

CORED WIRE Ferroalloys

affival[®]
An OPTA Group Company

Affival is globally renowned as the leader in cored wire manufacturing. Our innovative products and state-of-the-art equipment designs demonstrate 20% improvements in recovery compared to standard cored wire setups. This performance advantage is especially useful for additions of expensive Ferroalloys.

Ferroalloys are beneficial to steelmaking because they have lower melting ranges than pure elements and are easily added to liquid steel. The two broad categories of ferroalloys are Class-I (with melting points below the temperature of liquid steel) and Class-II (melting points higher than the liquid steel temperature).

The ease in which a powder is added to liquid steel is known as the alloy's dissolution kinetics. The dissolution kinetics of ferroalloys depend strongly on their melting temperature ranges, particle sizes, and the convections within the liquid bath.

Compared to bulk additions, Affival cored wire allows for faster ferroalloy dissolutions, increased yields, improved consistency, more precise additions, and reduced material consumption.

Type of product:
Ferro-Alloys
including all grades of:
**Mn, Si, Cr, Ti, B,
Nb, V, Mo, etc.**
Some products also
available with N2 options

Metallurgy:
**Alloy additions,
nitriding,
trimming**

Ti

Affival ferroalloy cored wires allow for precise and energy-efficient trimming additions to meet each customer's chemical specifications.

Class-I ferroalloys:

Ferromanganese, Ferrosilicon, Ferrosilicon RE, Ferrochrome.

V

Class-II ferroalloys:

Ferroboron, Ferrotitanium, Ferroniobium, Ferrovandium.

Nb

Titanium (Ti), vanadium (V), and niobium (Nb) are durable carbide and nitride formers which are added to steel for strengthening and grain refining. Moreover, Ti and Nb treatments also reduce sensitivity to intergranular corrosion in austenitic stainless steels.

Fe

Adding V and Nb ferroalloys is common during the early stages of refining because of their high melting temperatures and recovery benefits.

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Affival can manufacture coils either horizontally or vertically depending on the design of the facility. Coils are connected to allow for non-stop wire injection. Packaging options include coil size, pallet type, protective wrapping, and reels.

Some of common product examples include:

Product	FeTi	FeV	FeNb
Wire diameter* (mm)	9.4 mm, 13.6 mm, 16.8 mm, 21mm	9.4 mm, 13.6 mm, 16.8 mm, 21mm	9.4 mm, 13.6 mm, 16.8 mm, 21mm
Melting point (pure element)	1688°C 3070°F	1890°C 3434°F	2469°C 4476°F
Melting range (ferroalloy)	1070-1130°C 1958-2066°F	1660-1740°C 3020-3164°F	1535-1630°C 2795-2966°F
Effect on steel	Grain refining Strength Toughness	Grain refining Strength Wear resistance	Grain refining Strength Corrosion resistance

* Other wire diameters are available upon request.

** Variations and customizations to these common products are also available.



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