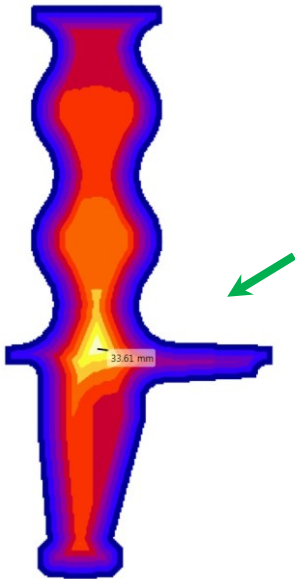
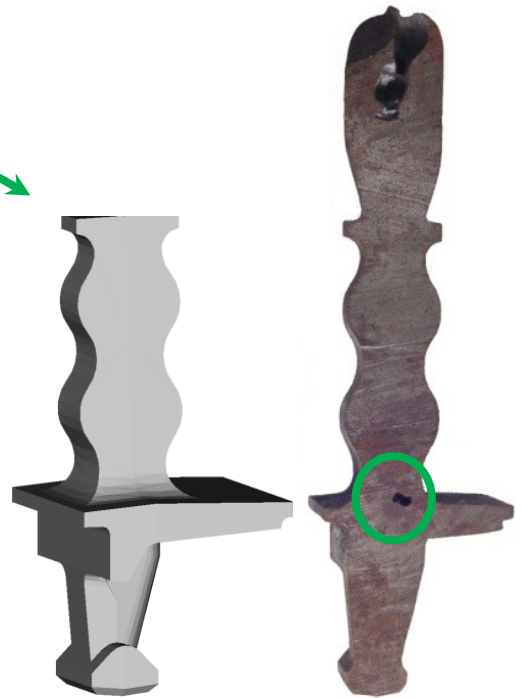


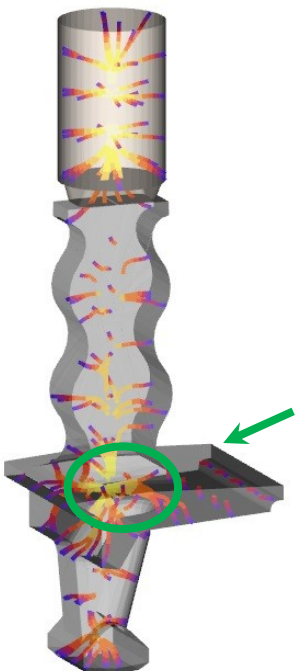
**Case:** The insert casting of overall size 76 mm x 82 mm x 176 mm weighing 1.4 kg was in production in a foundry with Disamatic line. The sectioned casting showed a shrinkage cavity.



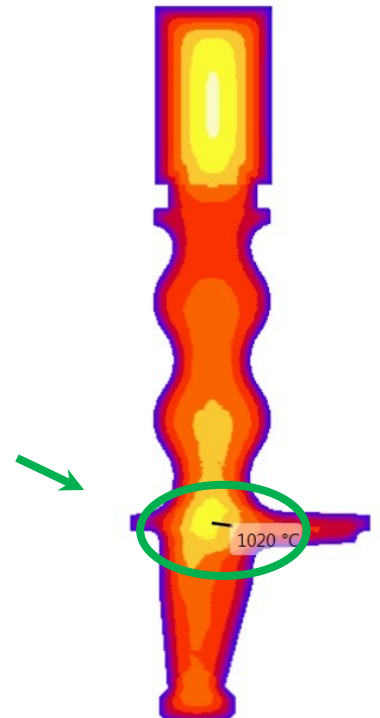
A 3D CAD model of the cast part was created and its wall thickness was analyzed. This showed a relatively thick region with inscribed sphere diameter of 34 mm.



The initial methoding of the casting included one top feeder of 40 mm diameter and 60 mm height.



