

ENGLISH SUMMARY

UDK 624.044:678-462:539.37

POPOV, A.I. and KOSKI, L., Surface Layer Technique in the Determination of the Initial Deformation State in Plastics Pipes.

Initial deformations appear in plastics products like plastics pipes as result of the manufacturing process. In this paper is discussed the use of the surface layer technique with photo-elastic coating for the determination of these deformations. The method is based on the release of the deformation upon heating. The method is visualized by an example.

UDK 624.042.41:534.1

KÄRNÄ, TUOMO, LAIHO, JORMA, LEHTONEN, PERTTI, Determination of structural damping from the autocorrelation for wind-induced vibrations.

A correlation technique for evaluation the natural frequencies and damping ratios of structures is described. The method is based on the theory of random vibrations. It involves applying a broad band noise excitation and an advantage of the method is that the gusty wind can be used for this purpose. The natural frequencies are derived from the response spectral density and the damping ratios for the lowest modal components from the corresponding autocorrelation functions which take the form of an exponentially decaying periodic function.

UDK 624.042:519.6:539.422

IKONEN, KARI, J-integral in fracture mechanics.

The article presents the mathematical and physical background of the J-integral, which is nowadays widely applied especially in nonlinear fracture mechanics. Formulae for calculating the J-integral by two dimensional isoparametric finite elements are presented. It is also shown how the stresses due to a nonuniform temperature field are taken into account. Special considerations are needed if the thermal expansion coefficient changes discontinuously in the integration area.