

CONNECT

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In the last issue of SNAM CONNECT, we had proudly introduced to you, the 2nd robot in our production process. Improving product quality is the mainstay of our work culture, and we continue to innovate and improvise on quality aspects. We have since introduced the 3rd robot into our production process as part of our initiative to increase quality and reliability, and to reduce waste by automating the process. We will continue to uplift our quality benchmark through various efforts like this.

EXPORT AWARD

We are happy to inform you that we have one more feather added to the SNAM cap. We have received the National Award for Export Excellence “Silver Trophy” award for Top Exporters for the 2014-15 in the “Small Enterprise” Category from Engineering Export Promotion Council on 13th December 16 in Delhi. The award was presented by the Honourable Minister of Railways, Shri Suresh Prabhu, Government of India.



SNAM R&D Team had participated in the IIF Chennai Chapter Cast Quiz during November 2016 and placed firstrunner-up, and then subsequently qualified, participated and came first runner-up in the IIF Southern Region Cast Quiz. SNAM is proud to congratulate Mr. Harisankar R and Mr. Vikas Agarwal, the members of the team that won both these accolades.

Technical Training for foundrymen at SNAM R&D

As you might know, SNAM has been providing technical training to new and practicing foundrymen in tackling the challenges of the 21st century in a foundry environment, for quite some time now. We have had 15 such training sessions till date, and have served over 171 foundry professionals from over 40 different foundries.

Contact us @ marketing@snam.co.in or info@snam.co.in for registration.

WIDMANSTÄTTEN GRAPHITE STRUCTURE

Introduction:

Widmanstätten graphite is a morphological structure having spiky appearance on the graphite flake structure, and is a result of contamination of Lead (Pb). The other elements which may cause this morphology are Antimony (Sb), Arsenic (As), Bismuth (Bi) and Tellurium (Te). Lead levels as low as 0.002 – 0.004% have been known to create the Widmanstätten graphite structure in castings.

Widmanstätten graphite occurs during solidification with the precipitation of Carbon atom on crystallographic planes creating a spiky appearance to the existing graphite flake. It is extremely thin and cannot be detected at magnification of 100X, magnification in the range of 400X or above is required.

The presence of this graphite form greatly reduces the mechanical properties of the resulting iron. A drastic decrement in Tensile strength can be observed in presence of Widmanstätten graphite.

REASONS FOR WIDMANSTÄTTEN STRUCTURE

Trace Element Effects

Existence of Lead and trace elements, interaction with humid environment, cooling rate, interaction with Calcium and Lead are parameters that accelerate Widmanstätten formation.

Effect of Interaction with Humid Environment

Detrimental effect of lead increase with humidity in the environment. Humidity is an active hydrogen sources and as a result of combination with Lead decreases surface tension and damages the morphological structure of graphite.

Cooling Rate Effects

Cooling rate is one of important parameters of Widmanstätten graphite formation. Lower cooling rates cause to formation of Widmanstätten graphite.

