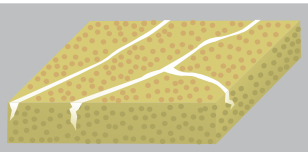
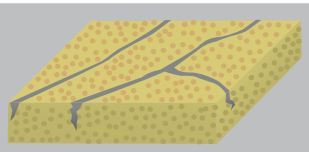
IMPROVING METAL CASTING QUALITY USING LOW THERMAL EXPANSION AGREGATES

Historically, silica sands have been used to produce molds and cores in the metal casting processes, however, most founders have had many difficulties in the Casting quality. Considerable research has been done to understand the defects in the castings related with silica sand thermal properties, one of the most frequently discussed is the veining or finning defect, it is caused due to the high thermal expansion of the silica sand during metal casting operations occasioning initially micro-fissures in the cores and molds and expanding in larger fissures or cracks and it is covered with molten metal.

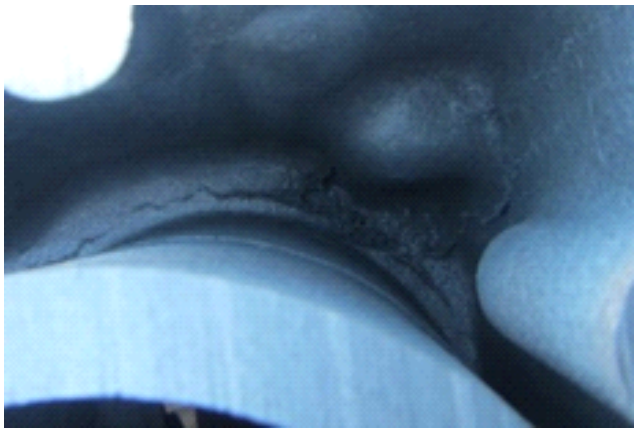


Crack forms in core



Crack fills with metal

Veining defects adds significant cost to the entire casting process, increasing cycles time in the finishing operations, reworks and in many cases, veining could be materialized as penetration defect causing scraps.



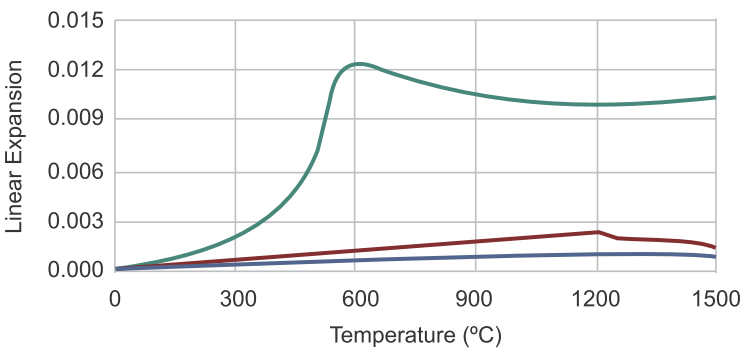
Accepted techniques have been used to prevent and control the veining defects, the most used are the addition or substitution of silica sand by special sands with lower thermal expansion, sand fluxing methods and burnout components. Considering multiple benefits related with thermal and physical stability properties, Special sands are the most indicated expansion control agent.

Over the past decades Mineração Curimbaba designed a **special corundum ceramic sand** with unique properties that allow exceptional benefits in the cores and mold process for metal casting industries reducing costs, improving quality, increasing production, improving health safety & environment sustainability, it is the **CASTBALL**, a great solution for veining defects.

Selecting a good designed ceramic sand assurance to the foundries to have a good control of specifications for the chemical analysis, particle size distribution and mainly the thermal properties.

In the recent years, complex and smaller dimensional tolerances in the casting parts have been required, it has motived an exhaustive research to improve the quality for additives and special sands to meet the needs for cores and molds, it will be the next topic to talk about.

LINEAR EXPANSION



Thermal Expansion @ 1100°C		
CastBall Premium	CastBall	Silica Sand
0.077%	0.253%	1.006%

Silica
CastBall
CastBall Premium

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