BLACKING OR REFRACTORY COATING INCLUSIONS

Inclusions of flakes of material which are generally located below the surface on cope areas of the casting. At other locations on the casting there are slight surface projections of metal whose thickness corresponds to that inclusions.

Cause
Portions of the blacking or wash coating which have peeled away and become detached and then float to the cope surface as the metal fills the mold (Ed. note - see defect D 233, blacking scab).

Remedies
- Use a coating or wash whose thermal expansion is similar to that of the mold or core material.
- Do not apply graphite wash to hot molds or cores.
- Limit the thickness of the blacking.
- Reduce the clay content of the wash coating.
- (Ed. note: See defect D 233).

BLACK SPOTS

Ductile cast iron.

The fracture surface shows clearly defined black spots of irregular shape, whose greatest dimensions may range from a few millimeters to several centimeters; they are most prevalent for casting section thickness over 25 mm (1 in.) and are usually found in the upper (cope) sections of the casting.

When present, the mechanical properties of the casting are very low.

Possible Cause
Very high oxide and sulfide content in the molten metal.

Remedies
- Avoid use of pig iron which is very low in silicon.
- Restrict sulfur content of the bath, before magnesium treatment, to less than 0.01%.
- Strive for a minimum residual magnesium content.
- Limit the aluminum content of the iron.
- Use the highest practical pouring temperature.
- Addition of cryolite or other material which promotes the coagulation of slag particles.
- Use of a siphon ladle.
- Reduction of turbulence during transfer and pouring after magnesium treatment.

Figure 246
G 141 - Ductile Iron
Fractured ductile iron casting showing black spots.