



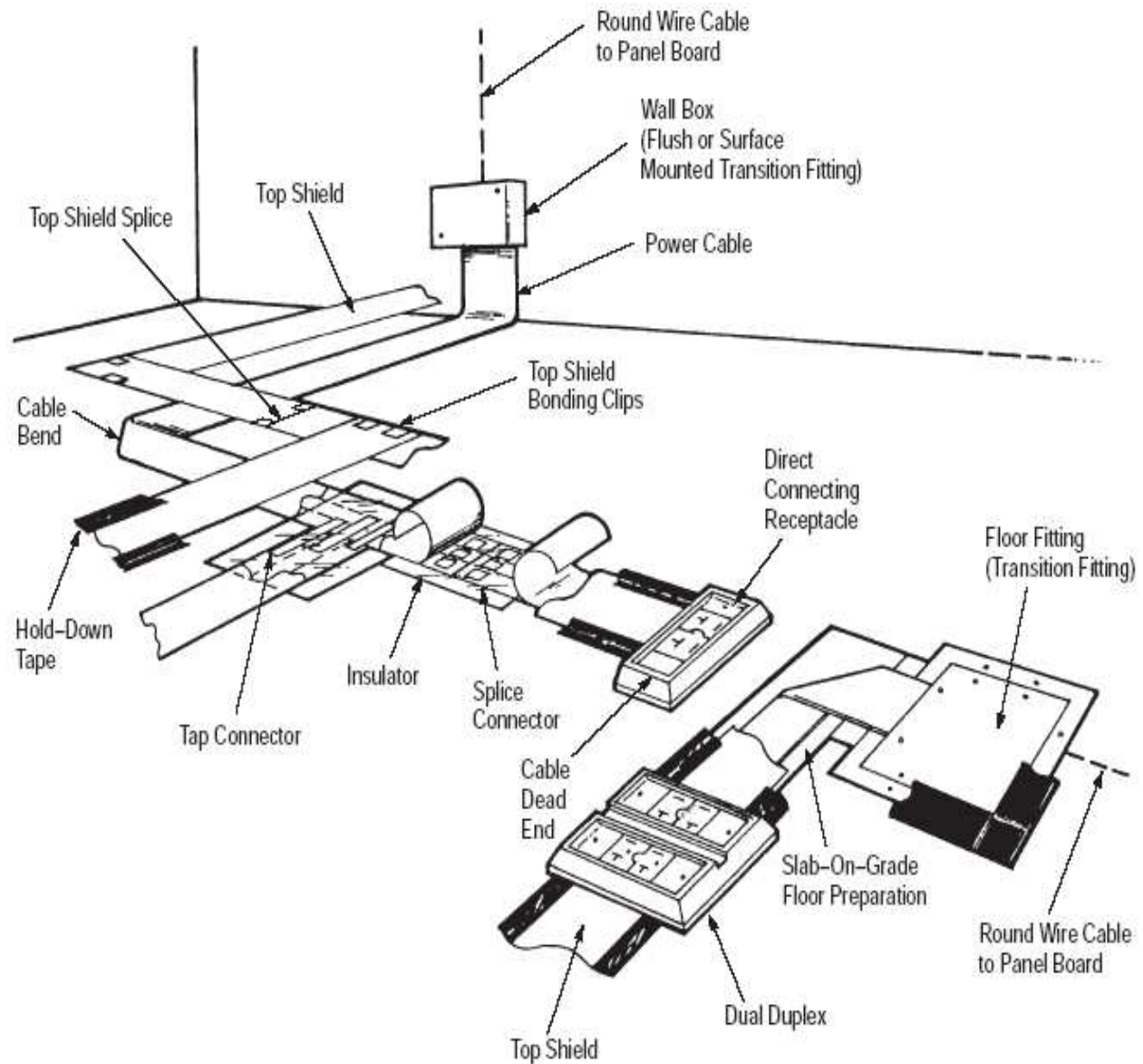
UNDERCARPET CABLING SYSTEM

Typical Q & A Regarding the Power & Communications Systems



Undercarpet Cabling System

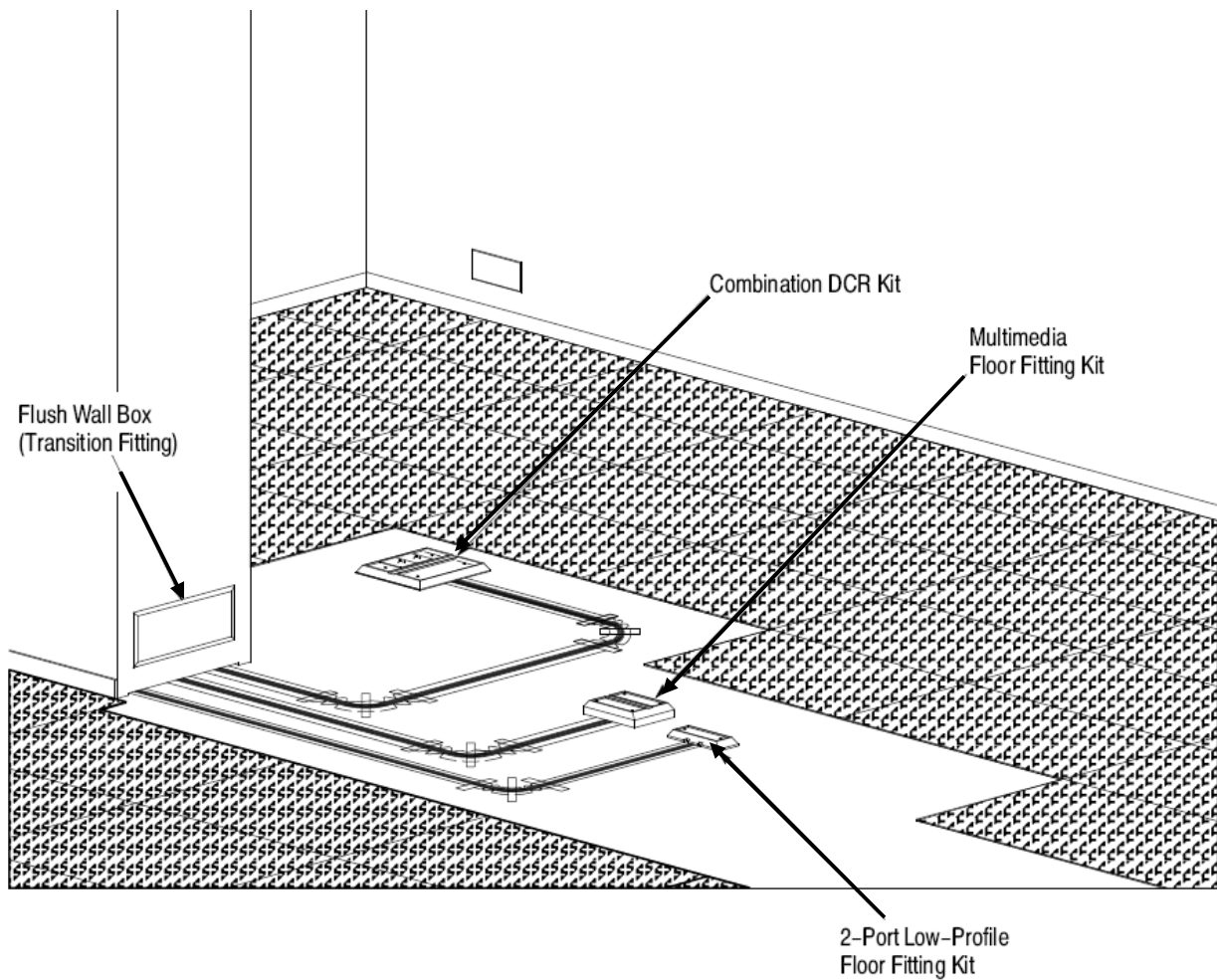
Typical Layout – Power



Undercarpet Power System
Typical Layout

Undercarpet Cabling System

Typical Layout – Communications



Undercarpet Communications System
Typical Layout

Undercarpet Cabling System

Common Questions with Answers

- Will the product meet typical building codes?
 - Yes. *The Undercarpet product is recognized under Article 324 of the National Electrical Code (NEC) and is UL Listed under File E73212 (cable) and File E73213 (fittings and assembly components). The product is also recognized under Section 12 and Section 60 of the Canadian Electrical Code (CEC) and is Certified by CSA International under File 7189 (cable, fittings and assembly components) and File 60814 (communications cable).*
- How much of a premium will I pay for your product compared to standard wire?
 - *We anticipate that the bottom-line cost to you will be significantly lower when compared to standard wiring. However, a full understanding of the project requirements and the Undercarpet system components by you and your team are required in order for you to develop an estimated bill of materials. Only then may an accurate and tangible cost for the Undercarpet project be generated for comparison with a hard-wired solution.*
- Will I need an electrician to install/splice or can one of my experienced technicians learn how to do it?
