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EFFECTS OF SOIL pH ON MECHANICAL PROPERTIES OF GLASS REINFORCED PLASTIC PIPES

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Abstract

Influence of soil pH on the mechanical characteristics of glass reinforced plastic (GRP) pipes type was often investigated in different situations encountered in the field. GRP degradation is directly proportional to the exposure to soil with non-neutral reaction. The theoretical and experimental results lead during time to design standards, which allow the application of GRP pipes in water and soil, so as minimum interferences with the materials used in the manufacture of pipes would appear. Samples of GRP pipe of a certain size are buried in the different areas of the field where the pH is alkaline, acidic, or neutral. After 24 months, samples were dug up / recovered and then subjected to laboratory determinations in GRP pipe factory Subor in Turkey in July 2016, and in Dresden Amitech Factory Laboratory in September 2016. Some other analyses were performed in the OSPA, Iași, Romania Laboratory. For the analysis of such large volume of experimental data, we used the Pearson correlation coefficient. The dependencies among variables were quantified by proposing the index pipe damage. The degradation of the pipeline is directly proportional with the difference between the actual value of soil pH and the neutral pH value. The mechanism of degradation is different in basic and acidic soils. The results obtained in this study can be used in practice to avoid the negative effects of the types of land on GRP pipes behavior.

Key words: circumferential stress, GRP pipes, type of soil, water transport pipe

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