Specification – Basorplast PVC Cable Trays – Three Part Specification

DIVISION 26

SECTION 260536 - CABLE TRAYS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

* 1. RELATED DOCUMENTS
		1. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
	2. SUMMARY
		1. Section Includes cable tray manufactured from rigid (non-plasticized) polyvinyl chloride (PVC).
	3. RELATED SECTIONS
		1. Section 27 05 36. - “Cable Trays for Communications Systems” for cable trays and accessories service communications systems.
		2. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
		3. Section 27 05 39 – Surface Raceways for Communications Systems
		4. Section 26 05 00 – Common Work Results for Electrical.
		5. Section 48 00 00 – Electrical Power Generation.
		6. Section 27 11 23 – Communications Cable Management and Ladder Rack.
	4. REFERENCES

A. American National Standards Institute (ANSI) / National Fire Protection Association (NFPA)

* + - 1. ANSI/NFPA70 – National Electrical Code (NEC).
		1. International Electrotechnical Contractors (IEC):
			1. IEC 61537 – Cable Tray Systems and Cable Ladder Systems for Cable Management.
		2. Telecommunications Industry Association (TIA):
			1. TIA 569-A (1998) – Commercial Building Standard for Telecommunications Pathways and Spaces.
		3. Underwriters Laboratories (UL):
			1. ANSI/UL568, Nonmetallic Cable Tray Systems
	1. ACTION SUBMITALS
		1. Product Data for Each type of product.
			1. Include data indicating dimensions for each type of cable tray indicated; a Manufacturer’s data sheet on each product to be used (including dimensions, material, UL Classification).
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Illustrative installation methods.
		2. Shop Drawings: For each type of cable tray indicated.
			1. Show fabrication and installation details of cable trays, including plans, elevations and sections of components and attachments to other construction elements. Designate components and accessories, including clamps, brackets, hanger rods, splice-plate connectors, expansion -joint assemblies, straight lengths and fittings.
			2. Verify loading capacities for supports.
	2. INFORMATIONAL SUBMITTALS
		1. Coordination Drawings: Floor plans and sections, draw to scale on which the following items are shown and coordinated with each other, using input from installers of the items involved.
			1. Include scaled cable tray layout and relationships between components and adjacent structural, electrical and mechanical elements.
			2. Vertical and horizontal offsets and transitions.
			3. Clearances for access above and to the side of cable trays.
			4. Vertical elevation of cable trays above the floor or below bottom of ceiling structure.
			5. Include scaled cable tray layout and relationships between components and adjacent structural and mechanical elements. Field verification of all dimensions, routing, elevation changes, etc. are required.
		2. Seismic Qualifications Certificates: For cable trays, accessories and components from the manufacturer.
			1. Basis for Certification: Indicated whether the product load carrying capabilities certification are based upon actual test of assembled components or on calculations.
			2. Dimensioned outline drawings of equipment unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
			3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
		3. Certification:
			1. Submit training procedure for certifying cable tray installers.
	3. QUALITY ASSURANCE
		1. Qualification of Installer: Certified by the manufacturer.
			1. Certified Installer: Cable tray installers shall have successfully completed manufacturers Certified Installer training program.
	4. DELIVERY, STORAGE and HANDLING
		1. Avoid breaking and scratching of finish. Damaged products shall not be installed. Store cable trays and accessories in original packaging in a location that is free from construction traffic and an environment that will damage the packaging materials.
		2. Store products in original unopened packaging until ready for installation.
1. - PRODUCTS
	1. MANUFACTURER
		1. Manufacturer shall be Basor Electric, which US office is located at 609 South Breese, Millstadt, Illinois 62260; Toll Free Telephone: 844-393-3985; Telephone: 618-476-6300; Fax:618-476-6301; E-Mail: customerservice@basor.com ; Web address: [www.basor.com](http://www.basor.com) or [www.basor.us](http://www.basor.us) .
		2. Substitutions
			1. Substitutions shall not be permitted.
	2. PVC CABLE TRAYS
		1. Cable Trays shall be a continuous, rigid extruded UV Resistant PVC (type BPE) member in a channel configuration designed expressly for cable management purposes.
			1. Cable tray system shall include, but will not be limited to, straight sections, elevation transitions, horizontal transitions, supports and accessories.
			2. Cable trays shall have a perforated bottom with an alternating slotted-hole patter. The minimum size of the slotted hole will be 22mmx 7.5mm and the maximum size of the slotted hole will be 35mmx9mm. (Where no tray ventilation or cable management fixing points are required then a solid bottom will be allowed.)
			3. Product: Basorfil Type BPE PVC cable trays by Basor Electric.
			4. Splices, nuts and bolts used to couple cable tray straight sections and manufactured fittings/transitions together shall be made of PVC.
			5. PVC Cable Tray Depth 2-inches (60mm)
				1. 4” (100mm) wide
				2. 6” (150mm) wide
				3. 8” (200mm) wide
				4. 12” (300mm) wide
			6. PVC Cable Tray Depth 4-inches (100mm)
				1. 8” (200mm) wide
				2. 12” (300mm) wide
				3. 16” (400mm) wide
				4. 24” (600mm) wide
			7. Length: The PVC Cable Tray straight section length shall be 118.1 inches (3,000mm) unless otherwise shown on drawings.
