

Mechanical defects:

- Recrystallisation
- Dimensional distortion

Problem definition

RX is caused by differential contraction rates of the alloy, shell and core, which impart large strains on the casting during solidification. The result is single or multiple equiaxed grains evident after heat treatment.

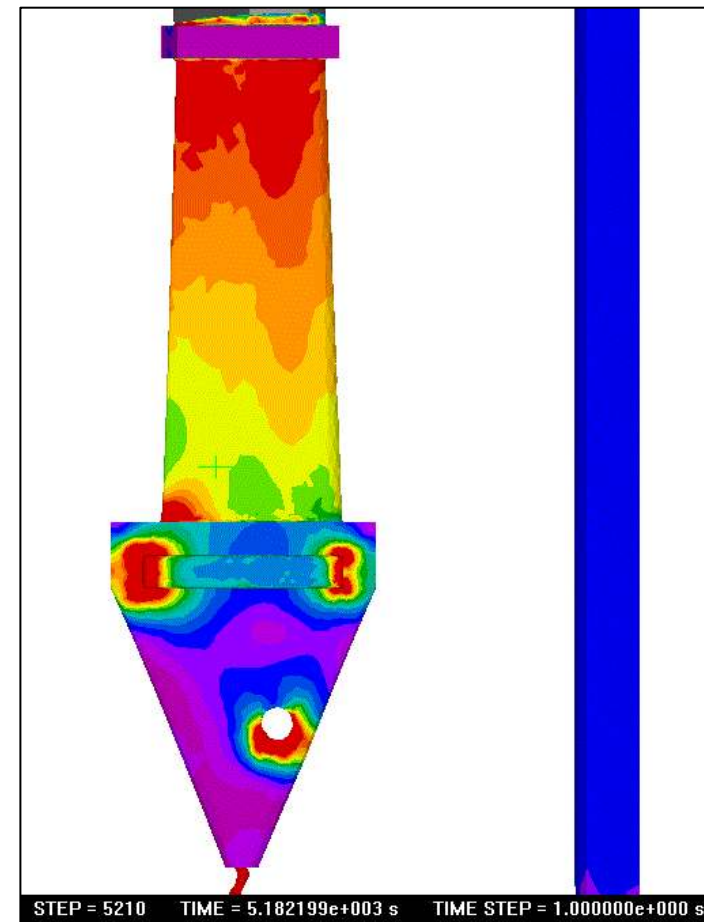
Process modelling

RX was predicted to occur in complex geometry, thin sections, regions of interface/restraint between casting, core and shell. This is consistent with actual blade castings.

Problem solution

There are numerous parameters that can be altered to reduce the resultant strain occurring, and hence eliminate or reduce recrystallisation.

Defect prediction



RX in the core prints & tip fillet radius

Problem definition

Dimensional distortions and core breakthrough are caused by resultant stresses that occur during casting. In some cases they can be rectified if machining stock is available, but in other cases they can cause scrap.

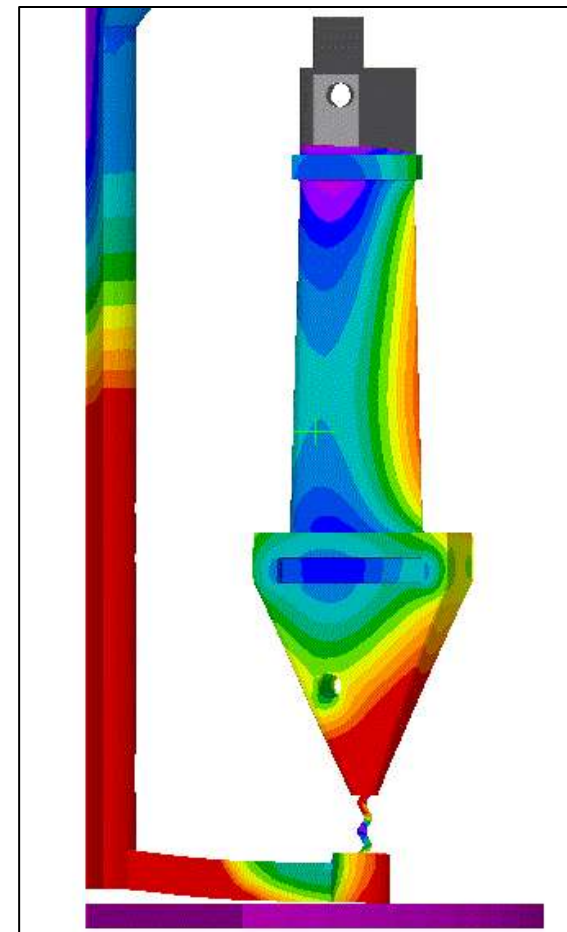
Process modelling

Distortions were predicted to occur in regions of complex geometry, thin wall sections, and regions of casting/core/shell where there is low restraint. This conflicts with the requirements for minimising RX.

Problem solution

Numerous parameters can be altered to reduce and even eliminate casting distortions and core breakthrough. Ultimately it is possible to design castings to account for distortions so that they contract to the desired nominal shape.

Defect prediction



Significant distortion of aerofoil trailing edge

www.sim-cast.co.uk

info@sim-cast.co.uk

+44(0) 1332 258840

© Sim-Cast Ltd 2008