Hard spots which caused "comet tails" during polishing.

Possible Cause
Inclusions of corundum, spinel, silicon carbide or intermetallics rich in iron.

Remedies
— Use precautions in melting to avoid contamination.
— Allow sufficient holding time after melting to permit nonmetallic inclusions present to rise to the surface by decantation.
— Do not use cast iron crucibles coated with an improper wash.
— Do not use contaminated charge materials.

(See bibliography for G 111)
G 211

PRIMARY CHILL, CHILLED SPOTS OR EDGES, HARDNESS ANOMALIES

White iron structure, at least partially, especially in thin sections or at corners and edges, which changes progressively to a normal structure. The transition between the gray and white structure may be very gradual (normal primary chill) or may be discontinuous with white areas in the gray structure and gray areas in the white (mottled).

Cause
The carbon equivalent and/or the carbon/silicon ratio are not correct for the thickness, or cooling rate, of the casting involved.

Remedies
- Inoculate properly and adequately.
- Reduce the cooling rates (for example, eliminate fins which cause fast local freezing).
- Limit and control the content of carbide-forming elements (such as Cr).
- Avoid overheating or prolonged holding of the liquid metal (cause of mottling).

(Examples, following pages)

G 144 - Aluminum Alloy, Die Cast
Aluminum alloy die casting with a hard spot which appeared in relief during polishing.