

FRC Global Sands





Expert Teams.



Quality Products.



Global Networks.

Who We Are

FRC Global is a leading supplier of refractories, electrodes, and high temperature combustion systems. FRC Global provides outstanding results for our clients within the iron, steel, and non-ferrous industries. Our company's reputation is built by delivering high quality products made with premium raw materials. We are more global now than ever before.

We give you a competitive advantage by offering you superior proven products that positively impact your bottom line and perform better. Our knowledgeable engineers ensure the proper application of our products to give you the maximum level of output and safety.

With over 25 warehouse facilities in the United States, Canada, Mexico, and South America we assure your products are readily available when you need them in these regions.

Through the use of vast global resources, all of us at FRC Global are committed to being the value creators and problem solvers for our industry.



Our Mission

Embrace modern technology to increase innovation, efficiency, and transparency. Inspire the next generation by driving change, promoting curiosity, and shaping sustainable solutions in the high temp world.





About Us

Background Information

FRC Global is a second generation family owned company with a 30-year history.

Global Offices

FRC Global has offices, agents, or partners in 20 countries around the world.

- North America: United States and Canada
- South America: Colombia
- Asia: China

We provide quality engineered products and services for all your high temperature applications.

FRC Global facts

Our quality control employees thoroughly inspect shipments to ensure products are within specification and are properly packaged.

Sales force and service needs are available in the following:

- North America
- Central America
- South America
- Europe
- Middle East



Why FRC Global?

We show up for high-temp potential.

For over three decades, we have built strong partnerships by living up to our reputation of showing up for our customers. Our team is made up of hard-working people—many who have been in your shoes and understand the challenges you face. We are constantly thinking ahead, anticipating new barriers, and providing better solutions.

Our team knows that no two challenges are the same. When we show up to understand you and your operation, we study it to ensure we propose solutions, not just products.

As a company full of dedicated product managers and meticulous quality control teams, we travel around the

world to produce high-end products from only the best raw materials. With seasoned engineers on staff, we identify opportunities for performance and production improvements.

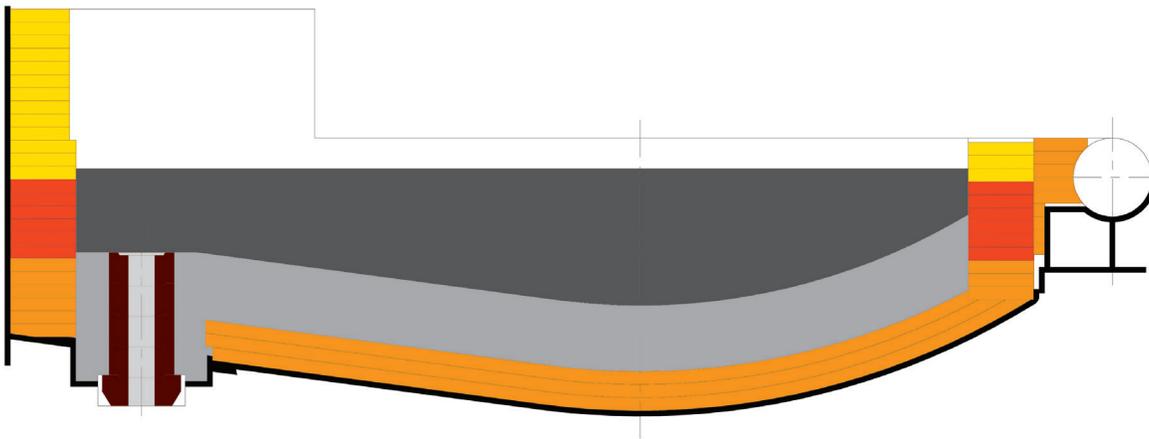
We are committed to excellence. Our strong relationships with global enterprises—primarily in strategic raw materials—ensure availability, performance, and consistent high quality. Our vast network serves as a cornerstone in our ability to deliver results on a global scale.

As proactive problem-solvers, we see your challenges as our own and look forward to achieving your project's greatest potential.

