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Drinking Water Engineering and Science Discussions

Interactive comment on "Leakages and pressure relations: an experimental research" *by* F. De Paola and M. Giugni

F. De Paola and M. Giugni

depaola@unina.it

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In the presented experimental tests, carried out on a considerably wide pressure range (from 2 up to 7 bar), the water leakage has been reproduced using a small diameter pipe made in the same material (steel, cast-iron) of the main pipeline with an orifice at the downstream end. This layout results more suitable in representing a private connection in a water distribution network, where leakages due to metal pipe damages are more likely to occur. Anyway, at this early stage the experimental tests have been carried out on cast-iron and steel pipes for which, in the author's opinion, the influence of pressure on the leak size is not so meaningful. Nevertheless, the research has been performed in order to analyze the relationship between leakage discharge and supply pressure in both static and dynamic conditions, showing that in this case equation (1)

presents the same structure of the Torricelli equation. As highlighted in the conclusive remarks, in the author's opinion "For pipes characterized by high elasticity, then it would be appropriate to refer to an equation that takes into account the pressure/area link of the hole (such as FAVAD equation, Cassa et al., 2010). The analysis is made, however, further complicated by the viscoelastic characteristics of materials such as HDPE". These topics will be analyzed basing on further tests on pipes of different materials (HDPE, GRP), nowadays in progress at the Hydraulic Laboratory of Naples, , simulating the leakage through an orifice directly created in the pipe and measuring the discharge upstream and downstream by electromagnetic flowmeters.

Cassa, A. M., Van Zyl, J. E., and Laubscher, R. F.: A numerical investigation into the effect of pressure on holes and cracks in water supply pipes, Urban Water J., 7, 109–120, 2010.

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