 - *As with all high voltage applications, it is up to the installer to determine the level of skill needed by their employees. Our engineering team has made every effort, with the installation in mind, to utilize smart designs based on best trade practice implemented in the field. If a portion of our system is not plug-and-play, then in most cases the product can be assembled with a screwdriver. Where taps and splices are used, a crimping tool (Part No. 91384-1) is available to help manage installation efficiency.*
- Will the Undercarpet cabling system support high volume traffic, and how much weight load will the cable endure?
 - *The Undercarpet Cable product has met stringent mechanical abuse testing which simulates high volume traffic environments such as condensed office areas and retail store environments. This testing includes a 300-pound load being applied to the product and cycled back-and-forth. During this test the cable is monitored for discontinuity, and after this load testing additional electrical evaluations (resistance and dielectric testing) are performed.*
 - *To date there has been no documentation or communication from any customers claiming to observe failure due to a high volume of rolling or foot traffic of the installed FCC product in the aforementioned areas.*

Undercarpet Cabling System

Common Questions with Answers

- Are CAD drawings available for Consultants?
 - Yes. The information can be found at the following web address:
http://www.ampnetconnect.com/support_center_literature_search.asp
- Why can't roll goods be used with the Undercarpet product?
 - The Undercarpet Flat Conductor Cable (FCC) is designed to provide an easy method for making required changes to the wiring system. Article 324.10(H) of the 2005 NEC states that FCC cables, cable connectors and insulating ends shall be covered with carpet squares. These carpet squares shall be attached with release-type adhesives. There is a limitation that is put on the overall size of the carpet squares (36" x 36") to comply with 324.10(H). Similar language is found within the 2006 CEC, Section 12 and Section 60.
 - The emphasis on carpet squares for applications using FCC is designed to reduce the likelihood of damage to the cable. For example, if roll goods are used with this application, there is a process by which the installer may/will need to cut the carpet. For this type of application there is risk of cutting into the cable, exposing the conductors, and destroying the sealed insulation system. For this case, the installer has created an increased risk for the end customer because an electrical short could result from a seemingly unrelated mishap, such as a leaky roof in an office area, or even a small spill of coffee, water, or other liquid which acts to saturate the carpet.
- What is the shelf life of the spray adhesive?
 - The shelf life for the spray adhesive is 15 months from the date of manufacture. The manufacturing date should be located on the bottom of the canister or on the packaging slip.
 - The spray adhesive offered is 3M™ Hi-Strength Spray Adhesive 90. Additional information, including Material Safety Data Sheets can be obtained directly from 3M Company, 3M Center, St. Paul, MN, 55144-1000 (1-888-364-3577).
- How much spray adhesive will be needed?
 - One can for every 100-ft of cabling is recommended, but actual usage of any sprayed material will depend on the user.
- How much tape will be needed for power installations?
 - It is recommended that the total length of cable required for the layout by multiplied by two, then divided by 180 (tape length per roll is 180-ft).