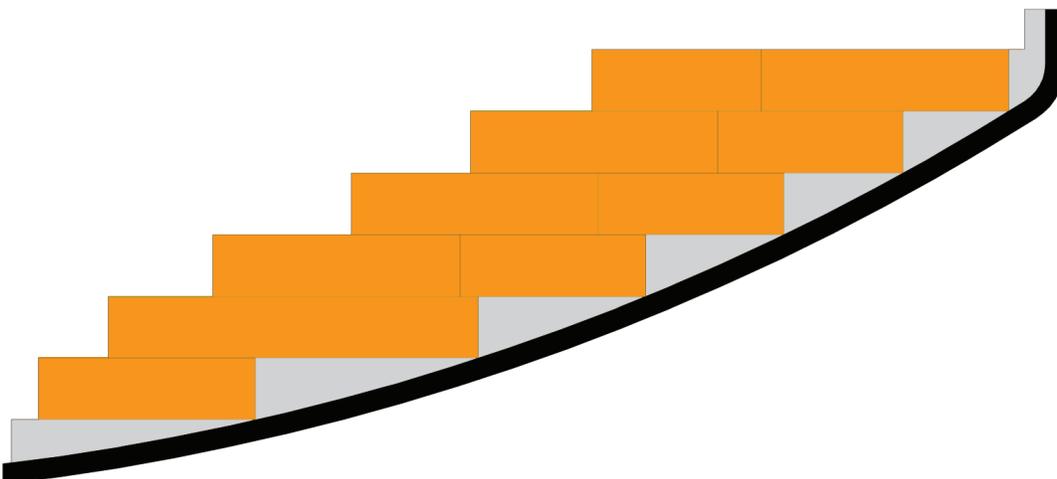
Magfill

Magfill is a synthetic calcined olivine with the dominant mineralogical phase forsterite. The uses for Magfill include EBT taphole fill, ladle nozzle fill, tundish insulation, and EAF stadium backfill. It is less dense than green olivine, it is more insulating and has no organics and no gas evolution. Due to the calcining and the mineralogy, there is almost no free silica.

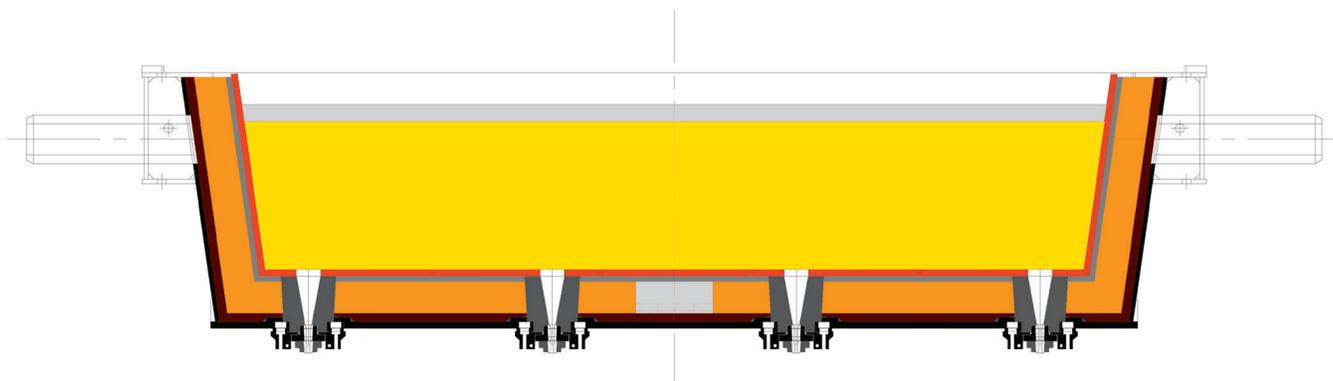
EBT taphole with fill



Stadium with Magfill backfill



Magfill tundish cover/insulator is basic yet lightweight and insulating.



