Microalloyed forging steels designed by the Basic Metals Processing Research Institute at the University of Pittsburgh were subjected to metallurgical analysis and experimentation, to determine optimal processing parameters for a new forging process, called Recrystallization Controlled Forging. This process utilizes forging passes at high temperatures which reduce die wear and allow for extensive grain refinement using repeated grain recrystallization. These steels incorporate controlled TiN technology for austenite grain refinement during reheat and forging and precipitation hardening by VCN in ferrite. Interrupted Direct Quenching and Indirect Accelerated Cooling is utilized to produce microstructures with multiple strength levels for each steel composition, based on bainitic or martensitic microstructures. Upon completion of characterization experiments, the investigated parameters were implemented to design thermomechanical processing paths for the creation of forged wheel hubs at Meadville Forging Company. Tensile strengths ranging from 100 KSi (ferrite-pearlite), 125 KSi (bainite) and 200 KSi (martensite) are expected in the final forgings. Financial and material support were provided by the Forging Industry Educational and Research Foundation and TIMKENSTEEL Steel Company. All experiments were conducted in cooperation with Engineers at industry partner company, Meadville Forging Company.