

Materials for Advanced UltraSuper Critical Power Plants

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Abstract

Higher process temperatures and pressures are mandatory to increase net efficiency and reduce CO₂ emissions", to follow the results of the COPIT 2016 conference. As consequence of these more severe operating conditions require better materials with higher demands for development, manufacturing and fabrication. This paper summarizes the current status of the art of the materials for Ultrasupercritical coal fueled power plants and the trend for the development needed for the next generation called "advanced Ultrasupercritical" targeting >50% efficiency, where nickel base superalloys will be necessary for the hottest part of the plant.

This new generation of power plants will give an effort for the reduction of the CO₂ emission, because forecast confirm the coal will be the most relevant source for energy production at least for the next 30 years.

Biography

Augusto Di Gianfrancesco is a Graduate in Chemical Engineering at University of Rome "La Sapienza" in October 1982, with specialized background in material science.

Current position:

- Materials and technologies consultant at Compusystem (www.compsyst.it)
- Chairman of ECCC (European Collaborative Creep Committee)
- Vice-president of Center of Study Materials for Energy of Italian Society of Metallurgy (Associazione Italiana di Metallurgia)

Dr Augusto Di Gianfrancesco was employed at the Centro Sviluppo Materiali (CSM), Rome, Italy since February 1983 until December 2014. He holds Senior Metallurgist and Project Leader positions on "High Temperature Materials". He was responsible for R&D activities on steels and superalloys for high temperature applications in

power generation plants. He was also member of Management Committee of EU Program COST 522-536, co-founder of the European Creep Collaborative Committee and co-founder of the Italian Working Group on Creep Resistant Materials. In addition he has been member of the International Board of the 5th, 6th & 7th EPRI International Conferences on Advances in Materials Technology for Fossil Power Plants, METAL2013/4/5/6/7/8, the 6th International Conference on Creep, Fatigue and Creep-Fatigue Interaction, and vice chairman of the 3rd ECCC Conference held 2014 in Rome. He is author and/or co-author of more than 280 technical reports and more than 100 papers presented in national and international conferences or magazines.

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