Typical Chemical Analysis (% By Weight)

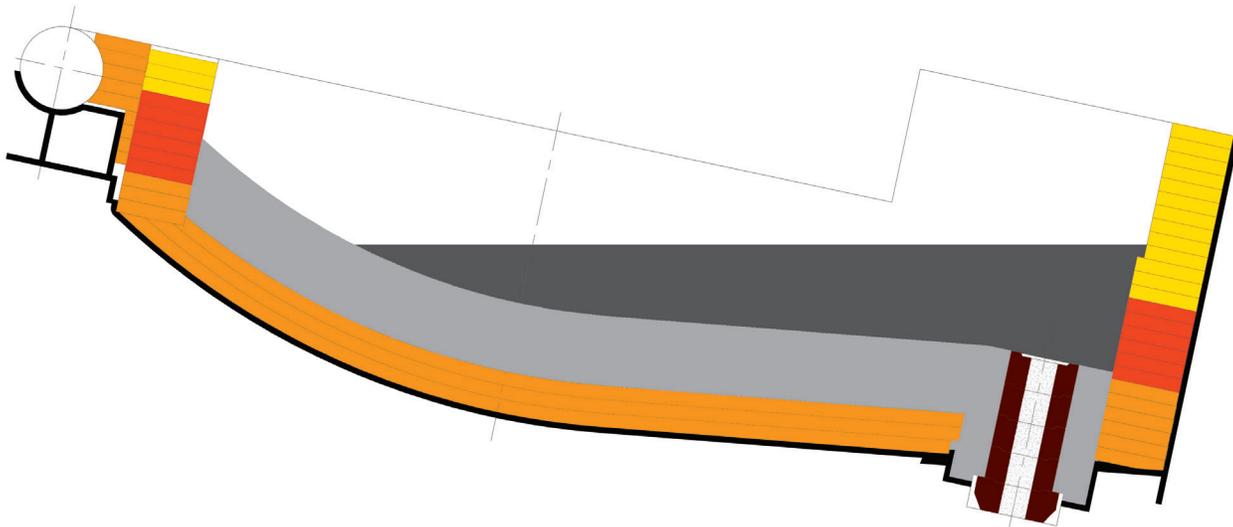
| | | |
|------------------------------------|---|-----|
| MgO | % | 53 |
| SiO₂ | % | 37 |
| Fe₂O₃ | % | 5-7 |
| Al₂O₃ | % | 2 |
| CaO | % | 2 |

Typical as Received Properties

| | |
|---|----------|
| Color | Brown |
| Fusion temperature (oC) | >1700 |
| Hardness (Mohs' scale) | 6 to 6.5 |
| Thermal expansion (% in/in) | 0.01 |
| Thermal conductivity | Very low |
| Bulk density (lbs/ft³) | 82-87 |
| Compacted density (lbs/ft³) | 93-100 |
| pH | 8.4 |



Magfill



How to maximize head pressure for EAF tapping

- Open taphole with furnace tilted as far as possible
- Run with the largest possible heel size
- Consider lowering hearth thickness at taphole and taphole height



Flosan

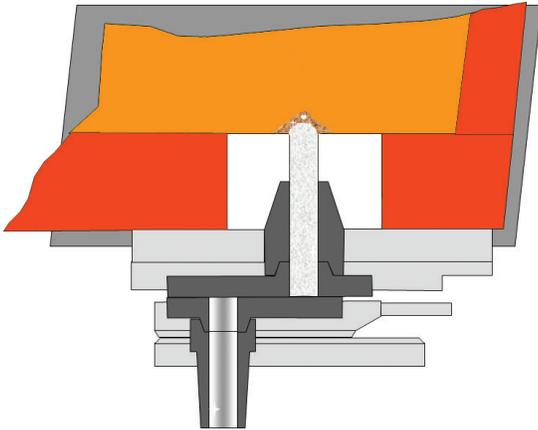
FRC Global's ladle nozzle fill, Flosan, has a range of chemistries for various grades, heat sizes, processes and bore configurations. From pure quartz to pure zirconia and chromite blends of each, FRC Global will develop a blend for your unique application.