			8. Cable Tray covers to be solid PVC configuration and should be affixed to each tray without nuts or bolts or glue. They shall snap on each cable tray width. For outdoor applications or where access to the contents of the tray is to be limited to qualified individuals, install cover retention hardware that will result in the need for a tool to remove the cover.
	3. EXISTING PRODUCTS (general requirements for Cable tray)
	4. MATERIAL (performance requirements. PVC Cable Tray)
		1. Load Span Criteria
			1. Temperature Range for Safe Working Loads per manufacturer’s instructions.
			2. Splices located at the quarter support Span shall not diminish the rated load capacity of the cable tray.
			3. The PVC finish shall be type PVCM1 UV RAL 7035
			4. The PVC shall have an impact strength of 20J for tray sizes greater than 4” (100mm) wide. It shall have an impact strength of 10J for tray sizes 4” (100mm) wide or less. It shall meet the Mass Drop Impact requirements according to UNE EN 50085-1:2006/A1, paragraph 10.3 (Sept. 2003).
			5. The cable tray shall maintain it safe working load properties with out change in a temperature range of -4\*F minimum to a maximum of 140\*F
			6. The cable tray shall meet the M1 reaction to fire acc. to UNE 23727.
			7. The cable tray shall be certified to meet the Glow Wire test degree 1760\*F per EN60695-2-11.
			8. The cable tray shall be certified to meet the requirements of Flammability UL-94-VO, ANSI/UL94-1995.
			9. The PVC materials in the cable tray shall have a limiting oxygen index (LOI) of greater than 50% per EN ISO 4589.
			10. The cable tray PVC material shall comply with the RoHS directive, 2002/95/CE.
			11. The PVC materials in the cable tray shall not contain any Silicone.
	5. MANUFACTURED UNITS
		1. Units shall be in pieces.
	6. EQUIPMENT
		1. Proper Material handling equipment shall be used on site to prevent personal injury or damage to materials.
	7. COMPONENTS
	8. ACCESSORIES
		1. Fittings: PVC cable tray fittings may be factory made by Basor Electric. Risers, Drops, Elbows, Tee’s, Crosses and other fittings shall be made of PVC and will be a solid bottom configuration.
		2. Supports: PVC cable tray supports shall be manufactured from rigid (non-plasticized) PVC materials, or stainless-steel type 304 or 316L if applied outdoors or in corrosive environments.
	9. FABRICATION
		1. Field fabrication or alterations of PVC cable tray fittings shall be allowed.
		2. Field Fabrication or alterations of PVC cable tray fittings can be made with a circular saw or Dremel tool.
			1. Tee Fittings can be fabricated in the field with the use of a powder paint coated stainless steel (Type 304 or 316L) Tee connection plate part number PDBPE 60/100 2/10135. A Cross is simply made from two Tee’s and will utilize the same connection plate. Refer to the manufacturer’s instructions for proper field fabrication of a cross or Tee.
			2. Variable angle horizontal transitions can be made with a stainless-steel splice coupling plate(s) (part numbers JUBPE-A 60 for 2” deep or JUBPE-A 100 for 4” deep).
2. – EXECUTION
	1. INSTALLERS
		1. On installations of greater than 500 feet (approximately 152 meters) in total length, installers must be certified and trained by the manufacturer or manufacturer’s representative.
		2. Install as a complete system, including all necessary fasteners, splice plates, supports, divider strips, elbows, Tees, reducers, crosses vertical splice plates, variable angle splice plates hinged splice plates and covers.
	2. EXAMINATION
		1. Examine materials to be installed, comparing them to the manufacturer’s specifications and spec sheets (drawings). Do not proceed with installation until materials are confirmed to be within the prescribed condition.
		2. Examine materials to be installed for cleanliness and hidden damage resulting from poor material handling practice.
	3. CABLE TRAY INSTALLATION
		1. Install cable trays according to the manufacturer’s installation directions.
		2. Install cable trays as a complete system, including fasteners, hold-down clips, support systems, barrier strips, adjustable horizontal and vertical splice plates, elbows, reducers, tees, crosses, cable dropouts, adapters and covers.
		3. Install cable trays so that the tray is accessible for cable installation and all splices are accessible for inspection and adjustment.
		4. Remove any burrs or sharp edges from cable trays that result from field fabrication.
		5. Fasten cable tray supports to building structure and install seismic restraints as applicable.
		6. Design fasteners and supports to carry cable tray and the cables.
		7. Place supports so that spans do not exceed maximum spans on loading schedules and provide clearances shown on drawings.
		8. Construct supports from appurtenances furnished by the cable tray manufacturer. Arrange supports in trapeze, wall-bracket form or directly upon the floor or machinery as required by the application.
		9. Support Cable Tray assembly to prevent twisting from eccentric loading.
		10. Locate and install supports according to the installation directions provided by the manufacturer. Do not install more than one cable tray splice between supports.
		11. Make connections to equipment and flanged fittings fastened to cable trays to equipment. Support cable trays independently of fittings. Do not transfer the weight of the cable trays to equipment enclosures.
		12. Install expansion connectors where cable trays cross building expansion joints and in cable tray runs that exceed dimensions recommended in the installation instructions from the manufacturer. Space connectors and set gaps according to those instructions. To assure good performance under expansion, the increase in temperature must be noted, between the installation and the maximum temperature expected for the installation. Depending upon the expected increase in the temperature (deltaT) a gap (h) is to be left between the joining cable trays per the following table:



