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Carlton
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25701 Science Park Drive
Cleveland, OH 44122

RESEARCH REPORT: RR 25234
(CSI # 16130)

Expires: December 1, 2004

Attn: David H. Kendall
(216) 766-6645

GENERAL APPROVAL - Renewal - Flex-Plus® Blue™ Electrical Nonmetallic Tubing (ENT) for use in concrete fire rated floor-ceiling assemblies, 3 hour maximum rating.

DETAILS

The Carlton Flex-Plus® Blue™ Electrical Nonmetallic Tubing is a polyvinyl chloride (pvc) tubing listed by Underwriters Laboratories, Inc.

Carlton Flex-Plus® Blue™ Electrical Nonmetallic Tubing (ENT) is approved for use in concrete slab or steel deck construction subject to the following conditions:

1. Concrete slabs shall be a minimum thickness of 6¼" when 1¼" ϕ or 1½" ϕ (ENT) is used.
2. Concrete slabs shall be a minimum thickness of 5" when ¾" ϕ or 1" ϕ ENT is used.
3. The ENT shall not be spaced less than 3 x conduit outside diameter on center and shall have a minimum 1½" cover.
4. The engineer of record shall provide details and calculations to the Structural Plan Check prior to obtaining a building permit. The calculations shall justify the use of ENT does not displace concrete in the compression zone. Details shall indicate the size and spacing of the ENT and minimum clearances from the reinforcing steel as per Section 91.1907 of the 1999 Los Angeles City Building Code where crossing runs occurs, additional slab thickness may be required.

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RE: Carlon Flex-Plus® Blue™ Electrical Non-Metallic Tubing (ENT)

5. In steel deck construction the ENT shall be limited to a maximum size of 1" ϕ with a minimum spacing of 18" o.c. The minimum lightweight concrete cover shall be no less than 1". The ENT may only be installed in steel deck construction where electrical raceways are permitted per the Research Report for the steel deck.
6. For Type I and Type II buildings, the tubing shall be terminated at a metallic fitting or fixture prior to emerging from the concrete slab or steel deck construction or shall be terminated at Carlon non-metallic electrical outlet box in a fire rated wall as permitted in Research Report No. 24426 and 24909.

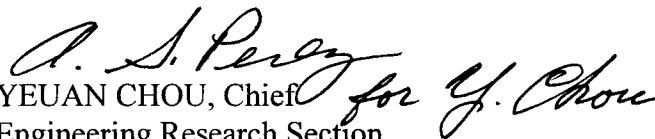
DISCUSSION

This approval is based on tests and engineering calculations. The slab successfully passed ASTM E119.

The tests were conducted with placement of conduits to the minimum extent allowed by the 1999 Los Angeles City Building Code per Section 91.1906.3.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.


YEUAN CHOU, Chief *for Y. Chou*
Engineering Research Section

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