ENGLISH SUMMARY

Hassinen, Paavo, Kouhi, Jouko, THE USE OF EFFECTIVE WIDTHS IN DIMENSIONING STEEL STRUCTURES AGAINST BUCKLING

In the design of steel structures effective widths for plates, which are loaded by compression forces or compression forces and bending moments, are widely used. In the article the theoretical basis of effective widths is studied and the most used formulae in some design codes are introduced. Further some numerical examples based on the nonlinear analysis and the calculation models of design codes are presented.

Ikonen, Kari, THE EFFECT OF PRESSURE PULSES IN PIPINGS

Simple formulas for calculating pressure pulses and their effect in pipings are presented in the article. The basic equation for calculating pressure is derived by energy balance considerations and the effect of the flexibility in pipe wall is presented. Branching of pressure pulses in contraction and expansion places and joints is considered. Lateral forces in elbows due to pressure pulses and the effect of gas in the liquid is discussed.

Koivula, Risto, TORSION IN STRUTS OF OPEN CROSS-SECTION WITH RIGID LONGITUDINAL RESTRAINTS

The deformations of so-called free deformable struts of open cross-section can be expressed comprehensively by means of four displacements, which are the elongation v_z, the bending deflections of the torsional axis, which equals with the shear axis, v_x and v_y, and the torsional angle θ.

When deformations of a strut os open cross-section are restrained by rigid longitudinal restraints, which eliminate one or several transversal of longitudinal degrees of freedom, we can in many cases prove, that to the strut exists a torsional exis, in the sense of flexural axis, through which loaded strut does not warp and in the sense of axis of twist, around which the strut rotates in torsion without bending, and the location of this torsional axis differs usually from the location of the shear axis of the strut. Also in many cases, when the restraints take longitudinally directed shear crafts, exists an axis, named in this article 'elongational axis', along which the strut can be loaded in longitudinal direction without causing bending, and the location of this axis differs from that of the centroid axis. The equations between loadings, normal forces, bending moments, bimoments and deformations are adviceable to set and solve in that kind of system of cross-sectional coordinates, in which the origin of the coordinate axes is located on the elongational axis and the generic point of the sectorial coordinate on the torsional axis. To solve the connection forces in the restraints, bending moments, bimoments and deformations solved in this system of coordinates can be transformed to the usual system of coordinates in which the origin of coordinate axes is located on the centroid and the generic point of the sectorial coordinate on the shear axis. The transformations may be done by means of transformation matrixes given in this article.