A new 12% chromium steel strengthened by Z-phase precipitates - DTU Orbit (08/11/2017)

A new 12% chromium steel strengthened by Z-phase precipitates

In order to increase the corrosion resistance and simultaneously maintain the creep resistance of 9-12% Cr steels at 650 degrees C, a new alloy design concept was proposed, using thermodynamically stable Z-phase (CrTaN) precipitates to strengthen the steel. A new trial Z-phase strengthened 12% Cr steel was produced and creep tested. The steel exhibited good long-term creep resistance. Dense nano-sized Z-phase precipitates were formed at an early stage, and coarsened slowly. They remained small after more than 10,000 h. (C) 2015 Elsevier Ltd. All rights reserved.

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