

On the Waterfront

by Jim Reed

Well, I'm already hearing superintendents wondering when the first snow is coming. It's been a long season and we're only thru May. April was wet and cool, May was dry and cool, and golfers wonder why their course isn't in U.S. Open condition. As of June 4th, Cog Hill reported .1" of rain since April 26, Exmoor had .4" for May and Glen View Club had .6". Irrigation systems are being put to the test and the roughmowers are being put to bed. Are we having fun yet?

With thanks to Frank Peterson of Dura Plastics, Chairman of the Fittings Group of the Irrigation Association, I have received permission to reprint excerpts of a handbook of irrigation design guidelines and precautions titled "Designing, Operating and Maintaining Piping Systems Using PVC Fittings", written and prepared by Ron D. Bliesner, Vice President of Keller-Bliesner Engineering of Logan, Utah on February 3, 1987. Mr. Bliesner's report begins with the following introduction:

"The piping industry was revolutionized by the introduction ... of PVC pipe and fittings. Piping system components manufactured from PVC exhibit excellent corrosion and resistance, are lightweight, have a high strength-to-weight ratio, are exceptionally durable, and have great resiliency ... The growth of the industry has been due to the availability of a wide range of PVC pipe sizes and compatible fittings that are inexpensive and easy to install.

The revolution in piping materials has been followed closely in irrigation systems ... by a revolution in sprinklers and control equipment. The advent of the valve-in-head sprinkler and computerized control systems ... has provided nearly unlimited flexibility in system operation. In earlier systems, the design consisted of the mainline system and lateral system, with a control valve separating the two. The pipe and fittings downstream of the control valve were pressurized only when that block was operating; they were vented to atmosphere through the sprinklers, so high surge pressures were unlikely. Also, the control systems were less sophisticated, with less flexibility, which meant that flow-rates in the system could be more easily balanced at design time, reducing the potential for high surges.

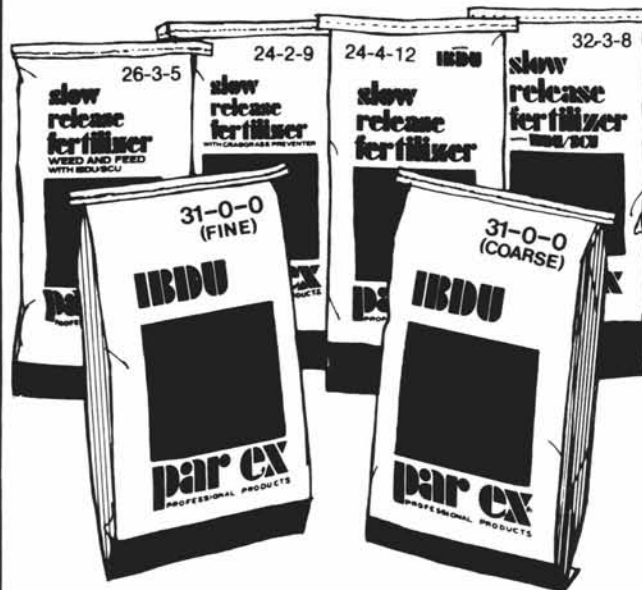
Today's systems are usually pressurized continuously. The control points in the systems are now at the sprinkler, subjecting all piping components in the system to maximum surges. The flexibility in control systems allows an operator to put water anywhere in the system every few minutes. Without adequate precautions, very high velocities can be generated, leading to high pressure surges. Also, valve-in-head sprinklers often close quite rapidly, creating sudden changes in velocity at the sprinkler. Pressure surges due to valve closure have been measured at over 60 psi in valve-in-head systems and the potential exists for even higher surges.

Early irrigation systems were constructed mainly of steel pipe ... Sprinkler swing joint assemblies were nearly always constructed with steel components. From a pressure capacity standpoint, the components had strength well beyond the stresses put on them. With plastics ... a given fitting or pipe used in an irrigation system is not nearly as strong as the steel counterpart it replaced.

NEXT MONTH: PVC STRENGTH CHARACTERISTICS AND TYPICAL PVC FITTING FAILURES

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