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## Open eye formation in a slab caster tundish: Cause and effects

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### Content

There are chances of ambient air getting aspirated into the upper nozzle/ladle shroud region that connects ladle to a tundish due to the presence of a negative pressure zone. Inert-gas shrouding is carried out in these regions with the idea to create a protective blanket all around the above-mentioned refractory structures. However, on the downside, some Argon gas bubbles get aspirated into the stream of liquid steel flowing from ladle into the tundish. An upwelling buoyant plume is formed which sweeps off the overlying slag layer and subsequently, gives rise to an exposed region of molten steel, known as the Tundish Open Eye (TOE). Mathematical modeling has been performed to show: (a) the effect of bubble plume on surface velocities of liquid steel and (b) the effect of thin and thick slag layers on TOE size. Finally, results obtained from analyses of inclusions obtained from TOE samples have been presented. The results show that TOEs can be a major source of reoxidation of liquid steel in tundish.

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