

## **Development of Next Generation Glass Forming Wire-Arc Coatings for Elevated Temperature Erosion Environments**

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New low cost iron based glass forming alloys have been developed for elevated temperature erosion / corrosion protection of water wall, superheat and reheater exchange tubes and other surfaces in biomass, circulatory fluidized bed (CFB), and coal fired boilers. When thermally sprayed using the twin roll wire-arc process, the resulting coatings are found to exhibit high coating density with excellent bond strength. The coating microstructures, due to their excellent glass forming ability, are found to be primarily amorphous with localized regions of partially devitrified nanoscale borocarbide phases. Because of this unique structure, the coatings are found to exhibit excellent room temperature and elevated temperature hardness, high resistance to localized corrosion, and superior performance in elevated temperature erosion. In this talk, the properties of the newly developed coatings will be compared to those of other boiler coatings, other coating application strategies, and bare tubes.