

Study of the Behavior of Bolted Joints with and Without Reinforcement

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Abstract : Many methods have been developed for characterizing the behavior of bolted joints. However, in the presence of a certain model of stiffeners, no orientation was given in relation to their modeling. To this end, multitude of coarse errors can arise in the reproduction of the propagation of efforts and in representation of the modes of deformations. Considering these particularities, a numerical investigation was carried out in our laboratory. In this paper we will present a comparative study between three types of assemblies. A non-linear 3D modeling was chosen, given that it takes into consideration geometric and material non-linearity, using the Finite Element calculation code ABAQUS. Initially, we evaluated the influence of the presence of each stiffener on the "global" behavior of the assemblies, this by analyzing their Moment-Rotation curves, also by referring to the classification system proposed by NF EN 1993- 1.8 which is based on the resisting moment M_{j-Rd} and the initial stiffness $S_{j,int}$. In a second step, we evaluated the "local" behavior of their components by referring to the stress-strain curves.

Keywords : assembly, post-beam, end plate, nonlinearity

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