

Metal Industries



Metal Smelting plant

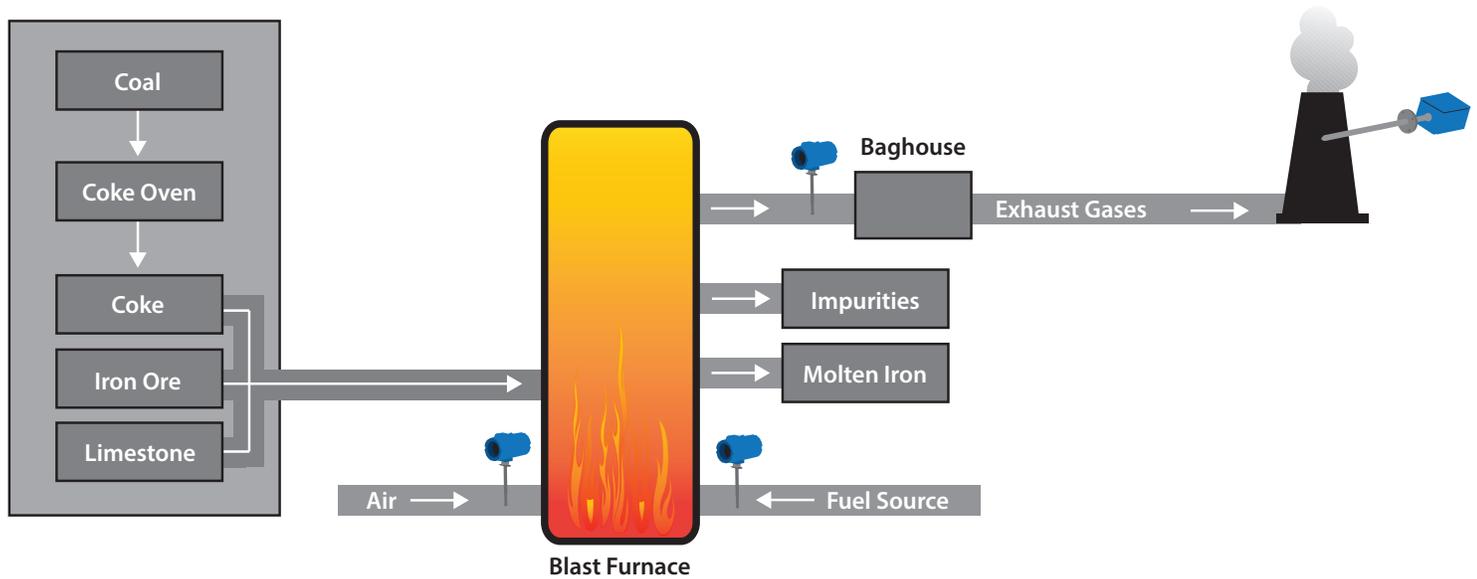
Kurz loosely refers to any facility that produces metals as the ‘metal industries.’ This category includes primary and secondary industrial metal sources such as smelters, foundries, metal refineries, steel mills, and metal recyclers.

- Smelters produce a base metal from its ore using heat and a chemical reducing agent
- Foundries cast metals
- Metal refineries remove impurities and oxides from metals
- Steel mills include iron making, steel making, casting, and product rolling
- Metal recyclers collect, separate, and remelt metal components

The foundry industry use furnaces to melt materials into metals or remelt metals. Air is blown into the furnace as part of the mixture.

- Smelters use a blast furnace for mixing the coke, iron ore, and limestone, and a smelter can have additional furnaces for producing specific metals. For example, steel-making can include a basic oxygen furnace (BOF) to create low-carbon steel.
- Foundries can include a holding furnace or reduction furnace where additional materials are added or removed.
- Metal refineries and recyclers can use a rotary furnace for separating metals.

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Simplified Foundry Process

Aluminum, cast iron, and steel are the most common processed metals.

Foundries are also a source for byproduct materials used in other industries. The majority of coke produced in the United States comes from byproduct coke ovens. The coke is prepared in brick furnaces and volatile gas byproducts (primarily ammonia, coal tar, and gaseous compounds) are collected and saved.

In recovery coke plants the waste gas exits into a waste heat recovery boiler which converts the excess heat into steam for power generation.

In nonrecovery coke plants, gas byproducts collect in a common tunnel and exit via a stack.

Many foundries use generated heat to run boilers for site power requirements, which involves measuring combustion air flow and fuel flow to boilers, and measuring stack exhaust gas. Specific installations have included flow meters used in the following applications:

- Measuring furnace air
- Measuring combustion air to blast furnace
- Natural gas, combination air to blast furnace and reheat furnace
- Monitoring exhaust, stack, and emission gases
- Baghouse flow
- Argon or chlorine gas flow, SNIF process in Basic Oxygen Furnace (BOF) area
- EPA Method 14 stack flow (aluminum only)
- Nitrogen blanketing
- Continuous caster pneumatic systems
- Coater line exhaust flow