* + 1. Make changes in direction and elevation using the manufacturer’s recommended fittings or field fabrication instructions.
		2. Make cable tray connections using the manufacturer’s recommended slice fittings.
		3. Seal penetrations through fire and smoke barriers in accordance with requirements in NFPA 70, National Electrical Code, Section 300.21. If cable trays are sized for futures cables, specify provisions for penetrations with sleeves through fire-rated partitions or use “repairable” firestop sealing material.
		4. Install capped metals sleeves for future cables through firestop-sealed cable tray penetrations of fire and smoke barriers.
		5. Install cable trays with enough workspace to permit access for installing cables.
		6. Install barriers to separate cables of different systems, such as power, communications and data processing; or different insulation levels such as 600, 5,000 and 15,000 V.
		7. Install permanent covers, if used, after installing cable. For outdoor applications or for where access to the contents of the tray is to be limited to qualified individuals, install cover retention hardware that will result in the need for a tool to remove the cover.
		8. Install warning signs in visible locations on or near cable trays after cable installation. The signs shall use black lettering at least 1-1/2 (40mm) high on yellow background with the legend “Warning! Not to be used as a Walkway, Ladder or Support for Ladders or Personnel.”
	1. CABLE INSTALLATION
		1. Install cables only when each cable tray run has been completed and inspected.
		2. Fasten cables on horizontal runs with environment appropriate cable ties according to the methods demonstrated in NEMA VE2. Tighten cable ties only enough to secure the cable, without indenting the cable jacket. Install cable ties with a took that includes an automatic pressure-limiting device.
		3. Fasten cables on vertical runs to cable trays every 18 inches (450mm).
		4. Fasten and support cables that pass from one cable tray to another or drop from cable trays to equipment enclosures. Fasten cables to the cable tray at the point of exit and support cables independent of the enclosure. The cable length between cable trays or between cable tray and enclosure shall be no more than 72 inches (1,800mm).
		5. In existing construction, remove inactive or dead cables from the cable trays before active cables are installed.
	2. CONNECTIONS
		1. Connect raceways to cable trays according tro requirements in NFPA 70, National Electric Code.
	3. FIELD QUALITY CONTROL
		1. Perform the following tests and inspections [**with the assistance of factory-authorized service representatives]**:
			1. After installing cable trays and after the electrical circuitry has been energized, survey for compliance with requirements.
			2. Visually inspect cable insulations for damage. Correct any sharp corners, protuberances that appear in the cable tray, vibrations and thermal expansion and contraction conditions, which may cause or have caused damage.
			3. Verify that the number, size and voltage of cables in cable trays do not exceed that permitted by NFPA 70. Verify that communications or data-processing circuits are separated from power circuits by barriers or are installed in separate cable trays.
			4. Verify that there are no intruding items such as pipes, hangers or other equipment in the cable tray.
			5. Remove dust deposits, industrial process materials, trash or any description and any blockage of tray ventilation.
			6. Visually inspect each cable tray joint for mechanical continuity.
			7. Check for missing, incorrect or damaged bolts, bolt heads or nuts. When found, replace with specified hardware.
	4. PROTECTION
		1. Install temporary protection for cables in open trays to safeguard exposed cables against falling objects or debris during construction. Temporary protection for cables and cable tray can be constructed of wood or metal materials and shall remain in place until the risk of damage no longer exists.