$\text{Number of Tape Rolls} = \frac{\text{Cable Length} \times 2}{180}$ <p>(for Power Cable)</p>

Undercarpet Cabling System

Common Questions with Answers

- How much tape will be needed for data/communications?
 - The amount of tape needed for data/communications will depend on the number of bends, but typically 6-inches of cross tape for every 5-ft of cable is recommended.

$\text{Number of Tape Rolls} = \frac{(\text{Cable Length} / 5\text{-ft}) \times 0.5\text{-ft}}{180} = \frac{\text{Cable Length}}{1800}$
<i>(for Data Cable)</i>

- Does Flat Conductor Cable (FCC) meet NEC Class I for commercial building applications?
 - The Flat Conductor Cable (FCC) is covered under Article 324 of the 2005 NEC and is UL Listed. Article 324.12 clearly states where FCC is and is not permitted for use. Per Article 324.12(3), the FCC product is not permitted for use in Hazardous locations. It is important that the application be reviewed for Classification, per Chapter 5 of the 2005 NEC, prior to installation of the FCC product.
 - We do not normally hear of any issues with the product being installed for commercial building applications; however please contact your local inspector to identify if there are any restrictions in the local code that would constitute not permitting the FCC product in your project.
- Is there a minimum distance between splices on a power cable?
 - There is a recommended 0.125-inch gap between the aligned cable conductors per the Instruction Sheet, #408-3128. A 1-ft square insulator patch (Part No. 556411-1) should be used to seal the system. One should avoid stacking up the insulators, so a distance greater than one foot is acceptable, however the product application specification along with the local code should be followed.
- Once the floor preparation, cable, top shield, and hold-down tape are in place, how thick is it?
 - Total thickness of the undercarpet power cabling stack-up (including floor preparation, power cable, top shield, and hold down tape) is 0.084-inches for 12 AWG cable, and 0.089-inches for 10 AWG cable. The actual dimension will depend on where you are measuring from.
 - Total thickness of the undercarpet communications cabling stack-up (including communications cable and hold down tape) is 0.113-inches for Category 5E cable, and 0.113-inches for Category 6 cable.

Undercarpet Cabling System

Common Questions with Answers

- What is the voltage rating of the power cable?
 - Maximum voltage between ungrounded conductors is 300 volts.
 - Maximum voltage between grounded and ungrounded conductors is 150 volts.
- If the customer puts in a 20-amp breaker, can the 3-conductor 12AWG cable be used?
 - Yes. The 12 AWG cable is rated for 20-amperes and the 10 AWG cable is rated for 30-amperes.
- What is the top shield made of?
 - The top shield is made from a corrosion-resistant steel material.
- How are turns made with the cable?
 - For the power cabling, taps or splices can be used to make turns. The cable can also be folded to create 90-degree turn.
 - For the communications cabling, the notching tool (Part No. 1725698-1) can be used to notch the cable's wings, and then the cable can be easily bent to form a gradual turn. Folding the communications cable is not recommended since this may degrade the Category performance of the cable.
- Can the Undercarpet System be installed in schools?
 - Per Article 324.12(4) of the NEC, the Undercarpet System is prohibited in schools. In North America, the term 'school' may refer to any institute of education, at any level and covers all of the following: preschool (for toddlers), kindergarten, elementary school, middle school (also called intermediate school or junior high school, depending on specific age groups and geographic region), high school, college, university, and graduate school. However, some customers have used this product in areas of schools such as a computer labs, libraries, and administration buildings on college campus. Efforts shall be made to work with the local inspector to review local interpretation and allowances for the project.
 - For installations within Canada, the 2006 CEC prohibits installation in schools EXCEPT in office areas. See Rule 12-806 of the 2006 Canadian Electrical Code for more information.
- Is there a suggested CSI spec?
 - Yes, one is available upon request: Section 16120 – Undercarpet Cables.

