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NASA TECH BRIEF



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Stress Calculator Speedily Converts Strain Data

In large test programs, in which many portions of the structure are checked for stress, computerized programs are established for obtaining strain readings from the test specimen and rapidly converting these strains into usable stresses. In small programs, computers are impractical or are economically infeasible so that strain data must be reduced to stresses in a cumbersome and time consuming manner by the engineer.

A device is described that permits speedy conversion of strain data directly into maximum and minimum stresses with few operations and also determines stress direction. The stress calculator may be made in any convenient size for use in the field and may be easily manipulated.

The calculator consists of several parts: A movable slide containing two basic scales—a lower (logarithmic) scale used for multiplication, and linear scales consisting of any reasonable number of varied-value scales used to locate the center of a scribed circle; an information and grid board that may be ruled in any convenient increments, with an information section to contain all pertinent constants and other necessary or

useful information, in addition to an angular scale used to determine the directions of the principal stresses; and finally, a logarithmic scale used in conjunction with the aforementioned lower scale for multiplication. The final items are a rotating beam and sliding cross hair used to determine the radius of a scribed circle and the angles of principal stresses, plus a linear scale used to determine maximum shear stress.

Note:

Inquiries concerning this innovation may be directed to:

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Patent status:

No patent action is contemplated by NASA.

Source: Doyle W. Cornett
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