Effect of Calcium

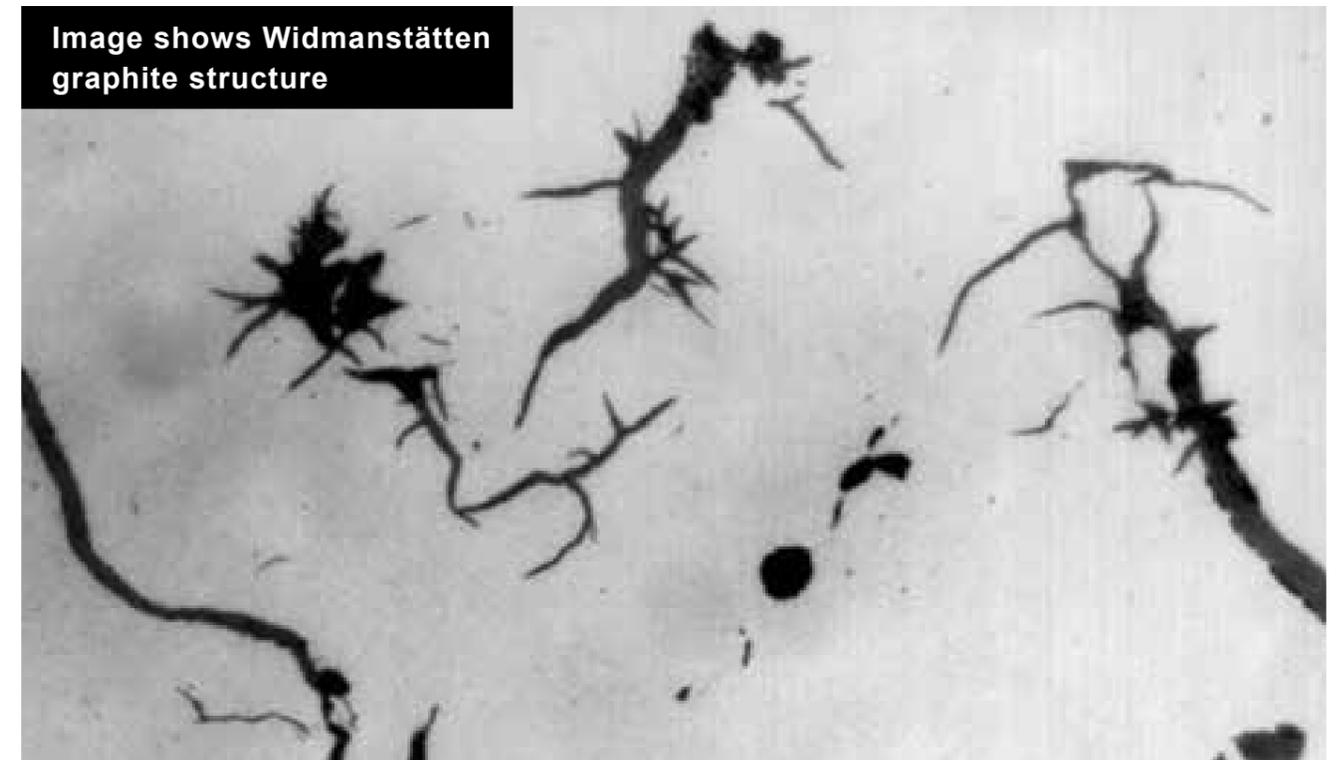
Combination of Calcium and Lead accelerates the formation of Widmanstätten graphite. Calcium atoms are bonded with Carbon atoms and covers the flake graphite surface with CaC_2 at liquid and solid interface. But CaC_2 cannot cover the surface completely. Ca_2Pb plate causes to diffusion of carbon atoms to austenite phase. At this condition, the growth of last graphite is not possible and Carbon atoms which enters to austenite phase are precipitated as orientated crystals of Widmanstätten graphite.

Possible solution for Widmanstätten Structure

The most efficient method to control Widmanstätten graphite structure is the control on presence of tramp elements. This can be achieved by having a control on the charge materials.

Alternately, research has shown that this graphite type can be controlled with the addition of rare earth elements, primarily Cerium. As a consequence, this condition does not often occur in ductile iron because of the presence of rare earth elements coming from the treatment alloys. In case of grey cast iron, a cerium based inoculant may help eliminate presence of Widmanstätten graphite structure.

Image shows Widmanstätten graphite structure



Feeder Equipment for Foundry

For a foundry, producing good quality casting is very important. To achieve this, accurate amount of raw material addition must be ensured during every production and treatment cycle of the molten material. Reliable addition of raw material can be achieved by using feeder equipment. The advantages of using a feeder equipment are given below:

1. Increased accuracy of addition.
2. Effective usage of inoculants and nodulants.
3. Avoid human fatigue.
4. Fool proof addition system.
5. Better monitoring and control of the process.

SNAM helps address the above purposes with the following equipment offerings:

1. SMARTFEED (i).
2. SMARTFEED (I).
3. MAGFEED.

SMARTFEED (i):

SMART FEED (i) is an instream inoculant dispensing equipment. It can be used for the dispensing of fine inoculants with size under 0.7 mm.

