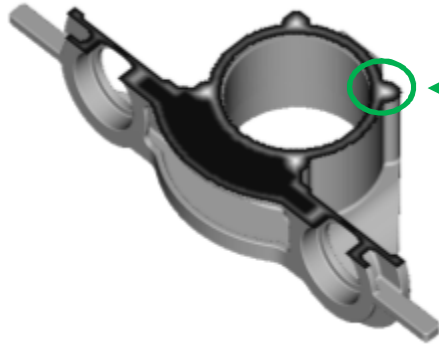
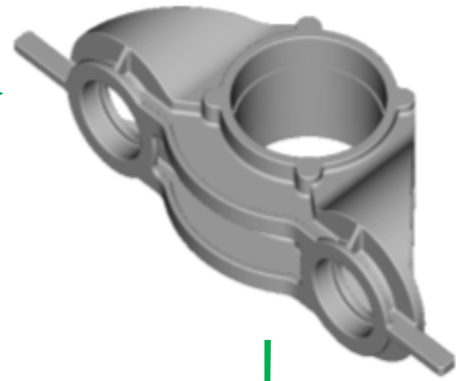


Axle Box Housing

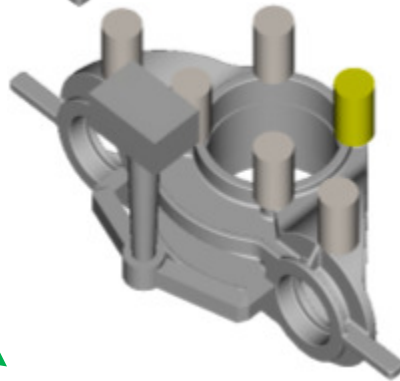
Cast Steel, Green Sand Casting

The cast steel axle box housing is used in railways. It is of overall size 1050 mm x 420 mm x 280 mm and weighs 92 kg. It is in regular production, and suffered from frequent rejections due to internal shrinkage porosity in central bore and under-neck porosity observed at machining stage.

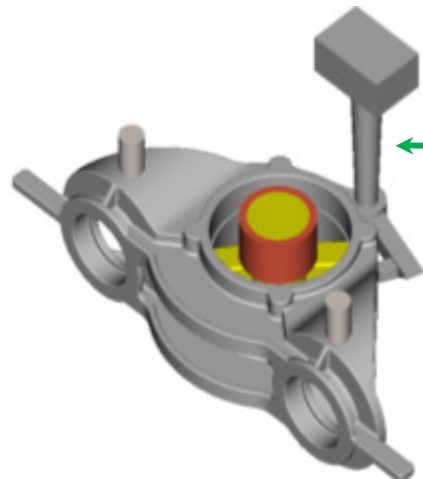
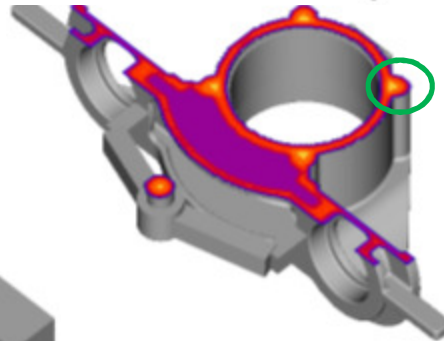


Thickness analysis of the part shows maximum wall thickness of 42 mm, connected to central bore region.

Current methoding of the casting includes eight top feeders of 80 mm diameter and height of 120 mm.



Solidification simulation reveals that the feeders are undersized, but they can not be enlarged due to the small size of the bosses on which they are placed. This results in shrinkage porosity formation which is exactly matching the defect in original casting.



An improved methods design uses a larger feeder of 120 mm diameter and 150 mm height placed in the core. It has four necks connected close to the defect locations. An exothermic sleeve is also used. Solidification simulation shows the hot spots in the defect area are minimized, and yield also improves slightly.

