Introduction

Conventional thinking on tundish lining products has traditionally been to increase the overall magnesia (MgO) content to improve steel quality and extend casting sequence length.

However, this generally increases the spray lining product cost and can result in a lining system which is less tolerant to variable operational practices, storage and transit conditions.
Monocon has developed an alternative and innovative approach by combining MgO and CaO to achieve, what we believe, will be step change in tundish lining systems to achieve a more thermally efficient and chemically superior product, namely; Monolite/Monovibe – DM.

The aim of DM (being higher in its overall basicity) is to achieve performance comparable to 85% MgO products, though only having an actual MgO content of 65% and thereby maintaining an overall cost effective solution.
Using dolomite as refractory raw material for tundish lining

Dolomite is widely used and highly regarded as refractory raw material due to its high content of MgO and CaO. Its high basicity is especially suitable for basic oxygen steel making processes but offers benefits across the whole steelmaking spectrum.
Improving thermal insulation

The decomposition of Dolomite, when heated, liberates CO$_2$. This creates micro porosity within the lining which improves thermal insulation and reduces temperature loss from the tundish WITHOUT compromising lining strength.

- Longer Sequencing
- Lower Ladle Super Heat
- Improved Castability
Superior slag resistance

Highly basic slags promote the removal of phosphorous and sulphur and yet are aggressive to the tundish slag zone. Slag line attack on tundish lining is reduced as the lining CaO levels move closer to equilibrium with slags.

• Longer Sequencing
• Reduced Permanent Lining Wear
• Easier Skull Removal
Inhibiting phosphorous reversion into steel

Since the dolomite containing lining is of high basicity its interaction with any slag drawn from ladle to tundish will not release phosphorous back into molten steel.

- Fewer mis-casts due to phosphorus specification
Reducing the danger of hydration and caking

When lime or magnesia containing refractory material is applied, as an aqueous mixture (Monolite spray mass), to tundishes and steel ladles, cracks may be generated and material flaking or spalling may occur due to hydration (i.e. slaking) during curing, drying or preheating.

- Using dolomite will eliminate this hydration possibility.
Reducing inclusions and making cleaner steel

CaO in the refractory selectively adsorbs, or "catches", alumina and other non-metallic impurities which are contained in molten steel.

• This ‘reactive’ capability of the refractory to remove alumina and other impurities presents huge benefits for the quality conscious steel maker.
Improving continuous casting conditions

A reduction in the presence of non-metallic inclusions (NMI’s) significantly reduces the occurrence of deposition and clogging in tundish nozzles and casting shrouds.

- Longer Sequences
- Improved Castability
- Less incidence of NMI entrainment into mould
Monovibe/Monolite DM

Is a newly developed tundish dry mass or spray lining that contains a large component of natural dolomite alongside some special additives that stabilise the associated dimensional changes linked with a large LOI when reaching steel making temperatures.

- Dolomite; Monolite DM after two hours at 1000°C
- Dolomite; Monolite DM after two hours at 1525°C
Thank you

For more information contact

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