SMARTFEED (i) comes with the following features:

- Gravimetric feeding with load cell for accurate weight achievement.
- It is a compact equipment, occupying 400 mm x 400 mm floor space.
- Feed rate ranging from 2 g/s to 20 g/s (wide range of feed rate)
- Machine has a 50 kg, easily detachable storage hopper, with material level sensing.
- Auto identification of clogging in the chute, and alarm option with controlled pneumatic system for the transport of inoculant through long chutes.
- Online/Local Data storage (Date, Time, Heat No and Inoculant quantity added)



SMARTFEED (I):

SMARTFEED (I) is a semi-automatic Inoculant dispensing machine for ladle inoculation and furnace inoculation process for dispensing coarse inoculants (0.5-3 mm and 2 – 6 mm).

SMARTFEED (I) comes with the following features:

- Robust construction to withstand the environmental condition near furnace and ladle.
- Online/Local Data storage (Date, Time, Heat No and Inoculant quantity added) and retrievable facility.
- Feed capacity ranging from 100 g to 3 kg with accuracy of 2%.
- Machine will be provided with 50 kg storage hopper, integrated with material level sensing.



MAGFEED:

MAGFEED is a semi-automatic alloy dispensing machine for FeSiMg treatment during ductile iron production.

- Robust construction to withstand the environmental condition near furnace and ladle.
- Online/Local Data storage (Date, Time, Heat No and Inoculant quantity added) and retrievable facility.
- Compatible with inoculants of size 2mm to 6mm, FeSiMg 2mm to 30 mm, MS Scrap (buttons) 10 mm to 50 mm, for various size distributions.
- Customizable dispensing system with different capacities of storage hoppers like 100 kgs, 250 kg, 500 kg and 1000 kg of Inoculants, FeSiMg and MS scrap, respectively.
- Feed capacity ranging from 500 g to 18 kg with accuracy of 1%.
- Predetermined selection of different grades and variable sequence of feeding.



Did You Know?

DID YOU KNOW?
KNOW?

Aluminium is the most common metal in the earth's crust, almost twice as abundant as iron. And one common class of aluminium minerals, collectively called alum, has been in use since at least Greek and Roman times. But there was no easy way to extract aluminium (unlike iron) from ores, no matter how much you heat them. No one succeeded in isolating aluminium until a German chemist (Friedrich Wohler) extracted a few flakes in the 1820s.

Aluminium was considered as a more precious metal than gold and silver in the 19th century, because it was harder to obtain. The French government once displayed Fort Knox-like aluminium bars next to the crown jewels, and the emperor Napoleon III reserved a prized set of aluminium cutlery for special guests at banquets. (Less favoured guests used gold knives and forks.) The United States, to show off its industrial prowess, even capped the Washington monument with a six-pound pyramid of aluminium in 1884.

But soon entrepreneurs in the United States and Europe finally figured out how to separate aluminium from minerals cheaply and also how to produce it on an industrial scale. They did so by running a current through a bath of liquid with dissolved aluminium ore in it. The electricity shocked the dissolved aluminium molecules, knocking them out of solution, at which point small grey nuggets collected in the large tub.

