Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat, SectionFormat,* and *PageFormat,* as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition.*

This section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" after editing this section.

Section numbers are from *MasterFormat 2010 Update.*

SECTION 26 05 33.03
ELECTRICAL NONMETALLIC TUBING (ENT)

Specifier Notes: Delete any information below in Parts 1, 2 or 3 which is not required or relevant for the project.

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes Electrical Non-metallic Tubing (ENT), fittings, boxes and support hardware. Fitting types for both snap and solvent cement connections with ENT. ENT is a non-metallic, non-conductive, non-corrosive pliable raceway system.

1.02 REFERENCES

A. Underwriters Laboratories, Inc. (UL):
1. UL 514C Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
2. UL1479 Fire Tests of Through-Penetration Firestops
3. UL1653 Electrical Nonmetallic Tubing

B. National Fire Protection Association (NFPA):
1. NFPA 70 National Electrical Code (NEC)

C. National Electrical Manufacturers Association (NEMA)
1. NEMA OS-2 Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports
2. NEMA TC-13 Electrical Nonmetallic Tubing

D. Canadian Standards Association (CSA):
1. CSA C22.1 Canadian Electrical Code Part I (CEC)
2. CSA C22.2 No. 227.1 Electrical Nonmetallic Tubing

1.03 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Product Data:
1. Submit manufacturer's descriptive literature and product specifications for each product.
2. Manufacturer's product drawings.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Products shall be free of defects in material and workmanship.

B. Furnished ENT, fittings and boxes are listed and/or certified by third party agencies as suitable for the intended purpose.

1.05 WARRANTY

A. Product is warranted free of defects in material and workmanship.

B. Product is warranted to perform the intended function within design limits.

PART 2 – PRODUCTS

2.01 GENERAL

A. ENT shall be UL Listed and CSA Certified.

B. Fitting and boxes shall be UL, cULus Listed and/or CSA Certified.

2.02 MANUFACTURERS

A. Acceptable Manufacturers:
Thomas & Betts Corporation
8155 T&B Blvd
Memphis, TN 38125
800-816-7809, 901-252-5000
www.tnb.com

Product: Carlon® ENT

2.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. ENT Raceway

1. ENT Raceway shall be available blue, red, or yellow polyvinyl chloride (PVC) BLUE for branch wiring, YELLOW for communications, and RED for fire or emergency systems.
2. ENT Raceway shall be available in trade sizes 1/2” through 2”.
3. ENT Raceway shall be easily cut to length using shear type cutters.
4. ENT Raceway shall be hand bendable, corrugated of circular cross section. No special tools needed for bending.
5. ENT Raceway, Fittings, Boxes and Accessories shall not rust.
6. ENT shall provide protection for power wiring and communication conductors.
7. ENT shall have an ambient temperature range -4º F to 122º F.
8. ENT shall meet requirements of NEC for Electrical Nonmetallic Tubing.
9. Single manufacture shall provide ENT, Fittings, Boxes and Accessories to form a complete integrated raceway system.
10. ENT shall be listed to the requirements of UL Standard UL 1653 in accordance with Article 362 of the NEC and Section 12-1500 of the CEC.
11. ENT shall meet the requirements of BI National Standard CAN/CSA-C22.2 No. 227.1 - UL1653 and shall be Listed/Certified in accordance to the Electrical Codes.
12. ENT Raceway shall be recognized by CABO (The Council of American Building Officials) National Evaluation Report for use in 2-hour fire rated construction.
13. ENT Raceway shall be recognized for use in 2-hour fire resistive nonload bearing and load bearing wall assemblies.
14. ENT Raceway shall be recognized for use in 1-hour fire resistive nonload bearing wall assemblies.
15. ENT Raceway shall be recognized for use in a fire resistive ceiling assembly (up to 3 hours).

16. ENT Raceway shall be recognized for Through-Penetration Firestop systems as classified by UL to meet ICC building codes.
17. ENT Raceway shall meet BOCA, SBCCI, and ICBO codes for 3 hour Fire rated Floor/ceiling assembly.
18. ENT Raceway shall be recognized for use with PVC rigid nonmetallic conduit fittings.
19. ENT Raceway shall be rated for 90°C conductors US, and 75°C Canada.
20. Conductors shall easily push through the raceway (up to approximately 50 feet).
21. Outside Diameters of raceway shall meet IPS Dimensions
22. ENT Raceway shall be available in sticks, coils and reels.

