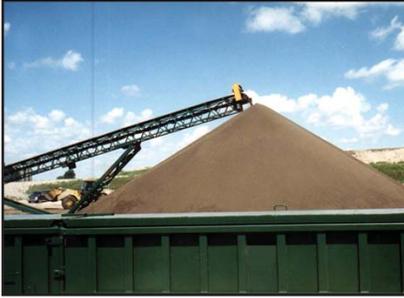


# Foundry Sands and Slags



Foundry sands operations.

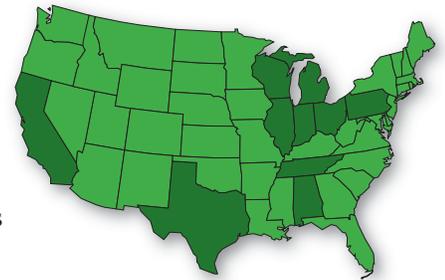
## Introduction

Foundry sands and slags are byproduct materials generated by metal casting processes at metal foundries. Metal casting is a metal forming technique used to produce metal parts ranging from automobile engine blocks and pistons, to plumbing fixtures to precision aircraft parts. Foundry sands are high quality silica sands used to make the molds for casting the parts. The sand is re-used until it is physically degraded, at which point it is removed from the sand supply. Foundry slag is composed of fluxing agents and impurities removed from the molten metal prior to casting. Foundry sands and ferrous foundry slags can be used as fine or coarse aggregates in construction and soil applications.

## Applications

Over 9 million tons of foundry sand are produced each year in the United States, primarily composed of sands from iron, steel and aluminum foundries. There are foundries in every state, but most of the sand is generated in the Great Lakes region, Alabama, Texas and California.

In the unprocessed state, the sand may contain chunks of sand and binder (typically bentonite clay), so crushing and screening may be required based on the final use of the material. Screened foundry sand is generally considered a non-plastic or low plasticity sand depending on the type and amount of binder. It typically has a uniform gradation, and has friction angle and cohesive strength similar to natural sands. The presence of the bentonite clays may provide superior compaction and better freeze-thaw performance. Foundry sand can be used in most applications that require fine aggregate and is particularly suitable for structural fills and embankments, road base layers, hot mix asphalt and flowable fill.



Top ten foundry production states.

Gray and ductile iron slag (air and water cooled) contains metal oxides and other minerals that make it a good low-cost feedstock for cement manufacturing. In addition, this slag has also been used as coarse aggregate in asphalt and in road construction.

## Environmental Benefits

Reusing foundry sands and slags has a positive impact on the environment in a number of areas. Substituting foundry sands and slags for virgin aggregates produces significant energy and water savings, in addition to reductions in greenhouse gas emissions and particulate matter emissions. Where foundry sands and slags are locally available, they are competitively priced and may also reduce aggregate transportation costs and impacts.

Recent studies have shown little uptake of trace metals from iron and aluminum foundry sands. These studies show that trace metal concentrations in most clay-bonded iron and aluminum foundry sands are similar to those found in naturally occurring soils. While leachate from these sands may contain trace element concentrations that exceed water quality standards, the concentrations are no different than those from other construction materials such as native soils or fly ashes. As a result of these analyses, the U.S. Environmental Protection Agency has endorsed the use of properly managed ferrous and aluminum foundry sands as construction materials.

For more information, see:  
 Foundry Industry  
 Recycling Starts Today  
[www.foundryrecycling.org](http://www.foundryrecycling.org)