TECHNICALLY SPEAKING

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Why the QbE Cleaning System is the Best Choice for Fiber Optic Cleaning

The other day I received a good question from a Verizon fiber optic cable installer. "Why should I use your products rather than the Rainbow products I'm already using". The short answer is simply that while other companies off a collection of products for fiber end face cleaning, ITW Chemtronics offers an integrated system of products for this important job.

Telecom companies are investing heavily in Fiber-to-the-Premises or FTTP, to deliver bundled Broadband, DSL, Internet, movies-on-demand, TV, and telephone services direct to consumers' homes. This means that as many as eight million (8,000,000) fiber optic connections will be made within the next three years alone. Each of these fiber optic connections will have to be cleaned to insure reliability and long-term service. Installing and servicing so many fiber connections will mean a big investment in time and cost, so any cleaning method that can save time will also lower cost. The Combined Cleaning Procedure or CCP utilizes both **tools** and **chemicals** to quickly and reliably clean fiber end faces. It works so well that the installer can be confident that the terminals are clean, without the need for scope testing of the connections, which takes time and increases cost.

The CCP matches two proven cleaning solvents, Electro-Wash® PX Fiber Optic Cleaner (ES810) and Electro-Wash® MX Cleaner/Degreaser (ES1621), with a unique cleaning device, the QbE™ Cleaning System, to provide low-cost, reliable cleaning. The Electro-Wash® solvent products are designed to remove all the types of soils and contaminants normally found during fiber optic system installation and operation, while the QbE™ Cleaning System ensures complete, safe cleaning of the end face. The Chemtronics CCP is a cleaning method that has been field-tested Bell Labs, Verizon and AT &T and found to be fast and reliable.

Chemicals

Most installers use isopropyl alcohol (IPA) for cleaning fiber optic connections. IPA is a reasonably good, inexpensive cleaner, but IPA is also hydroscopic and rapidly absorbs moisture from the air. IPA is usually kept in a squeeze or trigger spray bottle. Each squeeze or pumping action draws moisture-laden air into the bottle, diluting the IPA with moisture and contaminating it with air-borne soils. IPA is a good solvent for polar soils like salt from human sweat, but not a good solvent for non-polar soils like oil and grease, that may be present from handling the connector. Since IPA alone does not handle all of these soil types it does not remove all contaminants from the end face.

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When a pre-saturated alcohol pad is used to clean the end face, the pad can "flood" the terminal with cleaner, which allows alcohol to become trapped in the fine space between the alignment sleeve and the cable. This traps moisture within the terminal, and this moisture can migrate throughout the terminal connection. Contaminant-laden moisture can end between mating end faces, causing signal distortion and contaminants within the moisture can be etched into the glass after prolonged exposure to the laser light signal.

Tools

The cleaning tool most widely used in cleaning fiber end faces today is the reel cleaner cassette (CleTop). Most reel cleaners have a spring-loaded mechanism which pulls back a sliding cover, exposing a small section of cleaning spool material. Each new action of this device draws a small section of cleaning material over an enclosed rubber platen and exposes this material for use. Most replacement cleaning spools are good for about 200 end face cleanings.

Since the window of the cassette exposes a very small cleaning surface craftspeople are prone to use a back and forth cleaning stroke, or twisting motion. Such motions can damage the end face or liberate lint from the surface of the spool material. Cassette cleaners are not designed to be used with cleaning solvents. Solvents can damage the spooling mechanism and also harden the rubber platen. The hardened platen surface can damage the end face as the end face is drawn over it. Reel cleaners also have a high initial investment of $70 to $120, for the reel cassette and $20 to $60 for each replacement cleaning spool.

The Combined Cleaning Procedure

The CCP is designed to overcome all the problems listed above, and provide safe, and inexpensive cleaning of fiber end faces. All CCP solvent cleaners are packaged in aerosol cans, so their exposure to the air and its contaminant load is minimized. Electro-Wash® PX Fiber Optic Cleaner and Electro-Wash® MX Cleaner Degreaser combine polar alcohols with non-polar hydrocarbons to dissolve both polar and non-polar soils.

The QbE™ Cleaning System employs a roll of 200 individual 3" x 3" non-woven, non-linting cleaning sheets, in a double walled, reinforced cardboard carton, with an attached rubber cleaning platen. The larger surface of each sheet allows the employment of a safer one-way cleaning stroke, with no need to go back and forth. Since the QbE™ Cleaning System was designed to allow a "wet" cleaning procedure, it can be used with solvents.

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Economy and Cost Analysis

The CCP method can be 4 to 5 times less expensive than the use of IPA and a reel cleaner cassette. For large hub installation, a QbE™ sheet can be folded in half or even in thirds, so you clean to two or three connections per sheet. Each can of ES810 contains enough cleaning product to clean at least 400 end faces. At an average cost of $95 for a cleaning cassette, and discounting the cost of a replacement reel, the cost for 200 end face cleanings is $0.475 per cleaning. With a new QbE™ Cleaning System at $36 and a can of ES810 at $8 , 200 end face cleanings can be performed for approximately $0.22 per cleaning. If you divide each 3" x 3" QbE™ in half you can perform 400 end face cleaning, at a cost of only $0.11 per cleaning.

Support

ITW Chemtronics supports the Combined Cleaning Procedure with detailed use instructions printed right on the QbE™ carton, so proper use instructions are always handy. The Chemtronics website contains many helpful application sheets on the topic of fiber optic cleaning and maintenance, while our technical support staff is ready to answer any questions our users may have, by telephone or e-mail.

My thanks to Ed Forrest for helping with this month's topic.