

Problem definition

Ageing plays a major part in degradation of furnace performance & hence casting quality. There are two main types of degradation, thermal & mechanical, which cause furnace performance to get progressively & unpredictably worse with each casting cycle.

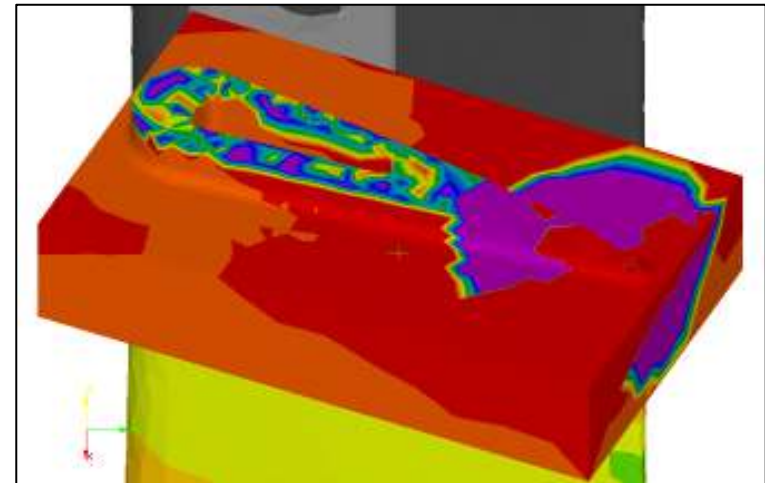
Sensitivity Analysis

Process models are a useful aid when designing the furnace core to not only understand the thermal performance, but to understand the relationship with differing parts and real world variations such as furnace thermal ageing. Here predictions of casting porosity are shown for new furnace versus an aged 'dirty' furnaces

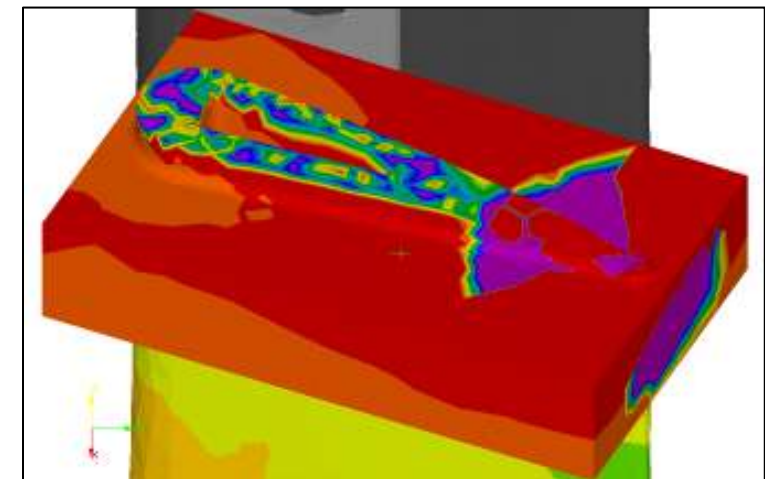
Problem solution

It is worth designing the part & process to account for process variations, by analysing the effects of furnace ageing on defects, such as shrinkage porosity, & reducing them to acceptable levels.

Defect prediction



Porosity - standard 'New' furnace



Porosity - aged 'Dirty' furnace