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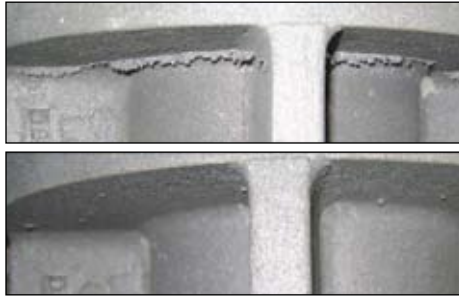
New Product Anti-Veining Solution Developed for Steel Casting

IGC Technologies Inc., Milwaukee, had been producing anti-veining solutions for gray and ductile iron for years, but recently, steel casters indicated a similar need for something that could eliminate thermal expansion defects in high temperature alloys.

IGC worked to develop an anti-veining product that worked as well as or better than the current industry standard at a lower cost. The result was Veinseal HM for Steel, a blend of raw materials formulated for the steel casting industry.

To validate the effectiveness of the product, IGC participated in a joint research project with the Univ. of Northern Iowa (UNI), Cedar Falls, Iowa. The performance of Veinseal HM for Steel was also evaluated at Badger Alloys, Milwaukee, a caster of steel, gray and ductile iron and copper-base alloys.

At UNI, samples of phenolic urethane nobake cores with anti-veining additives and specialty sands were tested using the step cone method, which evaluated the core material's resistance to penetration and susceptibility to veining. Additional testing included a tensile strength profile to gauge the degradation of the mechanical properties of the sand mixtures.



In a trial case study performed at Badger Alloys, using Veinseal HM for Steel (bottom) yielded 70% reduction in time spent removing the veins from castings.

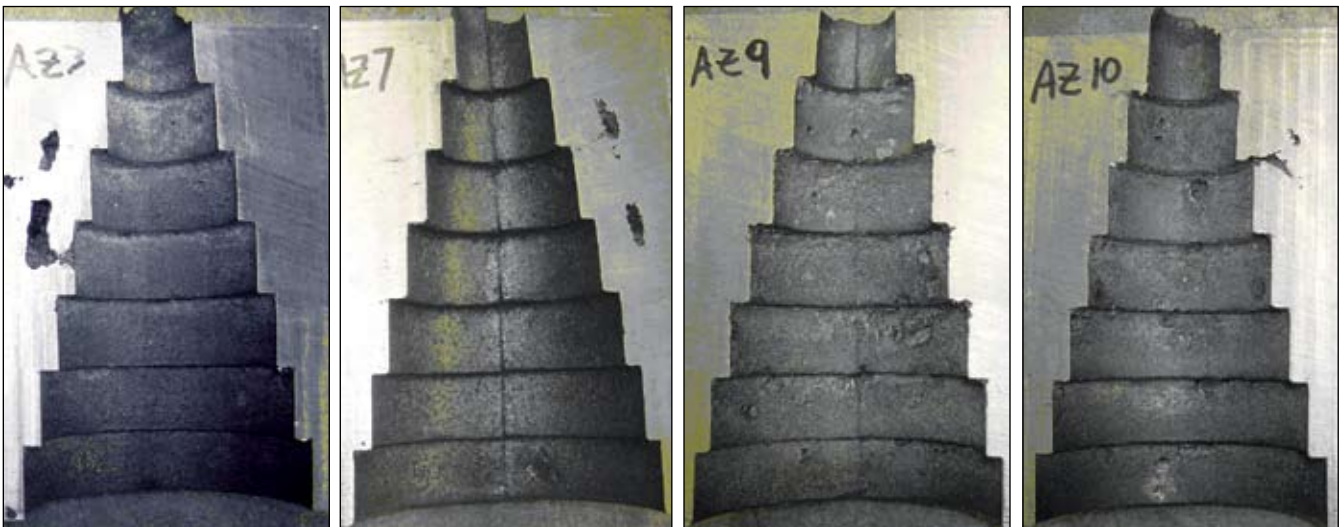
Veinseal HM for Steel was compared to chromite, zircon and reclaimed sand containing black iron oxide. After the tests, the UNI reported the following overall ranking of the four samples:

1. Silica sand with 7% Veinseal HM
2. Chromite sand
3. Zircon sand
4. Reclaimed sand, black iron oxide

Additional tests performed to compare the integrity of tensile strengths of the base sands and sand mixtures using a 1.1% binder percentage showed that zircon sand exhibited the highest tensile values. Veinseal HM "A" and Veinseal HM "B" reduced the tensile strength slightly from the baseline value of the 55 GFN silica sand. The five-minute strength for all samples was in excess of 100 psi and exhibited acceptable handling strengths

for most core applications. The largest decrease of tensile strengths was seen in the reclaimed sand/black iron oxide sample. It should be noted, however, that because of the high densities (weight per volume) of zircon and chromite sands, more resin was used in these sand systems in comparison to others, precipitating the higher tensile strengths.

At Badger Alloys, a time study was performed to examine the effectiveness of Veinseal HM for Steel at reducing the amount of time spent cleaning castings. During the study, the anti-veining sand mix was compared head-to-head with Badger Alloys' standard production sand mixes. With Veinseal HM, Badger yielded a 70% average reduction in time spent removing the veins from castings. **MC**
Visit www.igctechnologies.com for more information.



Silica sand with Veinseal HM at 7%

Chromite sand

Zircon Sand

Reclaimed sand with black iron oxide

Research conducted at the Univ. of Northern Iowa showed that silica sand with 7% Veinseal HM showed the best anti-veining characteristics, while reclaimed sand depicted the worst.