

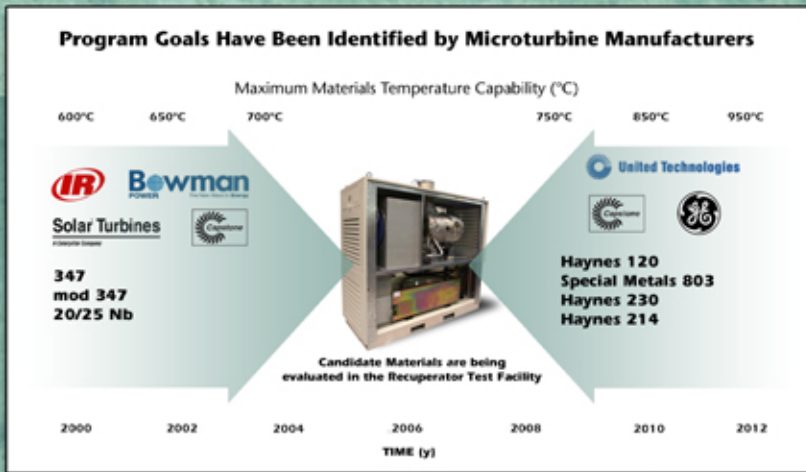
# Recuperator Materials Development

Higher-temperature recuperator materials with improved creep and oxidation-resistance are being developed for use in today's microturbines and industrial gas turbines as well as higher temperature, more efficient microturbines being developed by Capstone, Ingersoll Rand, GE, and United Technology Research Center.

## Short Term

Low-cost materials with improved creep resistance and durability are being developed for use to 700°C in today's turbines and microturbines

Cost <1.5 x (cost of 347 steel (\$))

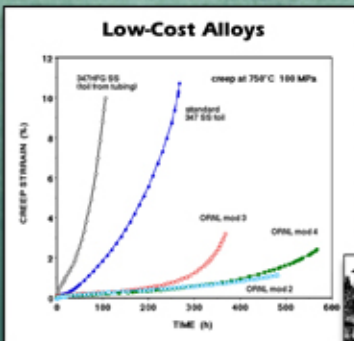


## Long Term

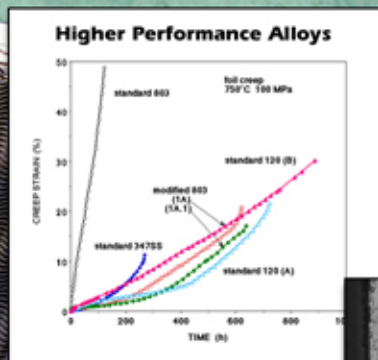
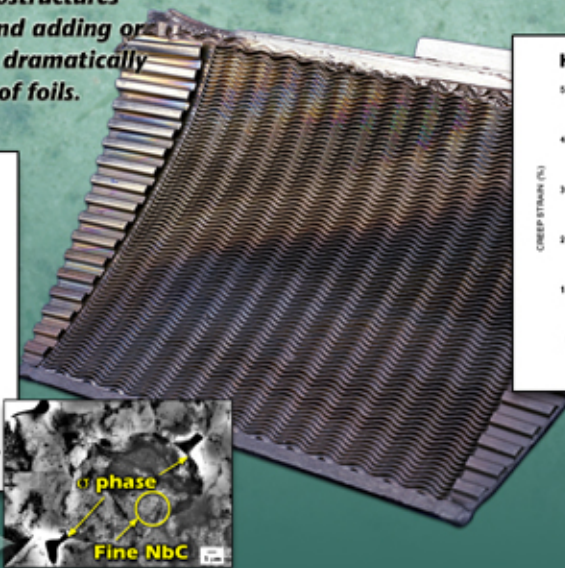
Materials with improved creep and corrosion resistance are being developed for use at 750-900°C in the U.S. DOE Advanced Microturbine Systems

Cost between 3-9 x (cost of 347 steel (\$))

Alloys with "Engineered Microstructures" (controlled large grain size and adding or removing precipitate phases) dramatically improve the creep resistance of foils.



Typical Standard 347 Steel Foil, Exposed to High Temperature.



ORNL As-processed Foil with Controlled Grain Size

Collaboration Between Materials Producers, End Users, and ORNL has Spurred the Development of Improved Recuperator Foils with Engineered Microstructures

Materials R&D Capabilities and Expertise



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