
A Turbulence-Altering Pseudo-Surface for Enhancing the Flow in Pipes

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In the present work, a new, additive-free technique for enhancing the flow in pipelines is introduced. This technique utilizes an inserted turbulence-altering pseudo-surface, with certain dimensions inside of the pipe (adjacent to the inner wall). This technique is meant to investigate the viscoelastic behavior of soluble additives to enhance the flow in pipelines. A liquid circulation system with a testing section divided into four subsections was used to test the drag reduction effect of the new technique. The results showed that nearly 60% flow enhancement is achievable when inserting 12 strips with lengths of 60 cm into a 0.0381-m diameter pipe.

Keywords: Drag reduction; Friction; Pipelines; Pseudo surface; Turbulence