

## The analysis of mechanical properties of flange type bolted joints for different diameter steel tubes

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### SUMMARY

For the joints between steel tubes of the steel tubular structure, flange joints using the bolts are usually adopted. The joint of the same diameter steel tubes is used in fields of the buildings and many experimental studies are accomplished, and a design method is established.

However, about the design method of joints between the different diameter tubes, the standards are not found.

It is common for actual body experiment for searching for the property of the joints such as steel tubular structure, to be difficult, and for execution even by an experiment with a small model to be difficult.

Moreover, if can imagine easily that experiment cost costs deadly.

The computer analysis by finite element methods as a method for the mechanical property of the joint for it is relatively easy.

I demand the mechanical property of the joint for the flange plate that is plane without the reinforcement rib, and it is that a decided clue gets appropriate shape and dimensions.

Since the diameter ratio of the steel tubular joints, flange diameter, flange plate thickness, a size and a grade of bolts, etc. were considered to govern the mechanical properties, they presupposed that the strength and the rigidity of joint are analyzed in consideration of them.

By this report, I found strength and rigidity for the junctions where 12 and 16 bolts placed, the diameter of steel tube ratio about two kinds and demanded the shape dimensions of an appropriate flange joint and decided to get the results which helped a joint design.

In addition, I introduce other analysis cases of the joint of a steel tube varying in the diameter. It is the analysis about an outside flange joint with ribs between different diameter tubes. As for the next, the small diameter tube has an outside flange and the large diameter tube has an inner flange.