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Ferro Silicon Zirconium

More Details About The Product

About

Zirconium is one of the most reactive elements that forms stable compounds with oxygen, nitrogen, sulphur and carbon. It is also used as a de-oxidant to modify non-metallic inclusions and also fixes uncombined nitrogen in boron steels particularly.

Ferro Silicon Zirconium	Zr	Si
	30-40%	50-60%

Standard Size



SPECIFICATION:-

- **Zr : 15% min. Si : 38% min**

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Ferro Silicon Zirconium)

	Std. Size (mm)
Lumps	10-60 & 10-80
Granules	2_5
Powder	1_2, 0.30-150, 0.10-1.18 & Below 1

Properties

Ferro Silicon Zirconium is the alloy of Iron Silicon and Zirconium produced by direct reduction of zircon sands

in electric arc furnaces at high temperature. This alloy is used as Zirconium additive in steel melt, which reacts with Oxygen, Nitrogen and Sulphur. Zirconium has been used in steel making additive for over more than 40 years. But this alloy (FeSiZr) is still today the least cost source of Zr available as steel additive. The specification of FeSiZr supplied by Minex is given below.



Production

When added in molten steel bath, it dissolved fast and Zirconium combines chemically with Oxygen, Nitrogen and Sulphur in the order named. The quantity of Zirconium addition per ton of steel required to improve steel properties has not been found to depend on the sulphur content as it is with Rare Earth metal addition. Consequently, it is more economical to use Zirconium and Rare Earth in steels with sulphur contents of 0.02% or more. Thus the amounts Zirconium to be added, depends more on the Nitrogen and Oxygen content than on Sulphur content. To be effective, the addition of Zirconium has to be sufficient to leave more free Zr after the precipitation of practically all the Nitrogen content as Zirconium Nitride and Zirconium Carbonitride. The addition of Zirconium can be made in Aluminium Killed steel as

Manufacturing Process of steel	% Nitrogen content	Minimum requirement of Zirconium	
		%Zr	Addition of Zirconium Kg/ton
BOF and OH steels	0.003 - 0.006	0.06	0.8 - 1.0
Electrical Furnace Steel	0.005 - 0.009	0.08	1.14 - 1.5

The above table suggests that for basic oxygen steels with sulphur in the range 0.02 – 0.03, 0.8 – 1 kg of Zirconium per ton of steel is sufficient where as in electric furnace 1.2 – 1.5 kg. Usually Ferro Silicon Zirconium is added to steel in ladle, it can be also added in mould. The recovery of Zirconium depends on various factors as grade of steel, Oxygen concentration, Nitrogen & Sulphur content, time of addition etc. The recovery of Zr is found 35% to 60%. For optimum result of Zr recovery, it is recommended to add the zirconium after the Aluminum and Calcium treatment.

Uses

FeSiZr is used to scavenge impurities (Oxygen, Nitrogen, Sulphur) or modify inclusion through the formation of complex sulphides and oxysulphides. ZrS is significantly more stable than MnS in steel. Therefore, if enough free zirconium is available during the early stages of solidification of a steel ingot, ZrS will form and prevent the formation of MnS. ZrS is much more refractory than MnS and practically non – deformable during hot rolling while, in aluminum killed steels, MnS produces long flat stringer inclusions in hot rolled plate and strip. The efficacy of Zirconium additions will therefore be measured not by the amount of residual "acid soluble" metal which remains, but by the extent to which inclusions are beneficially modified. It also raises the yield/tensile ratio and improves weldability through the reduction of under bead cracking and the elimination of porosity. In high alloys steels, Zirconium increases hardness but decreases ductility. In stainless steels, Zirconium retards the formation of sigma phase

Ferro Silicon Zirconium Market

Global Ferro Silicon Zirconium market size will increase by Million US\$ by 2025.

Ferro Silicon Zirconium market size is in (value, capacity, production and consumption) in key regions like United States, Europe, Asia Pacific (China, Japan) and other regions.



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