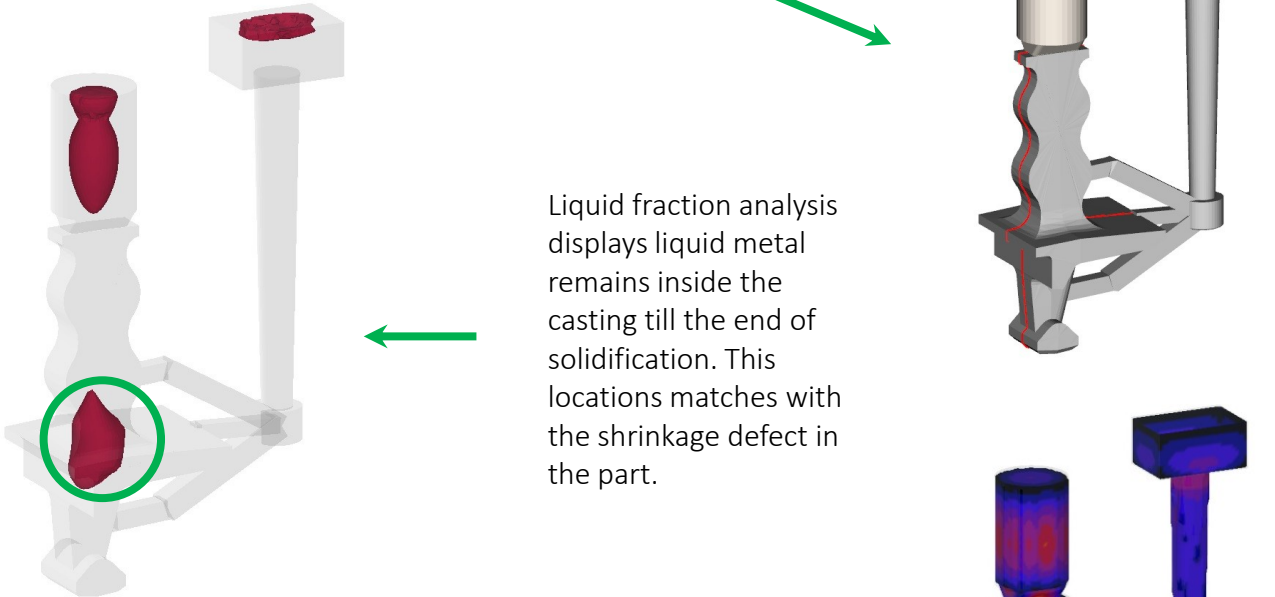
The feed path (left) and solidification (right) simulation of the part showed feed path convergence and isolated hotspot, at the junction, leading to shrinkage defect exactly matching the one observed in the casting.



