

# Moment-rotation behavior of welded HSS tubular T joints

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## ABSTRACT

The field of applications of tubular structures covers a large range of structures, such as bridges, lattice masts, buildings and large openings. Hollow sections loaded by bending moment are found as a beam-column connection or as a simple joint configuration in a Vierendeel girder. High strength steels (HSS) allow to reduce the sections of constructions, however their economic efficiency remains questionable due to high material and manufacturing costs. Nowadays very few research has been conducted to explore the moment-rotation behavior of welded joints made of HSS. This article presents the results of 17 tests performed to observe the moment-rotation relationship and ductility of the joints. The experimental data is compared to the results of comprehensive finite element modeling (FEM) and manual calculation according to the Eurocode.

## MAIN RESULT

The method for calculation of the moment resistance proposed in (EN 1993-1-8, 2005) allows getting rather safe results, the average  $M_{j,Rd} / M_{u,exp}$  ratio is 0.61 (Fig. 1). Applying the correlation coefficient related to HSS makes the results very conservative ( $M_{j,Rd}^* / M_{u,exp}$  ratio 0.50). This fact shows that there is no need to reduce the moment resistance of HSS joints.

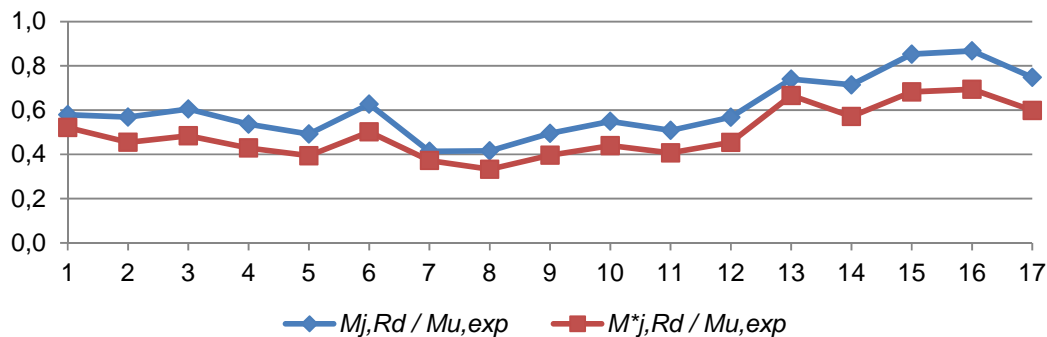


Figure 1.  $M_{j,Rd} / M_{u,exp}$  and  $M_{j,Rd}^* / M_{u,exp}$  ratios.