B. Fittings
1. Fittings used withed ENT shall be listed and/or certified.
2. One piece ENT Coupling, Threaded Terminator and RNC Transition Fittings shall be rated concrete tight without tape.
3. Vertical and 45º Stub Downs shall be made available in 1/2" through 1" trade sizes. (Molded part to retain ENT for concrete pour and provides clearance for attaching fittings to ENT).
4. Vertical and 90º Stub Down Transition Adapter shall be made available in 1/2" through 1" trade sizes (Molded part to retain ENT for concrete pour and provides threaded port for transitioning to other conduit systems).
5. Quick Connect Couplings shall be available in 1/2"-1" trade sizes (Molded part which allows two pieces of ENT to be quickly coupled).
6. Quick Connect Male Threaded Adapter shall be available in 1/2"-1" trade sizes (Molded part which snaps onto a piece of ENT to allow it to have a male threaded end).
7. Quick Connect Male Snap-in Adapters shall be available in 1/2"-1" trade sizes (Molded part which snaps onto a piece of ENT to allow it to connect to an outlet or switch box).
8. Schedule 40 Male Terminal Adapter shall be available (Molded fitting which is solvent cemented to a piece of ENT to provide a male threaded end).
9. Schedule 40 Nonmetallic Couplings shall be available (Molded part which allows two pieces of ENT to be connected together with solvent cement).
10. Non-Metallic ENT Transition Adapters shall be available
    a. Male ENT to schedule 40 & 80 PVC Conduit
    b. ENT to EMT
    c. Reducers, ¾" to ½" ENT and 1" to ¾" ENT

C. Boxes
1. Boxes used withed ENT shall be listed and/or certified.
2. Non-metallic Mud Boxes shall be available.
    a. Mud Boxes with two 1", four ½" and six ¾" ports shall be available
    b. Mud Boxes with quick connect ports shall be molded out of Polycarbonate
    c. Mud Boxes with removable back shall be available
    d. Mud Box types shall include;
        1) Ceiling Box listed for fixture support up to 50 lbs. and ceiling fan support up to 35 lbs
        2) One Gang
        3) Two Gang
        4) 4 Square
3. Non-Metallic Outlet and Switch Box shall be available in Single and Two Gang
    a. Boxes shall have eccentric knockouts
    b. Two gang shall have dual voltage capability
    c. Optional dual voltage divider shall be available
4. Non-Metallic Box Extenders shall be available.
5. Non-Metallic Plaster Rings shall be available.
6. Non-Metallic Blank Covers shall be available.
7. Non-Metallic 4" Octagon Ceiling Boxes shall be available

PART 3 – EXECUTION

3.01 INSTALLATION

A. Store products in manufacturer's unopened package at -4°F to 158°F until installation.

B. Verify that dimensions are correct and site is in proper condition. Make sure that application of ENT is allowed by NEC.

C. Do not proceed with installation until all unsatisfactory conditions have been corrected.

D. Verify that product is listed and is properly marked.

E. ENT shall be installed per the technical assessment prepared by fire cause analysis for use in 1-hour and 2-hour rated construction.

F. ENT shall be installation in accordance with manufacturer's instruction, Article 362 of the National Electrical Code, Section 12-1500 of CEC, other applicable sections of the Code and local codes.

G. Only Carlon® ENT Blue cement recommended specifically for use with ENT and rigid nonmetallic fittings shall be used.

H. Handling temperature; -4°F to 104°F

I. Penetration of fire rated walls, floors or ceilings shall use Classified Through-Penetration Firestop Systems described in the current Underwriters Laboratories Fire Resistance Directory.

J. Install boxes, fittings, accessories, etc., as necessary for a complete system.

K. APPROVED USES:
   a. Concrete slab – NEC Article 362 / CEC Section 12-1500
   b. Walls - wood stud, masonry and metal stud – NEC Article 362 / CEC Section 12-1500
   c. Ceilings - permanent or dropped (free air only) – NEC Article 362 / CEC Section 12-1500
   d. Exposed – NEC Article 362 / CEC Section 12-1500
   e. Public Assembly – NEC Section 518.4, in nonfire rated and certain five rated structures
   f. Prewired – NEC Article 362 / CEC Section 12-1500
   g. Classified by UL 1479 for Through Penetration Firestop Systems in UL Guide Category XHEZ and current UL Fire Resistance Directory
   h. Three hour rated floor/ceiling assemble
   i. Raised Floors – NEC Section 645.5(D)(2)
   j. Exposed or concealed in building above three floors when a fire sprinkler system is installed in accordance with NFPA 13 – NEC Section 362.10(2)
   k. For use in residential attics up to 3 feet above the bottom of the ceiling joist.
   l. Maximum ambient temperature 140°F (60°C)

END OF SECTION