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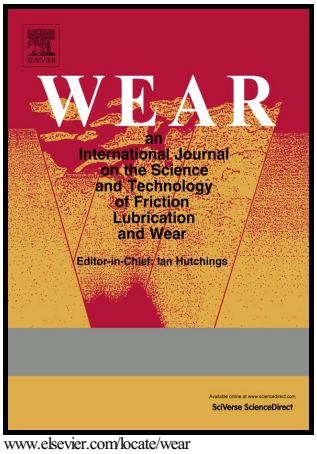

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Cavitation Damage : Theory and Measurements – A Review

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Abstract

This paper reviews the work done to understand cavitation damage. The paper covers the theoretical formulation of cavitation bubble collapse and the estimate of bubble collapse pressure, the techniques for measurement of cavitation damage in the laboratory and the special facilities for measurement of cavitation damage in sodium, the instrumentation for measurement of collapse pressure during cavitation as well as the work done in predicting damage from material properties. The paper also discusses the work done on cavitation damage in liquid sodium and concludes with a discussion on reasons for the limited success in achieving good damage prediction.

Nomenclature

A	area of specimen face, mm^2
A_o	membrane surface area of a reference sensor, mm^2
a_c	projected radius of the indentation, mm
B	Bulk modulus, N/m^2
B_{eff}	dimensionless
b	fatigue strength exponent
C	velocity of sound, m/s
c_L	Specific heat of the liquid, J/kg-K (BTU/lbm-$^{\circ}$F)
C_1, C_2, C3, C_4	material dependent constants
D	pit diameter, μm
D*	characteristic pit equivalent diameter, μm
d	diameter of the cavitation pit, mm