Elkem

Foundry Products Division

BARINOC® Inoculant

QS-9000 ISO 9001 ISO 14001

www.foundry.elkem.com

BARINOC® INOCULANT

- Fade resistant inoculant
- Used in grey and ductile iron
- Very effective in low S grey iron
- Positive effect on slag formation in ductile iron
- Effective inoculant for alloyed irons such as Ni-resist
- Especially effective as a preconditioner or as first step inoculation
- High Si inoculants are more effective than low Si inoculants

Barinoc inoculant is a 75% Si based alloy with defined levels of barium and calcium. The inoculant has a silver grey crystalline appearance and it is especially developed for inoculation of medium to heavy section castings due to its good fade resistance. The combination of barium and calcium will give such castings the optimum inoculation effect.

Barinoc inoculant is produced to the following specification:

Silicon	72-78%
Barium	2-3%
Calcium	1-2%
Aluminium	Max 1.5%
Iron	Balance

Production.

Barinoc inoculant is produced at the Elkem Bremanger plant in Norway using special techniques to ensure maximum uniformity of composition and structure throughout the product. The Elkem Bremanger plant has ISO 9001, ISO 14001 and QS9000 accreditation.

Ferrosilicon alloys that contain elements such as calcium, barium and aluminium have complex structures consisting of a number of intermetallic compounds. The solidification temperatures of these compounds vary and this can lead to extensive segregation of the lower melting point compounds if the alloy is allowed to cool slowly during casting. Because some of these compounds are more brittle and crush more readily, this can lead to wide variations in compositions of different particle sizes after crushing and grading.

At the Elkem Bremanger plant, the Barinoc inoculant is cast into thin slabs in iron moulds. This produces a very fine structure and avoids any risk of segregation occurring.The composition of Elkem Barinoc inoculant is therefore consistent over the range of particle sizes. The phase composition is shown in **Figure1.**

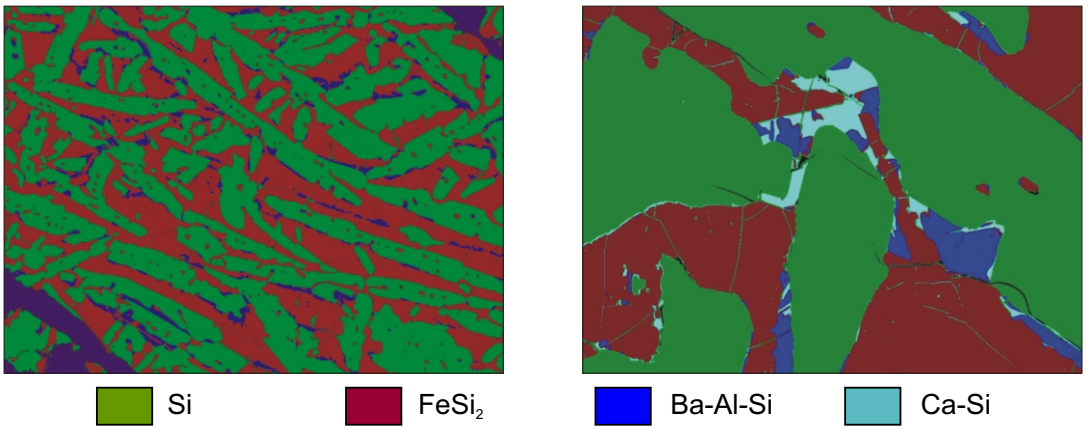


Figure 1: Typical phases in Barinoc inoculant.

Advantages of Barinoc Inoculant.

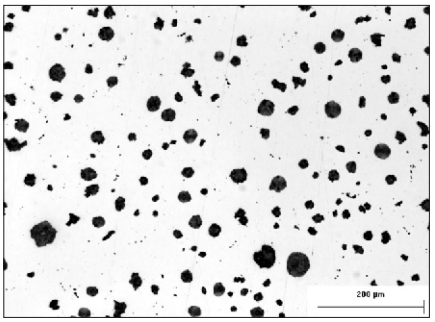
Barinoc inoculant is an excellent chill remover in both grey and ductile iron. Due to its fading resistance it will normally be used for medium to heavy section castings, although it is an excellent inoculant also for small castings. Barinoc inoculant will also be the first choice where long pouring times are unavoidable.

