KISH GRAPHITE SPOTS, OPEN GRAIN

Cast iron.

Relatively large porous spots with ragged edges, usually on the cope surfaces of the casting, which appear in heavy section gray iron during machining. The pores are filled with powdery graphite. The material is generally low in hardness and usually leaks under pressure.

Possible Causes

— Carbon equivalent too high, especially the carbon, with regard to section thickness.
— Slow cooling, leading to the formation of very large Type A graphite lamellae.
— Large differences in section thickness (design defect).

Remedies

— Arrange for redesign if possible, with the objective of reducing the heaviest sections.
— Adjust the carbon equivalent, and most particularly the carbon content, to match the section thickness and cooling rates.
— Avoid excessively high coke ratios in the cupola.
— Use pig iron with fine, rather than coarse graphite flake size (low-carbon pig).
— Establish more uniform cooling rates in the mold by placing chills against heavy sections (denseners).
— Use a bottom-pour or teapot ladle, allowing the liquid metal to stand before pouring, and do not empty the ladle completely into the mold.
— Pour at the lowest temperature possible for running the casting properly.

Figure 264
Fragment of a gray iron cylinder showing spots of kish graphite: lower the carbon equivalent.