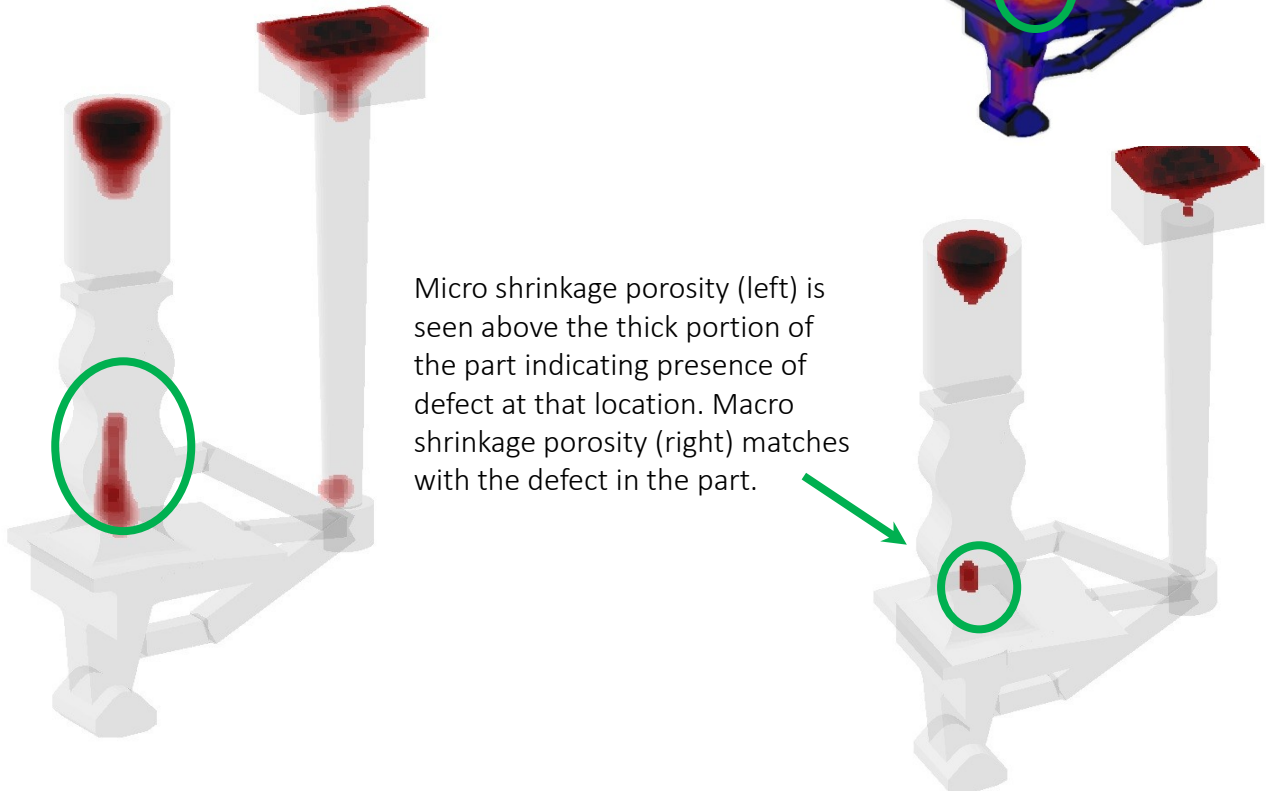
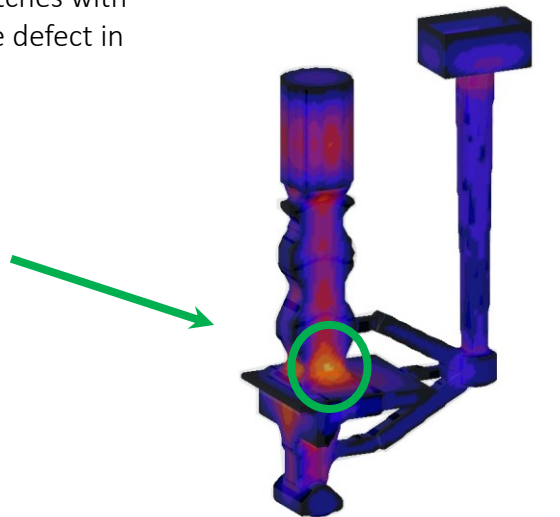
# Insert

# Ductile Iron, Disamatic Sand Casting

Initial gating system includes step gating connecting the upper and lower section of the part. Another gate is used to be connected to the thick section of the casting.



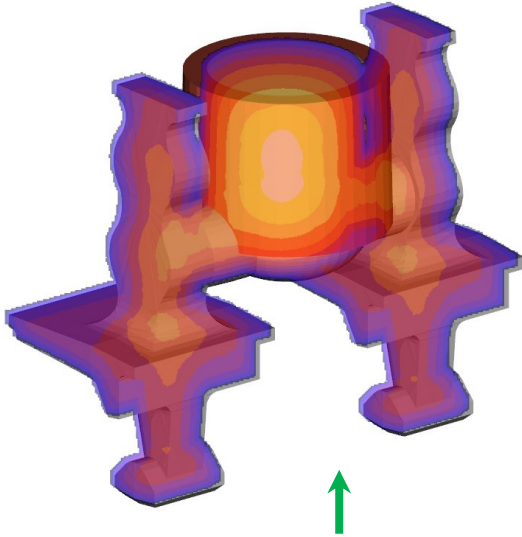
Solidification time shows the last solidifying region in the thickest section of the casting. The results correlate with the results from liquid fraction.