Barinoc inoculant has proven to be an effective inoculant for low sulphur grey iron where other inoculants have limited effect.
The use of Barinoc inoculant, added together with the nodulariser in the production of ductile iron, has been shown to change the phase composition of slags generated during the nodularising process. In this case, slag tends to remain in the ladle. Less slag will then be transferred from the treatment ladle to the autopour unit and further there is a reduced tendency to clogging of filters. Further information on this is given in Elkem Technical Information Sheet No.24.

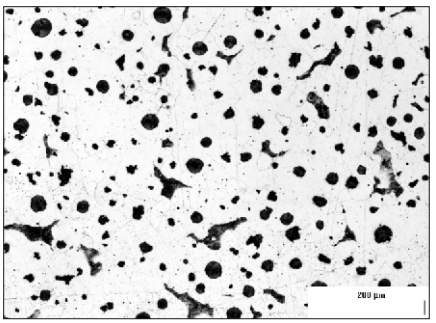
Barinoc inoculant is a very effective preconditioner in both grey and ductile iron. Also, as a first step inoculant in a two step inoculation process, Barinoc inoculant is the preferred inoculant and gives maximum effect in conjunction with a carefully selected second stage inoculant. Specialist advice on the best combinations of inoculants should be sought from your Elkem representative. Compared to Si/Ca based inoculants the addition of Barinoc inoculant can normally be reduced by 20 - 50 %.

Barinoc inoculant helps to reduce nodule count and size variations between thin and thick section castings.

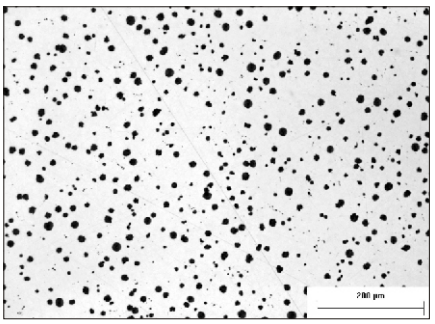
Figure 2. shows examples of thin and thick ductile iron sections when Barinoc inoculant has been used.



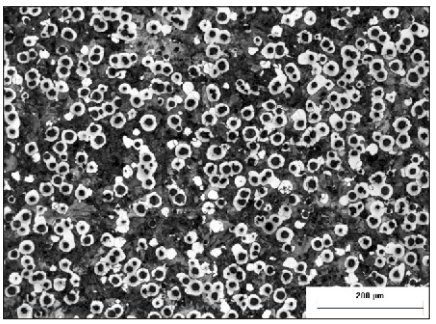
Thick Section 20 mm
Microstructure in polished condition.



Thick Section
Microstructure in etched condition.



Thin section 6 mm
Microstructure in polished condition.



Thin section 6 mm
Microstructure in etched condition.

Figure 2: Comparison of microstructure in thin and thick casting sections when Barinoc inoculant is used.

Addition.

Barinoc inoculant can be used both as ladle and stream inoculant. Addition in the ladle will, for grey iron, normally be 0.2 - 0.4 wt% and for ductile iron 0.3 - 0.5 wt%. When added to the stream the addition rate will be 0.05 - 0.15 wt% in grey iron and 0.1 - 0.25 wt% in ductile iron. Used as a first step inoculation or as a preconditioner, the addition will be from 0.1 - 0.5 wt% for both grey and ductile iron. When it is used as a slag conditioner the addition will be 0.05 - 0.1 wt% added together with the nodulariser.

Physical Data

Apparent Density:	3.1 g/cm^3
Bulk Density:	1.75 g/cm^3
Melting Range:	1325^{o}C(liquidus)
	1208^{o}C(solidus)

Standard Sizes

Stream Grade:	0.2 - 0.7 mm
Small Ladle:	0.7 - 2 mm
Larger Ladle:	2 - 6 mm

Standard Packing

Big Bag:	1050 kg on pallet
Big Bag:	1500 kg on pallet
Big Bag:	500 kg on pallet
Paper Bag:	25 kg on pallet
Steel Drum:	200 and 220 kg

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