PICKING ON ICKY PICK

By Carol Everett Oliver, RCDD

QUESTION: I DREAD INSTALLING LOOSE TUBE FIBER OPTIC CABLES BECAUSE OF THAT MESSY GEL. NEVER MIND CLEANING THE GOOP OFF THE FRAGILE FIBERS AND MY FINGERS, TRY REMOVING IT OFF OF CLOTHING. NO WONDER IT'S REFERRED TO AS "ICKY PICK." IS THERE A BETTER WAY?

ANSWER:

The answer is an emphatic, "yes!" Working with a gel-filled cable has been a concern of installers for some time. That gel, also called "icky pick," actually has a purpose: to prevent water penetration. This added protection is needed mainly for outdoor installations, where water ingress is an issue, not only because of rain or melting snow, but also in locations where humidity can create condensation within the jacket. To better understand the whys and whatnots of icky pick, let's look at the real issues and the re-engineered alternatives and solutions.

IT'S ALL ABOUT PROTECTING THE FIBER

To understand the reasoning behind the development of icky pick, let's look at the various fiber optic cable components. Optical fiber cables are designed to protect the fiber strands inside them. Because of the protective layers around the fibers, optical cable isn't as fragile as you think. There are basically two ways of protecting the glass fibers. One is through a plastic coating that is applied directly to the glass optical fiber itself, known as a "tight buffer" construction. The other is to insert the glass fibers, either individually or in groups, into a hollow tube, for a "loose tube" construction. The environment and building codes establish the particular type of cable construction that is selected for each installation. Normally, tight buffer is specified for inside plant, such as riser and premise distribution and interconnect (patch cord) applications, while loose tube is mainly used between buildings and outside plant installations, such as underground, lashed or aerial.

Tight buffer cable utilizes a construction in which a thin layer of plastic (or buffer) is extruded directly onto the optical fiber. The buffer is typically 900 microns in diameter and the buffered fibers are then cabled together with aramid strength members and an overall jacket. Tight-buffered cable is usually installed where cable flexibility and ease of termination are important criteria. The tight-buffered fibers provide additional robustness for handling and make color-coding easier. While the absence of the messy gel, or icky pick, makes tight-buffered cables somewhat easier to install and terminate than loose tube cables, this construction does not provide the optical fibers the same level of physical protection against the harsher outdoor environmental conditions. The expan-

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Berk-Tek's Adventum indoor/outdoor cables are designed with the unique DryGel™ water blocking system, which utilizes super absorbent polymers to replace the messy gel filler, or "icky pick," inside the fiber tubes.

sion and contraction of tight-buffered materials in fluctuating temperatures can place a strain on the fiber, resulting in an increase in attenuation. Over time, constant exposure to wetness will be absorbed within the buffer, which will decrease fiber reliability.

Loose tube cables are mainly designed for outside plant installations. The loose-tube construction places a loose plastic tube around the fiber, much like a loose straw, resulting in a diameter several times larger than the fiber. Because the fibers are loose they can move freely and are protected from the effects of mechanical stresses. Originally, these tubes were filled with the gel substance aptly nicknamed "icky pick" which has a consistency like jelly. The gel protects the fibers from temperature fluctuations and water ingress. The stranded cores of the loose tube cables were further flooded with a different type of gel to prevent water ingress within the interstitial spaces between the stranded loose buffer tubes, the cable strength members, and the outer jacket (or sheath) of the fiber optic cables.

Most icky-pick gel compounds are highly flammable and therefore have difficulty meeting the stringent UL flame retardency certification burn tests needed for plenum and riser listings. Therefore, these cables must be transitioned to the appropriate flame-rated cable designs within 50 feet of the building's entrance.

Prior to termination, it is critical that loose tube cables be meticulously cleaned with a solvent to remove the gel-flooding material prior to termination and then dried with paper towels or clean cloths. A breakout kit is also needed if field installation with anaerobic or heat-cured connectors is required. The gels must be removed in order to smoothly insert the fibers into the furcation (or breakout) tubing.

The process to clean the gel is tedious and messy. The buffer tube needs to be removed and each fiber needs to be cleaned before termination. In addition, it is also advisable to seal the cable and to keep the gel from leaking out. More thorough cleaning of the fibers gives you a cleaner termination, resulting in a better performing cable. Disposal of these cleaning items is also a concern for installers since many of these solvents require specialized containers and disposal locations.

TODAY'S ALTERNATIVES

The good news is that gel-free loose tube cables have been engineered to eliminate time-consuming installation procedures, and save on cleaning bills. Gel-free or "all-dry" cables eliminate the labor to remove the gel, as well as the costs of consumables such as cleaning solvents, wipes and paper towels, and new clothes.

"For us it is a major cost savings because we don't have to go through the additional labor of cleaning each strand individually and as the fiber count increases, so do the cost savings," states Rich Imparato, president of Bullet Communications, a major installation firm in New Jersey. "Recently we installed 7,000 feet of Berk-Tek's indoor/outdoor Adventum cables with the DryGel and all we had to do is slip on the fan-out kits. Termination was clean, simple and quick," he adds.

The special powder used as a water-blocking agent in all-dry cables is based on super absorbent polymer (SAP) technology. The fibers are encased in gel-free buffer tubes and the SAP is applied in several different ways. Known as "dry blocking" this relatively new technology contains no gels or oils, which means faster and easier installation and termination procedures. The SAP material is also lighter in weight and allows for smaller tube and cable designs, which creates a more compact and flexible design, critical for high-density installations.

Different manufactures apply the SAP in different ways. Some for example, use a process whereby the SAP is applied using an electrostatic charge on the fibers which is opposite from the charge on the powder. This assures that only the right amount of SAP is pulled into the tube. Too much powder, and you could have an issue with microbend loss of optical power. Other manufacturers use yarns and tapes inside of the buffer tubes and in the cable core. When this method is used, the user must be very careful not to cut the fibers while removing the yarns and tapes. Furthermore, the yarns inside of the tubes may become tangled with the fibers, which could also cause attenuation and breakage during excessive handling.

It is also important to note that the SAP powder is of the same grade used in baby diapers, feminine hygiene products, and in the food packaging industry. This should alleviate any concerns about the "user friendliness" of the SAP material.

Referred to by many manufacturers as "indoor/outdoor" cable, these all-dry, flame-rated designs afford the installer the ability to place cable anywhere in a

network, bypassing the traditional transition points required in most installations.

However, cable constructions vary from manufacturer to manufacturer. When specifying an indoor/outdoor, gel-free, water blocked cable construction, make sure that they have been tested to meet (or exceed) key industry specifications, such as ICEA S-87-40, ICEA-696 and the Telcordia GR-20 to ensure the long-term reliability in both indoor and harsh outdoor environments.

While gel filled, outside plant, loose-tube optical fiber cables are still appropriate for specific types of installation environments, there is an alternative available today. All dry loose tube indoor/outdoor cables can reduce installation costs, provide a more compact design and provide protection from outdoor environments, all without having to deal with icky pick. ■

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