

New Breakthroughs Pave The Way For A Fusible Future

In the trenchless technology industry, the bar is constantly being raised by technological breakthroughs, many of them involving highly sophisticated technology. But sometimes, as in the case of a new product from NUCA-member Underground Solutions of Sarver, Pa., you can change the industry simply by teaching an old favorite some new tricks.

Underground Solutions is making waves in the industry with a new variety of fusible PVC. PVC has been an industry workhorse for decades, and fusion techniques are nothing new, either. But bringing the two of them together in a single application is causing many in the industry to take a second look at this innovative solution.

Why PVC?

The underground utility industry has been using butt-fused joints with HDPE pipe for more than 30 years now, according to Tom Marti, director of engineering for Underground Solutions. PVC, which enjoys 2.5 times the pressure capability of HDPE, has also seen extensive use, relying on a traditional bell-and-spigot joint up to this point. Despite the fact that bell-and-spigot joints allow some leakage that butt-fused joints prevent, PVC has been selected over HDPE in many applications because its increased

pressure capability allows for thinner pipe walls, which in turn means a larger flow area. PVC also has a higher tensile strength than HDPE, according to Marti, which allows contractors to work with longer lengths of pipe before becoming concerned with the material stretching.

“HDPE is limited in the length you can pull,” Marti said. “With PVC, you can theoretically pull up to 5,000 ft., and we’ve already sliplined a length of 3,000 ft.”

PVC and other plastic pipes are also favored over other materials because of their long in-ground life (100+ years), and the fact that plastic resists build-up of minerals and solids that cause tuberculation in many water and wastewater applications.

Clearly PVC has many advantages to bring to an application. But up until now, the necessity of using bell-and-spigot joints has limited the applications in which it can be used. Typically, such joints limit PVC to 20-ft. lengths, according to Marti, and prevent its use in many trenchless methods because the pipe can’t be pulled into place. Current standards for PVC also allow for a certain degree of leakage, and Underground Solutions CEO Mark Smith estimates that this leakage has risen to 20-25 percent in many older distribution systems.



Changing The Industry

That’s why many in the industry are excited about the new possibility to use fusion-butt joints with PVC. Since 1998, Underground Solutions has been developing a specially-formulated brand of PVC that can be fused together using existing fusion equipment. Their initial product was dubbed Duraliner, and focused on the pipeline rehabilitation market. The product worked by inserting fused PVC into existing pressure systems and using heat and pres-

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sure to expand the PVC once it was in place.

“Duraliner was the first fully structural rehab application available to the pressure market,” Marti said. “It’s the fully structural element of the application that truly makes Duraliner stand out.”

“These types of products have really changed the watermain rehab market,” said NUCA member Mark Harris, of American Water Services Underground Infrastructure, Inc. in Lake Mary, Fla. “For years, rehab applications have focused on treating water quality and flow. Now, we have products available that add structural rehab as well.”

“The entire existing pipe could decay, and the PVC insert would be 100 percent structurally sound, a completely stand-alone system,” Marti explained.

The system also benefits from the fusion-butt joint, which results in an entirely monolithic, gasket-free PVC conduit.

Underground Solutions is now expanding the product into all other trenchless methods as well. Their formula for PVC also meets all C900 industry specifications. The pipe can be fused with existing equipment designed for HDPE pipe, and the process is as quick or quicker than fusing HDPE, according to Marti. Smith sees numerous applications possible in sewers, gravity flows, and recycled water systems.

The Next Step

The company is currently talking with major pipe distributors in the United States, and Smith reported that the reception has been phenomenal, with 29 national distributors already lined up. The next step is to establish relationships with contractors and set up fusion service centers. The fusion process does require some additional training from HDPE installation, Marti said.

One NUCA member that is already lined up to use the product is Akkerman Equipment Inc. of Brownsdale, Minn. According to Terry Fisher, Akkerman learned of the product through the trade show circuit and from customers.

“Ray Tarker, a utility manager in Greenville, S.C., was looking for a method of trenchless installation of PVC on precise line and grade for

gravity sewer,” Fisher said. “A demo is being planned on site by Mr. Tarker and Akkerman using the Akkerman Guided Boring Machine (GBM) to install fusible PVC. The demo is tentatively scheduled for the first week in March.”

Underground Solutions’ product was ideal for the job.

“The Utility Commission of Greenville, S.C. had specified PVC for the new gravity sewer construction,” Fisher explained. “The installation is in the middle of existing roads, and with open cut, the road rebuilding costs are unacceptable. The fusible PVC provides a means of trenchless installation and stays with the pipe specified by the owners. The Akkerman GBM provides the means for straight line and grade accuracy.”

Fusible PVC also fit the bill for a separate job in Center Hill, Fla. The contract called for an HDD installation of 1,400 ft. of 8-in. water main. Underground Solutions Services Group was contracted by NUCA-member Wiring Technologies of Altamonte Springs, Fla. to supply and fuse C900 pipe. Underground Solutions supplied a fusion superintendent to perform the procedure using a standard McElroy TracStar #28 fusion machine. Thirty-foot sticks of Fusible C900 were fused together to build continuous runs of pipe. Lengths of 860 and 560 ft. were pulled in behind a Vermeer 33,000-lb. drilling machine. Wireless Technologies reamed an 11-in. hole in which to pull the water line. Pulling was completed with pressures between 2,000 and 2,500 psi. Connections were made using standard mechanical AWWA fittings. Work lasted approximately four days.

Terry Highnote, site superintendent for the project, reported that the PVC “worked like a charm. We found it much easier to deploy, since we could use a smaller reamer to pull it back, as it had no collar. There was some additional training involved, but only a couple of hours max, and it was our first time using the product. We completed the project right on schedule, and had a very positive experience.”

For the future, Smith sees his company developing fusible fittings, ranging up to 48 in. in size. But in the meantime, the future of fusible PVC looks bright as the company continues to develop and expand the product into other trenchless applications. ■



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