

## **Effects of Pipe Curvature and Internal Pressure on Stiffness and Buckling Phenomenon of Circular Thin-Walled Pipes**

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**Abstract :** A parametric study on circular thin-walled pipes subjected to pure bending is performed. Both straight and curved pipes are considered. Ratio  $D/t$ , initial pipe curvature and internal pressure are the parameters varying in the analyses. The study is mainly FEA-based. It is found that negative curvatures (opposite to bending moment) considerably increase stiffness and buckling limit of the pipe when no internal pressure is acting and, similarly, positive curvatures decrease the stiffness and buckling limit. For internal pressurised pipes the effects of initial pipe curvature are less relevant. Results show that this phenomenon is in relationship with the cross-section deformation due to bending moment, which undergoes relevant ovalisation for no pressurised pipes and little ovalisation for pressurised pipes.

**Keywords :** buckling, curved pipes, internal pressure, ovalisation, pure bending, thin-walled pipes

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