Undercarpet Cabling System

Codes & Agency Specifications

- Undercarpet Power Cabling meets the following:
 - *Power Cabling Voltage Rating:*
 - 300 volts AC
 - *Power Cabling Current Rating:*
 - 20 amps (12 AWG)
 - 30 amps (10 AWG)
 - *Communications Cabling Voltage Rating:*
 - 300 volts AC or DC
 - *Communications Cabling Category Performance:*
 - Enhanced Category 5E
 - Category 6
 - *Power and Communications Cabling Systems Comply with 2005 and 2008 National Electrical Code:*
 - Article 324
 - Article 800.179(F) [NEC 2005] and
 - Article 800.154(C)(6) [NEC 2008]
 - *UL Listed:*
 - Flat Conductor Cable, Type FCC (UL File E73212)
 - FCC Fittings (UL File E73213)
 - Communications Cable, Type CMUC (UL File E138034)
 - UL 444 – Communications Cables
 - *Complies with CSA C22.1-06, “Canadian Electrical Code, Part I”:*
 - Section 12, Rule 12-800
 - Section 60, Rule 60-320
 - *Certified by Canadian Standards Association:*
 - Flat Conductor Cable, Type FCC, and FCC Fittings (File 7189)
 - 15 amp receptacles are standard for Canada installations
 - Communications Cable, Type CMH (File 60814)
 - FCC Fittings and Modular Jacks (File 7189)
 - CSA C22.2 No. 214-02 – Communications Cables
 - *Communications Cabling Meets and exceeds TIA/EIA-568-B.2 (Category 5e Component) and TIA/EIA-568-B.2-1 (Category 6 System) performance requirements*

Undercarpet Cabling System

Warranty Information

- **Condition 1:**
 - ***If you are a ND&I and have completed all of the necessary training required by AMP NETCONNECT, then our warranty conditions are:***
 - 90-day for the Undercarpet Power Products **components**, providing they are installed per the applicable instruction sheet and the overall system is installed in accordance with the AMP NETCONNECT Undercarpet Cabling Planning and Installation Manual.
 - 25-years on **components or performance warranty** for the **Data/Communications Applications**.

- **Condition 2:**
 - ***If you are a registered contractor (requires entry level training), then AMP NETCONNECT warranty conditions are:***
 - 90-day for the Undercarpet Power **components**, providing they are installed per the applicable instruction sheet and the overall system is installed in accordance with the AMP NETCONNECT Undercarpet Cabling Planning and Installation Manual.
 - 25-year warranty for the voice, data, and video **components**.
 - ***This installation does not qualify for the 25-year System Performance warranty.***

- **Condition 3:**
 - ***If you are NOT a registered contractor with AMP NETCONNECT, then our warranty conditions are:***
 - 90-days for the Undercarpet Power **components**, providing they are installed per the applicable instruction sheet and the overall system is installed in accordance with the AMP NETCONNECT Undercarpet Cabling Planning and Installation Manual.
 - 90-days for the voice, data, and video **components**, providing they are installed per the applicable instruction sheet and the overall system is installed in accordance with the AMP NETCONNECT Undercarpet Cabling Planning and Installation Manual.

Undercarpet Cabling System

Additional Information

- **Product Information Center: (800) 522-6752.**
- Customer Service (Pricing Inquiries): (800) 553-0938.
- Undercarpet Cabling Planning and Installation Manual, #409-5566.
- Application Specification for Undercarpet, #114-6008.
- Instruction Sheets available on request, or from the website:
<http://www.ampnetconnect.com/default.asp>