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TMS 2017
146th Annual Meeting & Exhibition



February 26 – March 2, 2017
San Diego, California, USA

GAMMA (FCC)/GAMMA-PRIME ($L1_2$) CO-BASED SUPERALLOYS II

The first report of a stable γ' - $L1_2$ phase in the ternary Co-Al-W system in 2006 has given rise to significant research on a new class of precipitation-strengthened alloys, analogous to Ni-based superalloys, which are most often utilized in high-temperature turbine engine components. These materials exhibit a yield stress anomaly similar to their Ni-based counterparts, where the yield strength increases with temperature, and demonstrate promising high-temperature flow stress behavior and creep resistance, outstanding wear resistance, and potentially better castability. However, some challenges still exist in the development of future industrially relevant Co-based γ' -strengthened alloys, including increasing γ' solvus temperature, improving environmental resistance, and decreasing component weight critical to many turbine engine applications.

This symposium continues in the tradition of the first TMS symposium on γ - γ' Co-based superalloys held in 2014 and will bring together the growing community of researchers involved with further understanding and developing γ' strengthened Co-based superalloys for high temperature and other applications. Experimental and computational investigations on Co- and Co-Ni-based alloys that focus on understanding materials response, use ICME-based approaches, and aid in rapid alloy development will be highlighted. Topics of interest include strategies for increasing the γ' solvus temperature, improving environmental resistance, evaluating high-temperature mechanical performance, assessing phase stability and phase transformation mechanisms, and advancing processing methods of these promising new materials.

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