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NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER ANNAPOLIS MD

(U) A Decade of Low-Cycle Fatigue Testing of Large-Scale High-Strength Steel Weldments.

DESCRIPTIVE NOTE: Summary rept.,

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PERSONAL AUTHORS: Macco, J. G. ;

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the fatigue resistance of Ti-6Al-6V-2Sn. Only 'Tibon' Chromium Plate and 'Tiodize II' anodize improved the as-machined fatigue resistance. In Task 5, the effect of environmental factors was tested and it was shown that salt deposits in the faying surfaces led to fretting failures. In Task 6, selected coatings were tested in fretting-fatigue. Shot - preening, anodize with solid lubricant, and epoxy primer alleviated fretting-fatigue under certain conditions.

DESCRIPTORS: (U) (*TITANIUM ALLOYS, *CORROSION INHIBITION), (*COATINGS, TITANIUM ALLOYS), (*AIRFRAMES, CORROSION INHIBITION), SURFACES, FINISHES, FATIGUE(MECHANICS), FAILURE(MECHANICS), TORQUE, FASTENINGS, LOADS(FORCES), SALTS, DEPOSITS, COLD WORKING, LUBRICANTS, SOLIDS, EPOXY RESINS

IDENTIFIERS: (U) *FRETTING, TITANIUM ALLOY 6AL 4V, TITANIUM ALLOY 6AL 2SN 6V, TITANIUM ALLOY 6AL 6MO 2SN 4ZR, SHOT PEENING

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IAC DOCUMENT TYPE: MCIC - HARD COPY --

IAC SUBJECT TERMS: M--(U)MPDC, TI-6AL-6V-2SN, TI-6AL-4V, TI-6AL-2SN-4ZR-6MO, TITANIUM ALLOYS, COATINGS, CHROMIUM COATINGS, FLUORIDE COATINGS, CONVERSION COATINGS, EPOXY COATINGS, SHOT PEENING, ANODIZING, FRETTING, CORROSION, SALT SPRAY, SURFACE FINISH, FATIGUE PROPERTIES, LOADING, JP-4 FUEL, TEMP 0 TO 99 C, TEMP 100 TO 299 C, AIRFRAMES., ;

3 Distribution limited to U.S. Gov't. agencies only; Test and Evaluation; Aug 72. Other requests for this document must be referred to Commander, Naval Ship Systems Command, Attn: SHIPS-03423. Washington, D. C. 20360.

ABSTRACT: (U) Information and data, accumulated over the past decade, on low-cycle fatigue behavior of large-scale HY-80, HY-100, and HY-130 steel weldments and on the effects of various postweld treatments are presented. Baseplate, tee- and butt-welded fatigue specimens are covered, in addition to postweld treatments such as mechanical peening, shot peening, stress relieving, grinding, and overstraining. The information will be especially useful to designers of welded structures that are subjected to repeated loads such as submarines and surface ships. (Author)

DESCRIPTORS: (U) (*STEEL, *FATIGUE(MECHANICS)), (*WELDS, *FATIGUE(MECHANICS)), COLD WORKING, GRINDING, SUBMARINE HULLS, TEST METHODS, LOADS(FORCES)

IDENTIFIERS: (U) MECHANICAL PEENING, OVERSTRESSING, SHOT PEENING, STEEL HY-130, STEEL HY-100, STEEL HY-80

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IAC SUBJECT TERMS: M--(U)HY-80, HY-100, HY-130, Welds,

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