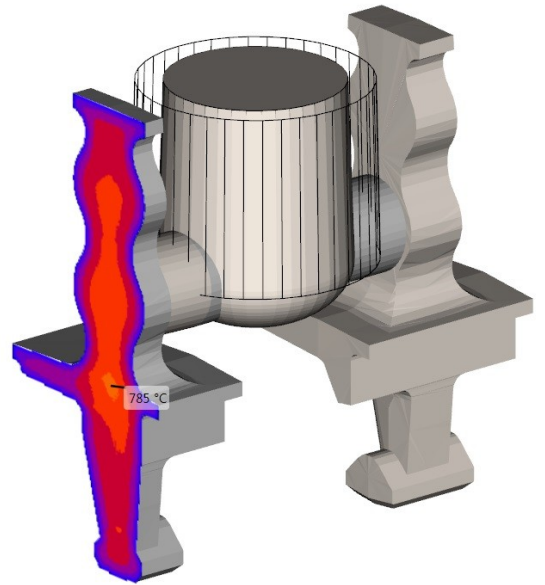
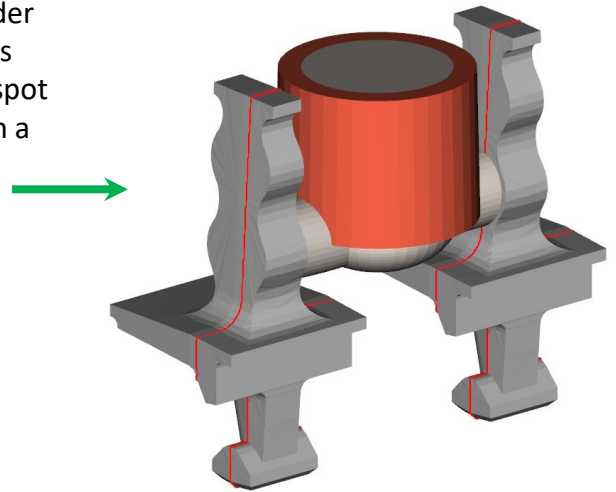
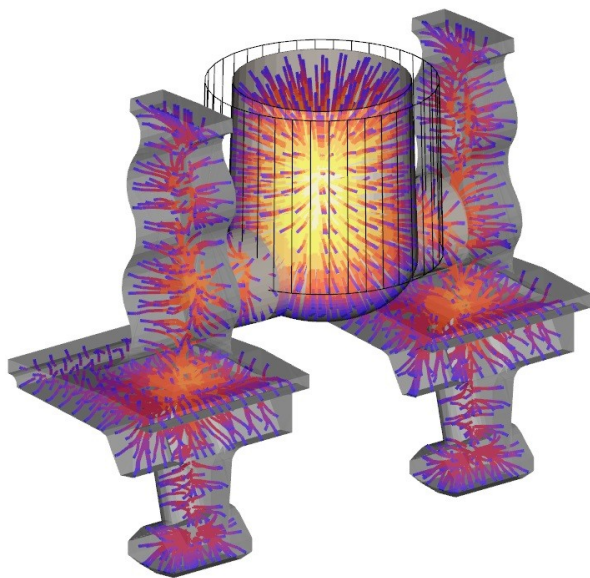
# Insert

# Ductile Iron, Disamatic Sand Casting

The methoding was modified by enlarging the feeder (65 mm diameter and 90 mm height). Its location is also changed and brought much closer to the hot spot region. Further, it was connected to two castings in a mold, to ensure better yield.



Simulation of 3D solidification and 2D sections through the casting in the defect-prone region shows significantly reduced hot spot.

