

PREDICTION OF LIFE OF 12X18H10T STEEL IN ISOTHERMAL CREEP IN UNIAXIAL TENSION

The paper deals with a method of prediction of the structural material life in isothermal creep in uniaxial stationary loading, based on a strained failure criterion, which suggests that a limited state of material is measured by a critical value of the stored creep strain. The determining creep equations are stochastically linearized. It allowed an analytical determination of the basic distribution characteristics of creep strain and construction of a stochastic failure model of the 12X18H10 corrosion-resistant steel.

Keywords: structural material life, isothermal creep, uniaxial stationary loading, strained failure criterion, 12X18H10T corrosion-resistant steel, stochastic failure model.

1. *Rabotnov Yu. N.* Creep of Structural Members / *Yu. N. Rabotnov.* – Moscow: Nauka, 1966. – 752 p.
2. *Poshivalov V. P.* On the approach to determination of failure time in creep (in Russian) / *V. P. Poshivalov* // Problemy Mashinostroenia i Nadezhnosti Mashin. – 1993. – No 3. – P. 56-60.
3. *Samarin Yu. P.* Evaluation of reliability of rod structures on the criterion of deformation type (in Russian) / *Yu. P. Samarin, G. A. Pavlova, N. N. Popov* // Problemy Mashinostroenia i Nadezhnosti Mashin. – 1990. – No 4. – P.63 – 67.
4. *Doyar I. A.* Version of probabilistic estimation of failure time in creep (in Russian) / *I. A. Doyar, V. P. Poshivalov* // Tekhnicheskaya Mekhanika. – 2013. – No 2. – P. 99 – 108.
5. *Lokoshchenko A. M.* Technique for describing creep and long-term strength in pure tension (in Russian) / *A. M. Lokoshchenko, S. A. Shestirikov* // Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki. – 1980. – No 3. – P. 155 – 159.
6. *Sosnin O. V.* Determination of parameters of creep curves at all stages of creeping (in Russian) / *O. V. Sosnin, A. F. Nikitenko, B. V. Gorev* // Strength Calculations and Tests. Calculating Techniques of Determination of Carrying Capacity and Life of Members of Machines and Structures. Method of Determination of Parameters of Creep Curves and Failure Storage in Uniaxial Loading: Methodic Recommendations. – Moscow: VNIINMASH, 1982. - P. 29 – 37.
7. *Radchenko V. P.* Evaluation of reliability of structural members in creep on the base of generalized stochastic models (in Russian) / *V. P. Radchenko, M. V. Shershneva, S. N. Kubyshkina* // Transactions of Samara State Technical University. Series of Physic and Mathematical Sciences. – 2012. – No 3(24). – P. 53 -54.
8. *Zorich V. A.* Mathematical Analysis. Part II (in Russian) / *V. A. Zorich.* – Moscow: MTsNMO, 2002. – 794 p.