Potential sources of non-free opening

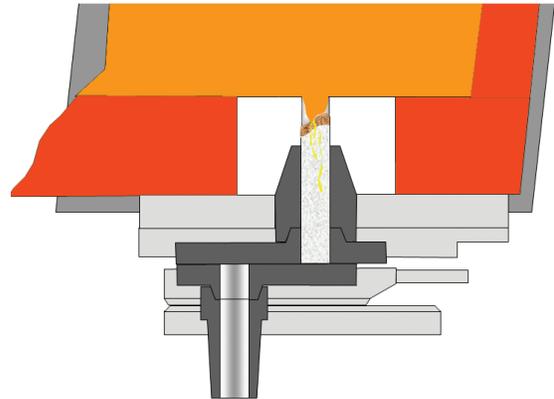
- **Ladle design:** wellblock located in or very near tap stream
- **Time:** increased sintering leads to thicker crust
- **Temperature:** too high- increased sintering, too low- slag/skull solidification over mound
- **Debris:** blocks bore
- **Build-up in bore (mortar and/or slag):** displaces sand, reduces bore diameter, creates choke-points
- **Lack of head pressure:** inability to break through crust
- **Small bore:** directly results in lower available head pressure, more resistance to sand flowing and minor obstructions are worsened by this condition
- **Impact/tap stream:** washes away mound, remaining crust becomes a plug
- **Wearing of block/volume changes:** smaller mound of different shape as block wears, new nozzle creates a lip/ledge inside the block

