



## ALUMINUM STRONTIUM

Modification of the morphology of the silicon phase in aluminum silicon alloy castings from coarse platelets to a fine fibrous eutectic structure results in improved soundness and mechanical properties, particularly ductility. The use of strontium to “modify” the structure of aluminum silicon casting alloys is a very effective and widely accepted practice.

Strontium differs from other modifiers in that it retains its modification effectiveness for extended periods of melt holding time. The modification provided by strontium tends to survive repeated remelting so that strontium is commonly referred to as a “permanent” modifier. In master alloy form, strontium is the preferred choice in foundries for recovery, safety, storage, and handling.

Aluminum strontium master alloys provide convenient, stable, and effective sources of strontium for the aluminum foundry market as well as producers of aluminum foundry ingots.

Chemical Composition Limits % - Maximum unless shown as a range											
Alloy	Designation	Color Code	Sr	Si	Fe	Ca	P	Mg	Ba	Others Each	Total
<b>3.5% Strontium</b>	AA-H2012		3.2 - 3.8	0.20	0.30	0.03	0.01	...	...	0.03	0.10
	CEN-93800		3.2 - 3.8	0.30	0.30	0.03	0.01	...	...	0.04	0.10
<b>5% Strontium</b>	AA-H2018		4.5 - 5.5	0.20	0.30	0.05	...	...	0.05	0.04	0.10
	CEN-93802		4.5 - 5.5	0.30	0.30	0.05	0.01	0.05	0.05	0.04	0.10
<b>10% Strontium</b>	AA-H2007		9.0 - 11.0	0.20	0.30	0.03	0.01	0.05	0.10	0.05	0.15
	CEN-93804		9.0 - 11.0	0.30	0.30	0.10	0.01	0.10	0.10	0.04	0.10
<b>15% Strontium</b>	AA-H2019		14.0 - 16.0	0.20	0.30	0.05	0.01	...	0.10	0.05	0.15
<b>20% Strontium</b>	AA-H2020		18.0 - 22.0	0.20	0.30	...	...	...	0.10	0.05	0.15

### Benefits of aluminum strontium master alloys:

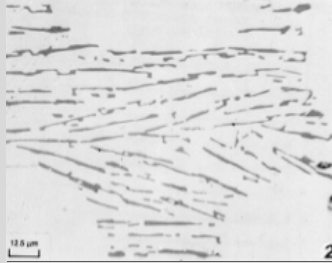
- Safe to handle and store
- Can be easily introduced into the melt with little or no turbulence
- Compatible with grain refiners
- Readily available in many forms – rod, cut rod, waffle, sheared cast bar, and buttons
- Exhibit consistent performance and effectiveness from heat to heat
- Users are able to obtain improved elemental yields and long residency in the furnace



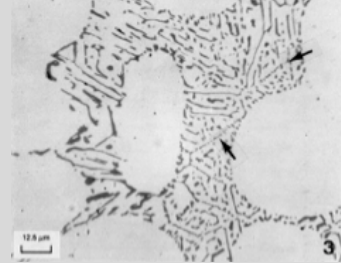
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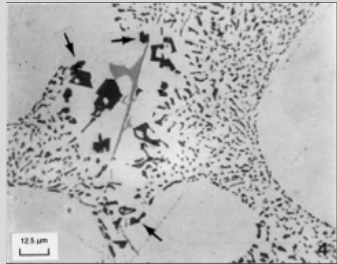
AFS Rating #1 – Non-modified.



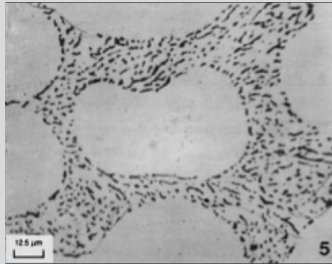
AFS Rating #2 – Lamellar structure with some acicular silicon but no large plates.



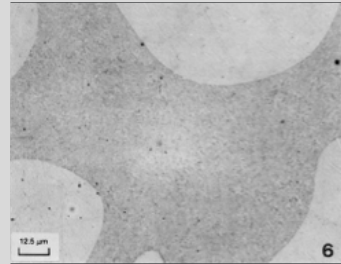
AFS Rating #3 – Partial modification showing lamellar structure breaking up.



AFS Rating #4 – Absence of lamellar structure with small amounts of acicular silicon.



AFS Rating #5 – Fibrous silicon eutectic structure with no acicular phase. Referred to as 'fully modified'.



AFS Rating #6 – Fibrous silicon where individual particles are not easily distinguishable under optical viewing.

Photos courtesy of AFS, Inc.