Ductile Iron/Why A New Standard?

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A s I travel the United States, many of you have two questions about iron pipe: (1) What does the revised AWWA standard really say? and (2) What are people saying about pressure class duc-
tile iron?

Canadian water suppliers have almost unanimously said "No" to ductile iron and "Yes" to PVC. (Yankton, SD, is an exception.) Our Canadian constituent, therefore, may choose to skip to another article but are welcome to continue reading for sheer curiosity's sake if they wish.

What does the standard really say? We just look at the standard itself. ANSI/AWWA C151/A21.51-91, "American National Standard for Ductile-Iron Pipe, Centrifugally Cast for Water or Other Liquids", is the standard in question. This fact then jump out to most is that this is not really a "new" standard. It carries a 1961 designation. The iron industry has curiously shied away from the fanfare typically accompanying a new or updated AWWA standard. The attitude appears to be much more a "wait and see" or perhaps "use only as required."

From C151, "Major Revisions. Major revisions made in this edition of ANSI/AWWA C151/A21.51 include incorporating a pressure class designation for ductile-iron pipe and adding 60" and 64" (1500 mm and 1600 mm) sizes..."standard thickness classes of ductile-iron pipe have been designated as special classes...

The old thickness classes (50, 51, 52, 53, 54, etc.) are now "special classes" and the norm is now "pressure class" designation.

The huge success of AWWA C605, "Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 inches through 36 inches," would certainly promote a reaction from iron. In essence, the thinking was that the iron industry would introduce Class 48, 48, etc. in larger diameters.

Understandably, the marketing folks don't think much of introducing a new "lower" classification to replace Class 40. A good deal of current iron users don't think much of Class 50 and 51 due to tapping problems and, of course, corrosion in general. It was predictable to see a "new" classification system. What was completely unpredictable was which products were included in the pressure class designation and which were deleted.

Table 1 (see page 5) compares 8", 12", and 24" diameter pipes.

Basically, the larger diameter scenario was accurate. In 4" pressure classes 300, 300, and 200 are marginally getting a Class 52, 51, and 50, respectively. 8" had larger, however, have been deleted. At 30" a pressure Class 150 or
problem is rarely difficult to find. The report states that the most common cause of tapping problems is just plain tapping too fast. Other culprits cited were dull cutters (or the wrong cutter) and improper techniques. One other interesting statistic is that 4 percent of the utilities reported 71 percent of the major tapping problems.

The report agrees with the Association's position. The key is education. Properly trained crews with the right tools do not have problems tapiing PVC pipe. We have two tools at your disposal for training your crew: Our Tapping Video and our Tapping Guide. (See pages 11 and 12 respectively.)

Longevity

The report should put rest once and for all any concerns users and specifiers may have about the pipe's longevity. To quote the report again: "Material-related long-term problems reported in PVC pipe are few and are decreasing with time. This is an indication that these problems are no result of aging." We would like to tell you that PVC water pipe is an absolutely fool-proof product that will never experience any problems. We can not make that claim, nor can any other piping product. We can say this, if you do have a problem, your system will most likely be under contractor warranty, because "Almost 50 percent of the problems reported in PVC pipe occur in the first year after installation."

Figure 2 shows the occurrence of problems as a function of time. As the graph shows and the report states: "It is evident that the problem rate is decreasing with time. If the pipe material were degrading as it aged, one would expect the opposite trend in the data (i.e., the problem rate would increase with time). This finding is consistent with previous studies on the aging of PVC."

Permeation

Another concern non-users have shared with AWWARF is that of permeation. This study put the issue into the proper perspective. "In regard to permeation, the utilities included in this study reported very little actual experience with this problem. It appears that the rubber gasket joints may be the weak spots as far as permeation is concerned. It is recommended that a study be undertaken that will obtain data on actual field experience combined with data from laboratory tests to better understand the importance of proper joint design to help minimize permeation."

The report goes on to say that "For future studies, it is recommended that utilities keep better records on problems they experience with any type of pipe. Accurate records will be particularly important for any future studies dealing with permeation."

We agree with the research team. The gasket is the weak spot. That is why AWWARF requires all gasketed piping standards to have a permeation warning statement. When using gasketed joints, with PVC or Ductile iron or Steel or what have you, the prudent engineer should consider permeation whenever he or she encounters a contaminated area.

On the brighter side, utilities infrequently encountered the problem. Only seven out of 162 (4%) utilities surveyed claimed to have any permeation problems whatsoever. The figure was originally 11 out of 162 (7%). But the subsequent follow-up found that one of the 11 had problems with polyethylene, not PVC; two had only heard of problems in other utilities; and one utility had problems with low-head irrigation pipe."

Testing

Research efforts were not limited to questionnaire alone. The team asked for pipe samples and go them. Sixteen utilities provided sixty samples. The samples were obtained from utilities across the United States and represented a variety of manufacturers. Samples received were manufactured by an different companies. The pipe samples were subjected to the following three tests to determine basic composition and extrusion quality: (1) Degree of Fusion Test, (2) Impact Test, and (3) Filter Content Test. As a result of the testing, the report finds that PVC pipe being installed in 1992 appeared to be of high quality."

Fisher Joins Uni-Bell

The Uni-Bell PVC Pipe Association has named Craig A. Fisher to the position of Association Engineer. "Craig's primary responsibility is to strengthen Uni-Bell's position as the source of technical information to the PVC pipe industry," said Deputy Executive Director Dave Eckstein.

Craig graduated from the University of Texas with a Bachelor of Civil Engineering and a Master of Business Administration. He is member of the American Water Works Association and the American Society for Testing and Materials. As Association Engineer, Craig is responsible for writing technical articles, responding to inquiries, conducting seminars, and representing Uni-Bell at professional meetings."

Locating

We feel we would be negligent if we did not tell you both the good news and the bad news. Your major concern with PVC pipe, if you had one, was locating. The feedback is important and we are listening. Work on locating non-metallic pipe is underway.