Flosan

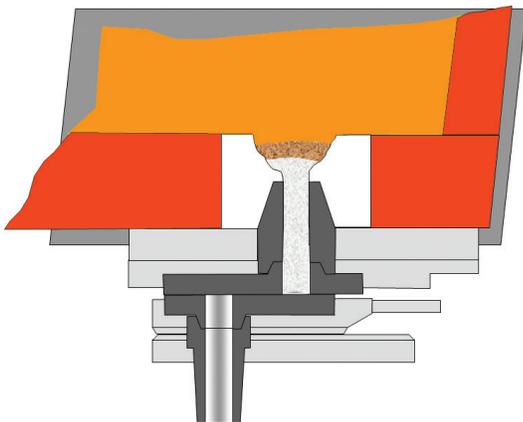
Proper mound



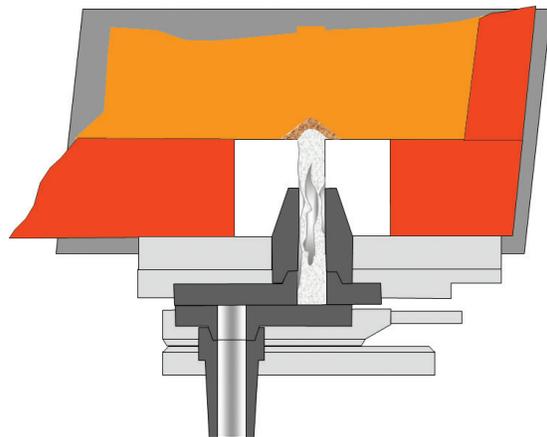
To little sand



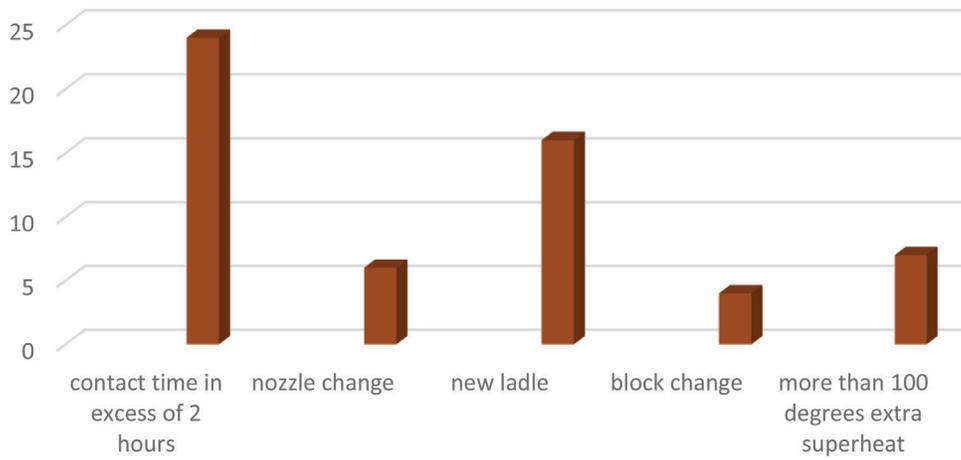
Worn block and obstructed sand flow



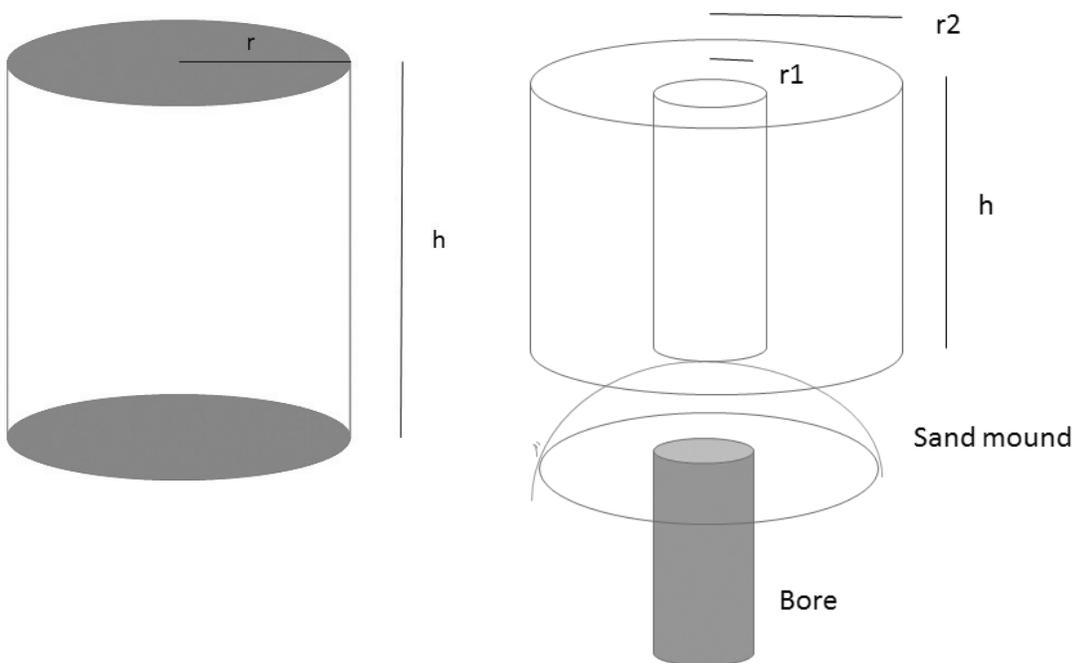
Something blocking the bore



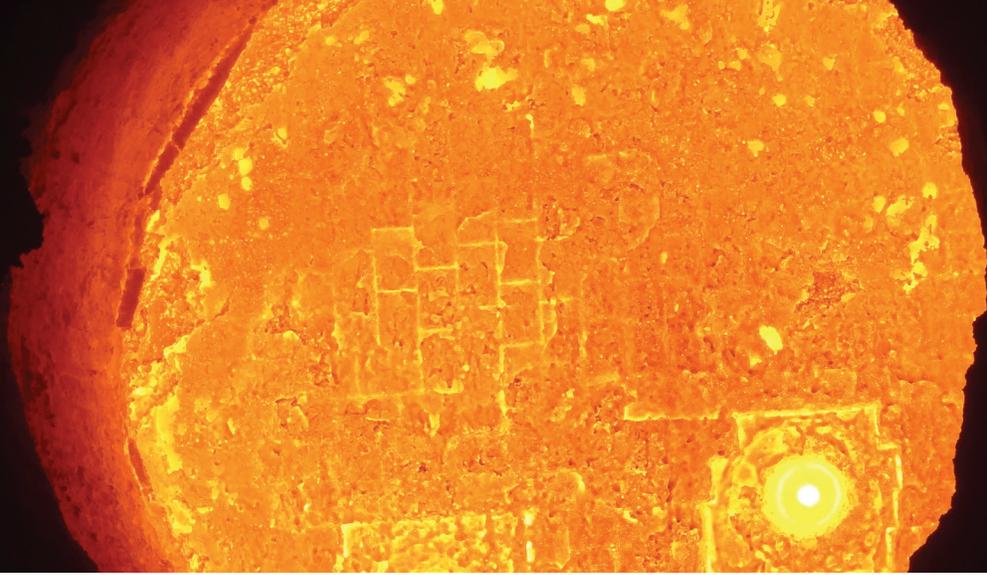
Sample Pareto Chart



A simple Pareto chart is very useful in determining the cause(s) of ladle non-free opens. It addresses the highest frequency causes first, and then continues monitoring.



For ladles with small bore/low head pressure, how to "cheat" by means of a large mound.



Flosan

| | Cr_2O_3 | SiO_2 | Fe_2O_3 | ZrSiO_4 | MgO | Al_2O_3 |
|----------------------|-------------------------|----------------|-------------------------|------------------|--------------|-------------------------|
| Flosan Normal | 36 | 24 | 18 | 0 | 8.5 | 12 |
| Flosan GDS | 34 | 28 | 17 | 0 | 7.5 | 11 |
| Flosan Z10 | 33 | 20 | 16 | 12 | 7.5 | 12 |
| Flosan Z30 | 28 | 16 | 14 | 30.5 | 6.5 | 10 |
