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Welcome to DCI's POWERMELT. We hope this quarterly newsletter will provide helpful information about silicon carbide, its applications, and our company.

Inside this issue:

Watch for the following features in upcoming issues:

SiC in Steel

SiC Injection

SiC Pricing

Profiles

POWERMELT

POWERMELT in Coreless Furnace Melting

Although silicon carbide (SiC) has been used in coreless furnaces since the 1960s, it can be beneficial to examine the mechanics of why one uses SiC in the first place.

There are a variety of very good reasons to use SiC in coreless melting, and in this article we will address the four most compelling. The most common reason for using SiC is to improve lining life. The second reason is the effect on base chill. Third, many melters opt for SiC over other sources of Si to reduce slag volume. Lastly, many melters use SiC in order to reduce slag-related defects.

DCI's ***POWERMELT*** 90% SiC has become synonymous with high quality and value added. In fact, over the last decade**, *POWERMELT*** has earned the reputation as being one of the highest quality metallurgical SiC additives available on the global market. The following will highlight how ***POWERMELT*** is generally used to enhance melting practices as mentioned in the second paragraph.

Improved Lining Life: The FeO in the slag reacts with silica (SiO2) to form a fayalite phase with a melting point of about 2150 degrees F. As a result, the lining surface will erode at almost any iron melting temperature. In addition to FeO, MnO forms a similar compound with SiO2 that melts at approximately 2284 degrees F. When SiC disassociates in the bath, both the FeO and MnO are greatly reduced as the slag and metal are deoxidized according to the following reaction:

$$SiC + 2FeO = Si + 2Fe + CO2$$

The FeO and MnO are generally the most destructive compounds in the bath. Reducing the FeO and MnO with ***POWERMELT*** can often double lining life. Keep in mind, the level of improvement depends on the amount of iron oxide that is introduced to the furnace. While rusty scrap or too much preheating will add to the FeO problem, clean charge materials will enhance lining life. Then again, as scrap quality varies SiC acts as a safeguard removing more

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Global SiC Issues Pressure US Importers & Consumers

By now practically everyone in the world buying silicon carbide (SiC) is aware of recent price trends. Since the beginning of 2007, global pricing on virtually all grades of SiC has been increasing with each passing month. There are a number of reasons for this development that are not related to traditional supply and demand factors.

First and foremost all across the globe the cost of kilowatt hours has increased substantially during 2006 and 2007. In fact, at several of the world's largest SiC furnace plants located in The Netherlands and Brazil, kilowatt hours have been increased to the point that the plants are operating on primarily off-peak power thus reducing total SiC output by as much as 30%.

While large SiC furnace plants traditionally dedicating to supplying Europe have curtailed production, 52% antidumping duties on Chinese SiC in the EU have created higher

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- SiC briquettes for cupola melting
- SiC grain for electric melting
- SiC experts for customer support
- ISO 9001 : 2000 Registered
- Central U.S. location provides 1-2 day truck deliveries
- Rail service available

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POWERMELT

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FeO when needed.

Chill: Without SiC, the base chill wedge will vary as FeO and MnO levels fluctuate. Use of ***POWERMELT*** reduces the FeO and MnO levels and the base chill is lowered and is more stable. Naturally, a more consistent base chill is fundamental to fluidity, shrink, and machineability.

Reduced Slag Volume: The third primary benefit is the reduction of slag volume. With stringent environmental laws forcing industry to minimize waste, ***POWERMELT*** plays a key role by reducing the amount of slag destined for the dump site. Most of the oxygen removed by SiC is in the form of CO2 at iron melting temperatures that bubble off as a gas rather than adding to the slag as a stable oxide. Although at first this advantage might seem rather nebulous, over time the benefits can be huge.

Slag-Related Defects: Slag fluidity increases as FeO and MnO levels escalate. When ***POWERMELT*** is added, FeO and MnO are reduced. This creates a thicker, drier, and easier to coagulate slag that can be more easily removed from the furnace. A thin runny slag is much more likely to carry over in the system even if there are multiple transfer points. Obviously, a few percent reduction in casting scrap is a significant cost advantage to a foundry. Using ***POWERMELT*** in the furnace can lead directly to a huge reduction in slag-related scrap with the most significant improvements coming in ductile iron shops.

The aforementioned benefits can often be overlooked or taken for granted in a coreless induction melting foundry. As a result, a few paragraphs reminding melters why they use ***POWERMELT*** is beneficial to everyone. No doubt, the use of ***POWERMELT*** SiC over any other source of silicon is a huge benefit when used in the melting of iron.

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prices in Europe. This creates supply displacement because Latin American SiC that would have normally been shipped to Mexico or the US is now being sold in Europe where those producers can maximize their sales dollars. Speaking of dollars, the low value of the dollar discourages other plants in countries such as South Africa and Romania from dedicating SiC to the US.

However, China remains the largest reason for the increase in global SiC prices. The Chinese SiC industry has seen kilowatt hour prices increase by as much as 25% over the past year. In addition, the strength of the Yuan has discouraged traders from simply seeking US hard currency — a practice Chinese traders have encouraged for at least two decades. Complicating those two factors is an already-booming Chinese metals business — one that has SiC demands of its own — that has caused the Chinese government to reduce the tonnage dedicated to license agreements and you have the "perfect storm". To exacerbate an already tenuous situation, the Chinese government is contemplating placing an export tax on SiC similar to Ferroalloys. In other words, it seems the Chinese now want to extract the full energy value of any material dedicated to export. This is an entirely new approach to energy for the Chinese and is a strong indication of what importers can expect in the future.

There are obviously other global issues at hand that have contributed to the recent spike in prices, however what is most important is for Dauber Company's loyal customers to know that DCI continues to do everything possible to mitigate the price increases. As what is arguably North America's lowest-cost processor of SiC, DCI keeps overhead at a minimum and efficiency at a maximum.

Prices are expected to continue increasing over the coming months and should peak during December 2007 or January 2008. Although global variables could throw this timing out of kilter, DCI will continue to carry one of the world's largest inventories of metallurgical SiC thus ensuring customers have material. This was the case during the last global SiC shortage in 2004 and 2005. While DCI's competitors struggled to service foundry customers, DCI was there to pick up the slack and never missed a single shipment.

If you have any questions regarding SiC global supply and demand, please contact your DCI representative for more information. DCI prides itself in providing the metals industry with the most consistent quality product; the most efficient delivery; best possible packaging; and up to date global SiC supply and demand intelligence.