or damage more than 25% of the indicator flags placed on the specimen. Also, the specimen can not ignite a cotton sample placed at the base of the Carflex.

### **Can Carflex conduit and fittings be direct buried?**

Yes. 1/2" through 1" are listed by UL for direct burial or concrete encasement applications. 1-1/4" through 2" do not meet the crush requirements for this installation and are not listed to be direct buried nor encased in concrete.

Carflex listed for direct burial is so marked. Electrical inspectors can look for the "DIR BUR" printed on the product for verification.

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### What temperature limitations apply to Carflex?

The heat from ambient temperature (surrounding air) plus that from the ampacity (current) from the conductors may not exceed 80°C (176°F) dry or 60°C (140°F) wet. This same restriction applies to metal Liquidtight Conduit.

Carflex does not have a lower temperature limitation since it may not be used in areas where subject to physical damage. PVC material does not breakdown due to lower temperatures, but will become more brittle and therefore more susceptible to damage due to physical contact.

### Why is the temperature restriction on Carflex different from that on Rigid Nonmetallic Conduit (RNMC) and Electrical Nonmetallic Tubing (ENT)?

Because Carflex is mostly a flexible PVC. If UL applied the same criteria for the rigid products to the Carflex, there would be no practical use for the Carflex.

### In Article 351-22 of the 1999 NEC, which item identifies Carflex?

Carflex is identified by item (2) a smooth inner surface with integral reinforcement within the conduit wall.

### Can I use metal Liquidtight fittings with Carflex?

Liquidtight fittings will be marked with the style of LFNC for which they are listed. Fittings are not interchangeable between LFNC styles unless they are so marked." The other types will be types "A" and "C".

I also need drawings and dimensions on the various fittings used with the CarFlex, especially to interface with PVC and FRC conduits. The primary size I use is 2" (50mm).



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The Carflex catalog will include dimensional drawings of the Carflex Fittings. 90% of the time when Carflex (LFNC) switches over from a LFNC to a PVC or Fiberglass conduit it will terminate into a junction box. LFNC Fittings has to be used with LFNC per the NEC. It is allowed to use a LFNC Fitting with a PVC Female Fitting. The PVC fitting would solvent cement to the PVC conduit and the LFNC fitting would screw into it.

[Do you have a liquid tight to rigid steel adapter for your Carflex product?](#)

A liquidtight fitting should be able to screw right into a female metal coupling used on rigid steel conduit. Liquidtight conduit is required to use liquidtight fittings. Also, you can terminate into a junction box.

[How does 2" Carflex liquidtight conduit fit to part no. # E986J?](#)

2" Carflex needs to be used with liquidtight fittings. The fittings need to be threaded into the connection. Since the 2" LB is utilizes with hub connections for schedule 40 conduit. With a small piece of 2" schedule 40 and a 2" female adapter a connection can be made. It may be best to use a junction box to make the transition.

[We have an immediate application for 2000 feet of 1/2" Carflex liquidtight conduit, but need verification of the PVC coating before the order can be placed. The exterior service is not compatible with some formulations of PVC, we need the MSDS sheet of the PVC used in the manufacturing in order to assess the suitability.](#)

Our Carflex is made of PVC and we do not have an MSDS available for it. Furthermore, our formulation is proprietary. The chemical resistance can be looked up at the following web site.

25701 Science Park Drive  
Cleveland, Ohio 44122  
216-464-3400  
1-800-3CARLON (322-7566)  
[www.carlon.com](http://www.carlon.com)



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<http://www.coleparmer.com/techinfo/chemcomp.asp>

If you still have uncertainties, contact your local Carlton Sales Representative for a sample. If there are any further questions for specific suitability in a given environment, prototype samples should be tested under actual conditions.

I have to connect 1/2in Carlton flex to 1in pvc conduit some 300 times. What do you recommend to make this connection? The connections will be in tree planters so waterproofing is necessary. Help! I don't want to buy a lot of diff fittings. Thanks

You introduce two challenges, 1) you are reducing from 1" Rigid Nonmetallic Conduit (RNC) to 1/2" Liquidtight Flexible Nonmetallic Conduct (LFNC) and 2) you need to make a connection from RNC to LFNC.

The cleanest way to do this is to have your 1" RNC terminate into a Junction Box by using a terminal adapter. The 1/2" LFNC than could connect to the junction box and continue. Of course this would either require you to modify the junction box or if you like we could do the modification for you. You would need a 1" nominal hole on one side and a 1/2" on the other.

Can you glue Carflex directly into Carlton PVC fittings?

Sorry, but fittings are not allowed to be glued or solvent-cemented to Carflex directly. Only a mechanical connection is allowed and you can only use Liquidtight Flexible Nonmetallic Type B fittings with our Carflex.

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Is it acceptable for Carflex to be solvent glued to fittings originally designed for rigid nonmetallic (PVC) pipe?

Technically, you're not supposed to solvent cement fittings to Carflex. Liquidtight Flexible Nonmetallic Conduit requires fittings to be attached mechanically rather than solvent cemented. In addition, since our Carflex is a type B liquidtight flexible nonmetallic conduit, you must use type B liquidtight fittings with it.

I need to know the smoke and flame rating of your conduit (liquid tight Carflex). I need this so I can get approval to use your product on our air conditioners for the locomotive-railroad industry.

Liquidtight Conduit is tested in accordance to Underwriters Laboratories Standard UL1660. A part of this testing is its flammability. Liquidtight Conduit does not get a "flame rating" but if it did it would be 94VO. You will notice that the product cannot have any dropping particles and must be self extinguishing.

I have a question on the 1/2" black. Is that the part # 15005BK-100 or what does the BK stand for?

"BK" stands for black.

Our Carflex is rated for direct bury, are the fittings rated also?

All of Carlon's fittings are listed for a "Wet Location" which includes direct Burial applications. See article 100 of the NEC under "Locations".

Does liquidtight have any sort of voltage rating?

The 2002 National Electrical Code says:

356.12 Uses Not Permitted.

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LFNC shall not be used as follows:

(4) Where voltage of the contained conductors is in excess of 600 volts, nominal That is true with the exception of Signs. See section 600.32 (Chapter 6 is allowed to amend Chapter 3) Neon secondary conductors over 1000 volts are permitted to wired in LFNC.

We have gone back and forth through the Carflex brochure and cannot see where it tells us what colors these part numbers are.

One picture shows material in gray, another in orange. There is also a notation that material can come in other colors, but we could not find where the colors were listed, and what differentiates the one color from another. Would you please educate us on this?

Carflex liquidtight flexible nonmetallic conduit is gray unless there is a "BK" number in the part number, which would indicate black. We used to offer colors a long time ago, and then discontinued offering all the different colors like blue, orange, white and so on.

**Is Carflex ozone resistant?**

Carflex is manufactured from PVC. PVC is an acceptable material to be used when exposed to Ozone. Attached is a link to Cole Parmer that shows how different materials behave when exposed to different chemicals.

<http://www.coleparmer.com/techinfo/ChemCompResults.asp>