| Flosan Z50 | 20 | 12 | 9 | 50 | 5.5 | 7 |



Delivery

Equipment



Handling



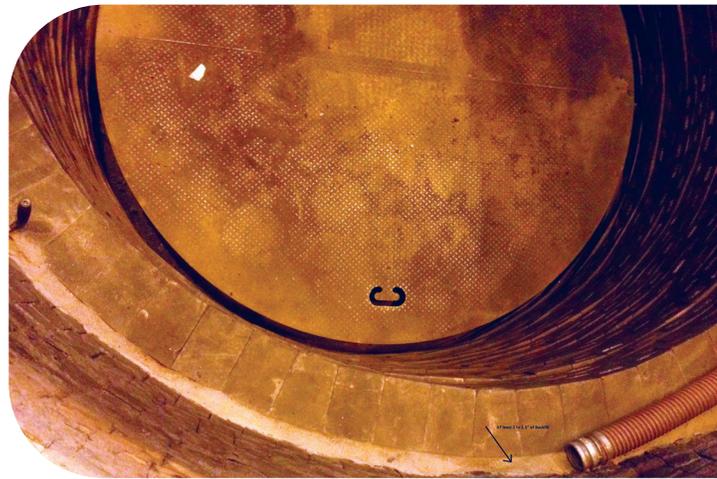
Handling



Installation

Ladlemag

FRC Global's ladle backfill, Ladlemag, is a synthetic olivine with or without a binder. Little or no free silica means the only concern is a nuisance dust. It is free flowing to minimize effort and time during installation. It sticks to the working lining, not the safety lining. It will flow freely from a hopper. Handling equipment is inexpensive and is very easy to maintain.





Demolition

Typical Chemical Analysis (% By Weight)

| | | |
|---|---|---------|
| MgO | % | 45-55 |
| SiO₂ | % | 35-45 |
| Fe₂O₃ | % | 5-7 |
| Na₂O(SiO₂)_x(H₂O)_x | % | 0-5 |
| Al₂O₃ | % | < 2 |
| CaO | % | 2 |
| L.O.I | % | < 1 |
| Others | % | 1.0-2.0 |

Typical as Received Properties

| | |
|----------------------------|-----------------|
| Standard size | 35-70 (40 mesh) |
| Density, pcf (g/cc) | 85 (1.36) |



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