DISPERSED SHRINKAGE

Narrow cavities resembling tears or fissures, generally perpendicular to the surface of the casting. Their depth may be as great as 2 cm (0.8 in.). The internal surface of the cavities is dendritic.
They are often accompanied by an enlargement in graphite flake size.

Possible Causes

- Carbon content too low.
- Nitrogen content too high (generally over 100 ppm). This factor becomes increasingly important as the casting section thickness increases. It is often the result of a high proportion of steel (especially basic Bessemer) in the charge or the use of an electric arc furnace for melting.
- Mold not sufficiently rigid.
Nitrogen release occurs during solidification, causing dispersion of the shrinkage.

Remedies

- Reduce nitrogen content.
- Reduce proportion of steel in the charge.
- Substitute alternate furnace (induction, cupola, etc.) for arc furnace for melting.
- Fix the nitrogen in the form of a nitride by use of titanium or aluminum.
- Dry the molds.

A 124 - Cast Iron, Dry Sand

Shell base of pearlitic gray iron (carbon about 2.5%) melted in an arc furnace; shows defect B 124, "dispersed shrinkage".
Nitrogen content of sample: 106 ppm.
Usual nitrogen content of such irons when cupola-melted: 40 to 80 ppm.

B 124 - Cast Iron, Green Sand

Machined surface of a gray cast iron showing dispersed shrinkage or "commas". Defect eliminated by addition of titanium-bearing pig iron to the charge.