

Analysis of the brace axial rigidity of CHS KXX-joints with straight-pipe-cone-head

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ABSTRACT

The CHS (circular hollow steel) KXX-joints with straight-pipe-cone-head is a compact solution for large span spatial structures owing to the economical attractiveness and practical simplicity. The central part of joint is core tube and hollow cone of head cutting. In this paper, the behavior of the joints is investigated by finite element analysis. Based on the analysis of several groups of the joints covering a practical spectrum of parameters, the relationship between the main parameters and the bearing capacity is obtained. The variation rules of the axial rigidity of the joints with different parameters are summarized. The suggestion is referred to parametric analysis of the brace axial rigidity of the KXX-type tubular joints. With the method of linear regression, the formulas of characteristic values of curves were obtained. The dimensionless parameters of rigidity factor and bearing capacity factor were proposed. The comparison between finite element results and results of equation of calculation shows that the proposed model can predict the brace axial rigidity of the CHS KXX-joints with straight-pipe-cone-head with satisfactory accuracy.