NASA TECH BRIEF

Lyndon B. Johnson Space Center

High-Strength Rivet Does Not Require Aging

The problem:

Conventional rivets used in the manufacture of aircraft require high-temperature and high-shear properties. They are kept in cold storage (aged) at approximately -18° C (0° F) temperature and must be installed within 2 hours after removal from the cold storage. This makes their handling inconvenient.

The solution:

A new aluminum rivet is simpler to handle. It does not need aging and provides better high-temperature and shear properties than conventional rivets.

How it's done:

The new rivet can be used at temperatures up to 180° C (350° F); conventional rivets are limited to temperatures below 120° C (250° F). The new rivet is constructed from 2219-aluminum alloy and is heat treated to condition T62. It has been designed with flush, flush shear, and universal heads. Double-shear tests show the rivet has a shear strength of 2.21×10^8 N/m^2 (32 ksi). The new rivets are capable of being driven with a minimum head diameter of 1.4 rivet diameters and a minimum head height of 0.3 rivet diameters. Tests at the upset height of up to 1.7 diameters have shown the rivets to have exceptionally good crack resistance.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Johnson Space Center
Code AT3
Houston, Texas 77058
Reference: TSP75-10044

Patent status:

NASA has decided not to apply for a patent.

Source: J. F. Charles of
Rockwell International Corp.
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Categories: 06 (Mechanics)
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