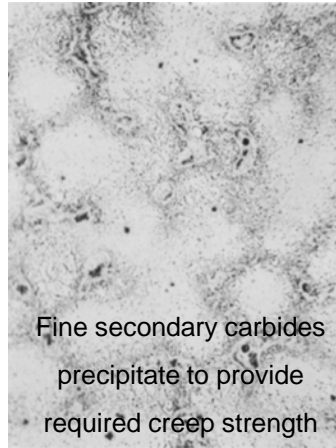


Large primary carbides
in austenite matrix

As Cast



Fine secondary carbides
precipitate to provide
required creep strength

1600 °F for 2120 hrs

Problem

Can be difficult to achieve acceptable tensile properties in HH grade castings. The HK and HP grades are susceptible to cracking during welding and riser removal.

Objectives

- Identify the influence of cooling rate and composition on intergranular carbides and associated cracking in HP and HK casting alloys.
- Identify the cause of reduced tensile properties in HH Type II casting alloys.
- Develop guidelines for avoiding cracking and meeting tensile properties.

Benefits to Warfighter

- Improved performance and decreased cost of steel castings
- Strengthened supply chain through advancements in austenitic alloy production

Description of Project:

This project will enhance heat-resistant austenitic steel grade properties to improve performance, reduce the scrap/rework resulting from the elimination of false positive indications, and strengthen the supply chain through the advancement in austenitic alloy production.

Team:

Lehigh University, Steel Founders' Society of America



Milestones / Deliverables

- HK and HP Grades: Establish influence of alloy composition and section size on phase balance and cracking susceptibility (through Gleeble hot ductility testing and welding trials)
- HH Type II Grade: Establish influence of phase balance on tensile properties (possibly establish limits for section size)
- Dissemination of processing guidelines and results to industry via committee meetings, professional conferences, and publications

