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Brief 68-10184

NASA TECH BRIEF

Stress-Corrosion Characteristics of Aluminum Casting Alloy M-45

Aluminum alloy M-45 was developed primarily as a lightweight structural casting metal with high tensile, yield, and impact strengths at cryogenic temperatures. The composition and mechanical properties of this alloy are given in Tech Brief 65-10092. Tentative results of an experimental study undertaken to arrive at a heat-treatment cycle which would optimize both the strength and stress-corrosion resistance of M-45 are discussed in Tech Brief 67-10159.

In a recent investigation, the stress-corrosion characteristics of the M-45 aluminum alloy were evaluated for the nine aged conditions considered, from the earlier study, as most promising with regard to a combination of optimum strength and stress-corrosion resistance. The only specimens stressed to 75 percent of the yield strength which did not display stress corrosion cracking were those artificially aged at 400°F for 12 hours. Stress-corrosion cracking was evident in 4 of 6 specimens artificially aged at 375°F for 26 hours. It is concluded from this investigation that the most favorable artificial aging cycle for this alloy, with regard to optimum strength and stress-corrosion resistance, appears to be 400°F for 12 hours. The practice of aging at 375°F for 26 hours does not result in an optimum combination of strength and stress-corrosion resistance.

Note:

Complete details of this investigation may be obtained from:

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Reference: B68-10184

Patent status:

No patent action is contemplated by NASA.

Source: C. V. Lovoy
(MFS-14817)

Category 03