

How Magnesium 6-8 Alloy Improves the Nodularization Process in SG Iron Treatment!

Strong, flexible, and dependable materials are becoming more and more in demand in the foundry sector. SG Iron, sometimes referred to as Spheroidal Graphite Iron or Ductile Iron, is one substance that continuously satisfies these requirements. The technique that gives SG Iron its special qualities is equally as remarkable as its strength. The [Magnesium 6-8 Alloy](#), a crucial component for efficient nodularization, is at the center of this procedure.



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HOW MAGNESIUM 6-8 ALLOY IMPROVES THE NODULARIZATION PROCESS IN SG IRON TREATMENT!

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REGULAR NODULARIZATION	BETTER MICROSTRUCTURE	REDUCED CARBIDE FORMATION	STABLE METALLURGICAL PROCESS

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What is SG Iron?

Instead of the flake-like graphite present in grey cast iron, SG Iron is a type of cast iron that has spherical (nodular) graphite in its microstructure. Because of these spherical nodules, SG Iron is able to retain its strength and ductility, which makes it appropriate for uses where stress and impact resistance are necessary.

It is extensively utilized in: Automobile parts (suspension parts, crankshafts)

- **Pipe and valve fittings**
- **Agricultural equipment**
- **Heavy machinery**
- **Wind turbine parts**

But how does graphite take this spherical form? That's where the nodularization process comes into play.

The Purpose of Magnesium in Nodularization

Magnesium is responsible for modifying the structure of graphite during solidification. When added to molten iron, it suppresses flake formation and encourages the development of spherical nodules. This not only improves strength but also enhances elongation and fatigue resistance.

However, handling pure magnesium is highly reactive and hazardous. For this reason, foundries use controlled magnesium alloys—specifically those with 6-8% content—which act as [Nodularisers](#), allowing for safer, more efficient, and consistent processing during S G Iron Treatment.

What is Magnesium 6-8 Alloy?

These alloys typically contain:

- **6-8% Magnesium**
- **Silicon**
- **Iron (Fe) base**

This composition allows for a controlled and gradual reaction with molten iron, delivering consistent magnesium recovery rates and ensuring proper nodularization.

Key Benefits of Using Magnesium Alloy

1. Regular Nodularization

The optimal magnesium concentration for different grades of ductile iron is between 6 and 8%. It leaves enough magnesium behind to generate graphite nodules while supplying enough magnesium to react with sulfur and oxygen in the melt.

2. Better Microstructure

Graphite nodules that are uniformly shaped are encouraged to develop by magnesium alloy. Increased tensile strength results from this.

- **Better elongation properties**

- **Enhanced fatigue resistance**

3. Reduced Carbide Formation

Carbides may occur in the matrix as a result of too much or unequal magnesium. When utilized properly, magnesium reduces this risk and guarantees a ductile, clean construction.

4. Stable Metallurgical Process

The use of alloyed magnesium helps maintain consistency across melts. This stability is essential for large-scale production, where quality control is critical.

5. Safe Handling and Application

Magnesium alloy is available in various forms such as ingots, cored wire, and crushed granules. Each form is designed for specific treatment practices, offering better control and safety compared to pure magnesium.

6. Cost Efficiency

Due to its high reactivity, pure magnesium results in more wastage. The alloyed form, on the other hand, ensures higher magnesium recovery, better usage efficiency, and less material loss—resulting in overall cost savings.

Application Methods in Foundries

There are various methods of introducing Mg 6-8 into molten iron:

- 1. Tundish Cover Method:** Placing the alloy in a covered ladle and pouring molten metal over it. Simple but can result in some magnesium loss.
- 2. Cored Wire Injection Method:** Using a wire feeder, magnesium is injected into the molten metal as wires. This enables little reaction loss and accurate control.
- 3. Converter or Sandwich Method:** Magnesium alloy is buried under a cover material at the bottom of the ladle to control the reaction rate.

Each foundry selects the method based on its production setup, melt size, and casting requirements.

Example: Real-World Impact

A mid-sized auto parts foundry reported the following improvements after switching to Magnesium alloy:

- **Reduction in reject rate by 25% due to fewer casting defects**
- **Increased magnesium recovery from 30% to over 45%**
- **Improved nodule count and nodularity in final castings**

These outcomes resulted in reduced production costs as well as improved customer satisfaction and product quality.

Conclusion

The success of [S G Iron Treatment](#) relies heavily on precise and controlled nodularization. Using magnesium alloys with a balanced composition ensures not only better mechanical performance but also consistency across production batches.

By enhancing graphite morphology and minimizing process-related risks, these alloys are instrumental in producing high-quality ductile iron castings for a wide range of industries.

#Magnesium6-8Alloy #SGIronTreatment #CoredWireInjection #Nodularisers