

AME6: Microstructural Contributions to Thermal Fatigue Properties of Grey Iron Brake Components

Team Composition: MSE

Sponsor: Meritor



Project Description: Meritor is a global leader in providing innovative drivetrain mobility and braking solutions for original equipment (OE) manufacturers of trucks, trailers, and specialty vehicles, as well as related aftermarkets in the transportation and industrial sectors. Meritor is the worldwide braking leader for the commercial vehicle industry, supplying more than two million brake assemblies per year. Designs for braking components have revolved around gray iron mainly due to its ability to quickly dissipate frictional heat generated by braking. The high thermal conductivity of grey iron is primarily driven by the graphite morphology, with longer graphite flakes (Type A) producing higher thermal conductivity. Gray iron matrix microstructure is a secondary factor that has not been explored completely in conjunction with graphite flake morphology. AME is tasked to evaluate the various graphite morphologies and matrix micro constituents and their effects on thermal properties. Not only is high conductivity desired near the braking surface, but lower conductivity in the hub region would help to limit bearing temperatures.

