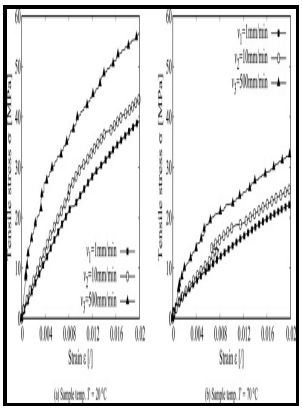
Combined finite-element/reference stress design method for creep in components

National Engineering Laboratory - Design for creep: A critical examination of some methods



Description: -
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Strains and stresses.
Materials -- Creep.combined finite-element/reference stress design method for creep in components
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Etudes sur le Massif Central
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NEL report -- no. 718combined finite-element/reference stress design method for creep in components
Notes: Includes bibliography.
This edition was published in 1990

Tags: #Integrity #Assessments #of #Components #in #the #Creep #Range

Determination of fracture mechanics parameters J and C* by finite element and reference stress methods for a semi

Comparisons are made with solutions taken from the literature for a range of loading conditions, plate geometries and crack sizes and shapes. Because RBFs are not necessarily located in a structured manner, the parametrized level set method can be combined effortlessly with unstructured polygonal finite element meshes to easily handle complex design domains and also achieve the high accuracy characteristic of polygonal discretizations. The ingredients used for this are well-tried numerical techniques, combined with the concepts of continuum damage and so-called reference stresses.

Integrity Assessments of Components in the Creep Range

Figure 1 shows a schematic creep curve for a constant load; a plot of the change in length verses time.

MD: LESSON 5. STRESS CONCENTRATION AND CREEP

Reference stresses for combined loading with a power law; non-isothermal power-law creep; reference temperatures; and approximate reference stress methods are elaborated. The steam temperature always varies some from individual tube to tube, and the design allows for this variability. Creep may be defined as a time-dependent deformation at elevated temperature and constant stress.

MD: LESSON 5. STRESS CONCENTRATION AND CREEP

Thus, creep failures will include the degraded microstructures of graphite or spheroidized carbides along with the grain-boundary voids and cracks characteristic of these high-temperature, long-time failures. It is also intended that the same methods will be of value during operation if estimates of damage or if exercises in life extension are required. The text presents a phenomenological description of creep.

An Improved Creep

These individual voids grow and link to form cracks several grains long, and finally failure occurs.

Engineering C

Lead creeps at room temperature and figure 1.

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