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AUTHOR: Chayevskiy, M. I.

TITLE: The effect of cyclic deformation rate on the fatigue strength of steels affected by low-melting metal melts

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut mashynoznavstva i avtomatyky, L'viv. Nauchnyye zapiski. Seriya mashinovedeniya. v. 9, 1962, Voprosy mashinovedeniya i prochnosti v mashinostroyenii, no. 8, 30 - 33

TEXT: To eliminate embrittlement of steel in contact with low-melting metal melts, the author studied the possibility of preventing the diffusion of the melts into the volume of the steel specimen by reducing the deformation rate in cyclic loading. Steel specimens were subjected to cyclic torsion tests in air and in low-melting metal melts. It was observed that the torsion of normalized 50 grade steel specimen in Pb-Sn eutectic melts at 400°C reduced strongly the cyclic strength as compared to tests performed in air at a loading rate as high as 4.6 radian/min. A sharp decrease of the deformation rate down to 1.7 radian/hour caused the complete insensitivity of the specimens to the effect of

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the melt; they withstood the same number of cycles as in air. On the basis of the experiment performed, a method was developed to establish safe conditions of cyclic loading for steel affected by the aforementioned melts. It is concluded that an extended effect of surface-active substances on metals does not always impair but may improve their mechanical properties, in particular, ductility. There are 2 figures.

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