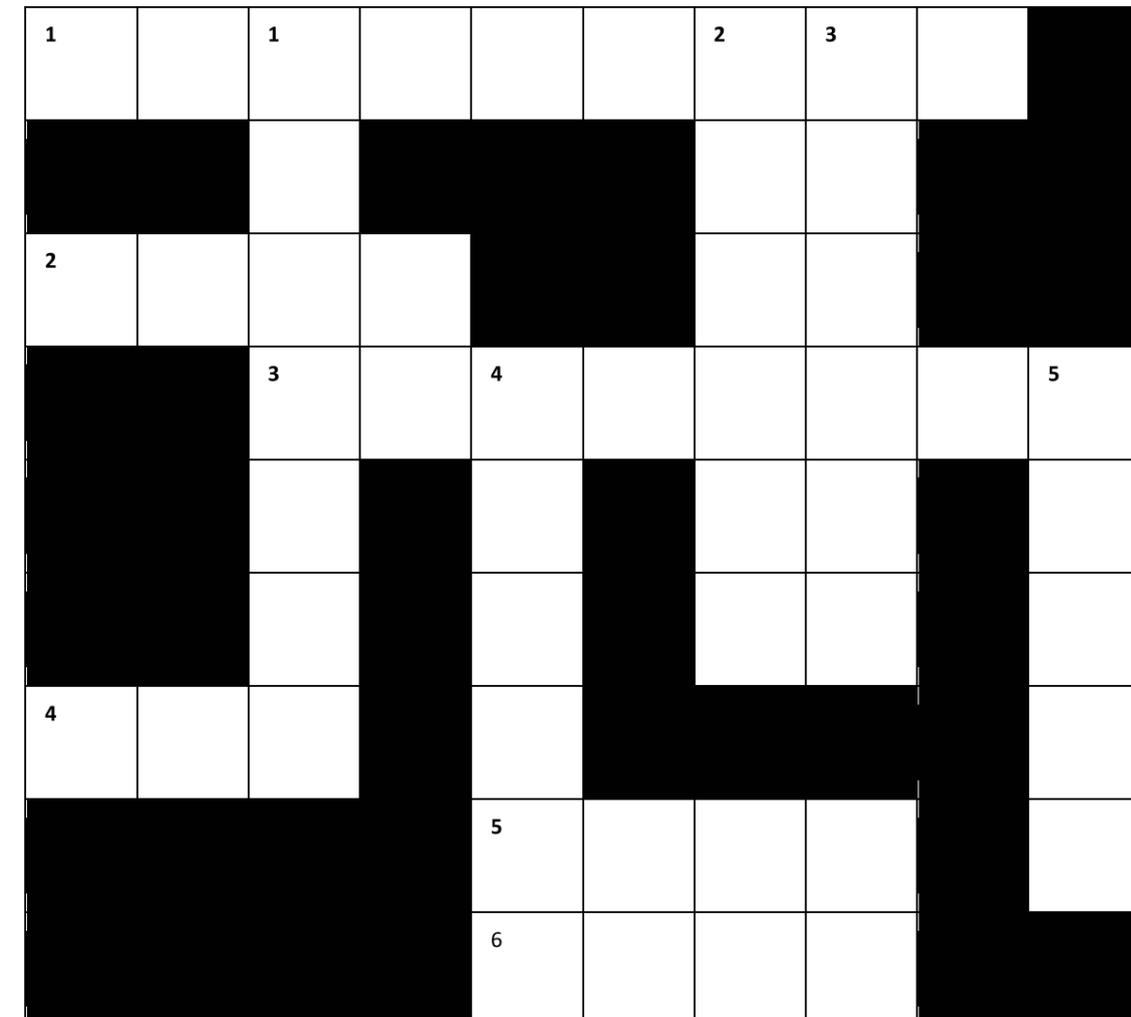
Crossword

Across:

1. The FCC phase of iron and steel, also refers as gamma iron.(9)
2. Bottom section of a mould. (4)
3. The temperature at which solidification of metal begins on cooling and the temperature at which the last portion of solid metal becomes liquid on heating. (8)
4. ____ Iron is a product of blast furnace and use a part of charge mix for cast iron foundries.
5. A type of defect also known as hot crack (4)
6. An alloy of copper and _____, which is commonly known as brass. (4)

Down:

1. Surface oxidation, partially adherent layers of corrosion products, left on metals by heating or casting in air or in other oxidizing atmospheres. (7)
2. Non expanding clay crystalline mineral. A secondary mineral precipitate phyllosilicate or layered alumino-silicate. (6)
3. A modern rolling mill where rolling is done in one pass. (6)
4. A form of silica occurring in hexagonal crystals which are commonly colourless and transparent. (6)
5. A casting defect resulting from the mismatch of cope and drag. (5)



Snam's Global Network

**CASTING
HIGHER STANDARDS
ACROSS THE GLOBE**

**WE REACH OUT
TO FOUNDRIES IN
MORE THAN 46 COUNTRIES...**

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Casting Higher Standards



SNAM
Casting Higher Standards

Snam Alloys Private Limited

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Kariamanickam Village
Nettapakkam Commune
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Unit 2

Damalacheruvu Village
Pakala - 517 112
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