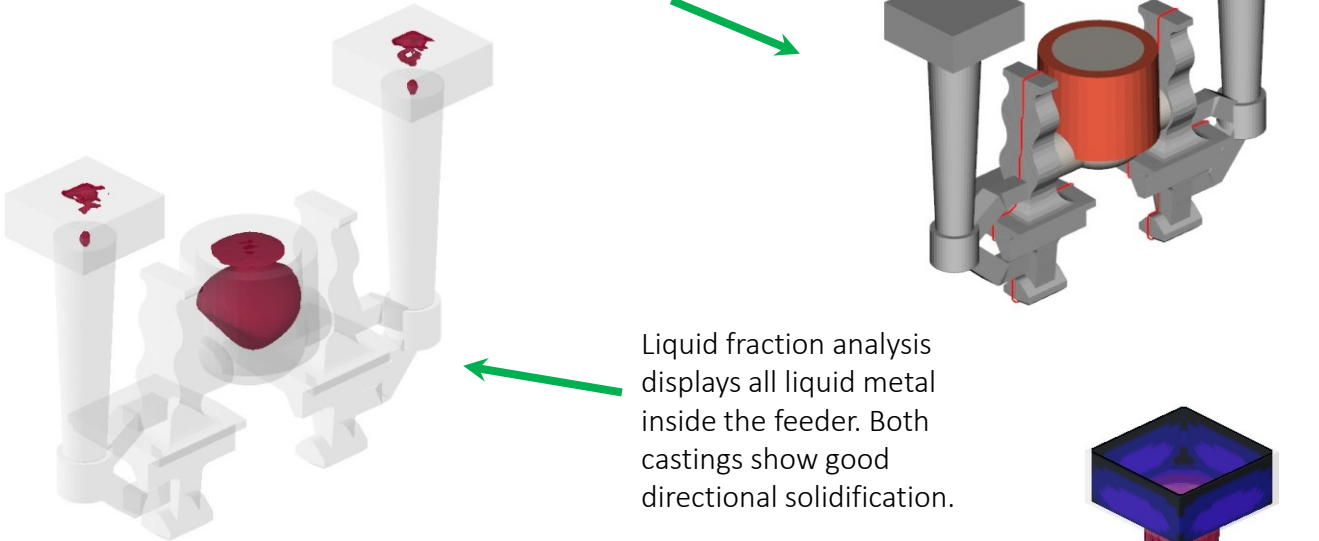


Feed metal path analysis also indicates good directional solidification between the part and feeder, indicating defect-free casting.

# Insert

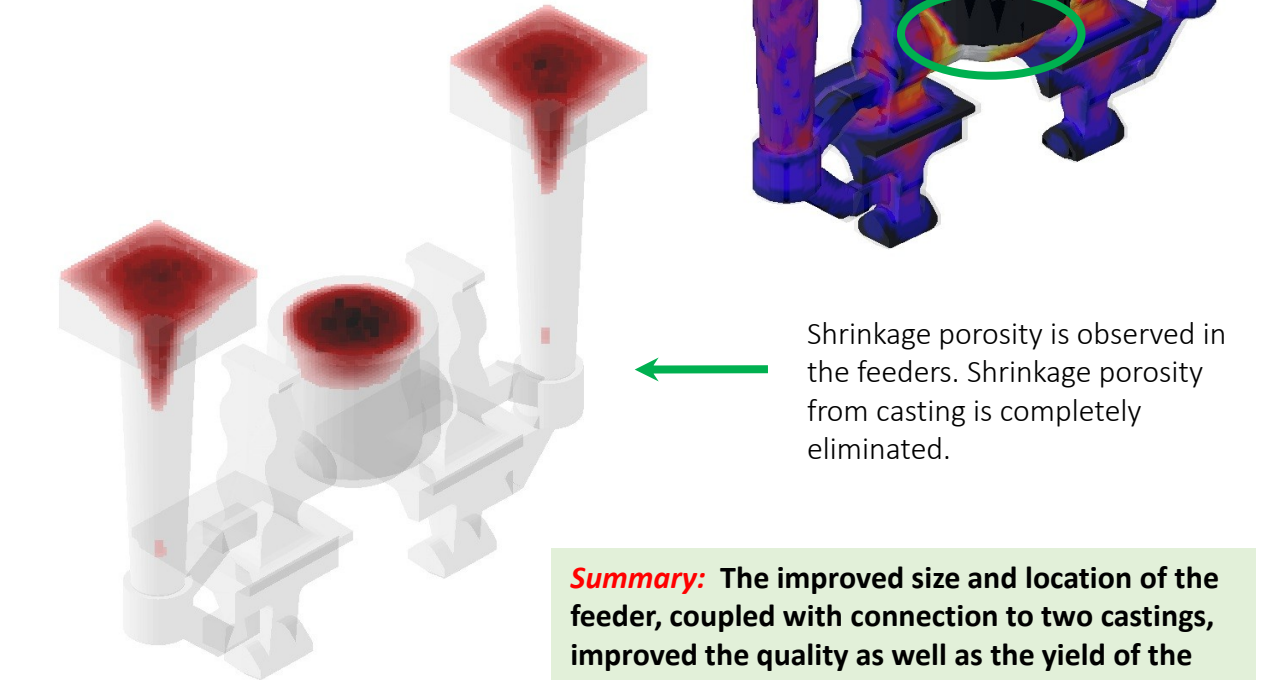
# Ductile Iron, Disamatic Sand Casting

Revised gating system includes two sprues, one each for both casting. Uniform filling is obtained for both the castings.



Liquid fraction analysis displays all liquid metal inside the feeder. Both castings show good directional solidification.

Last to solidify regions are in riser. This indicates that shrinkage porosity will be present only in feeder and no defect will appear in castings.



Shrinkage porosity is observed in the feeders. Shrinkage porosity from casting is completely eliminated.

**Summary:** The improved size and location of the feeder, coupled with connection to two castings, improved the quality as well as the yield of the casting.