

Cupola Furnace Basics

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Cupola furnaces are the easiest and most economical furnace to work with for the small foundry owner. Hobby metal casters are always on a look out for a cheaper alternative which will provide safety and yield quality results and the cupola furnace delivers all this.

The common appearance of a cupola furnace is that of a smokestack. The furnace can be of nearly any size which is perfect for backyard metal casters. Commonly, the cupola furnace is supported on four legs with a drop bottom to remove any waste from the furnace. This type of furnace does not use a crucible so the metal caster will place the metal to be melted inside of the furnace. The furnace is fitted with a sprout and runner to pour the molten material which is called a taphole. Sometimes cupolas are fitted with a way for slag to be removed. The slag tapholes are located near the back of the cupola a little higher than the other taphole. The refractory used in cupolas are usually brick with the bottom being clay and sand as this is just temporary anyways.

Cupola casting usually involves working with iron and bronze, though other alloys like aluminum can be melted as well.

The common fuel source for cupolas is coke with limestone acting as a flux. Air can be pumped in to increase the burning of the coke. When the coke is hot enough the alloy is introduced in the top of the cupola. Some will place the alloy then fresh coke and then more alloy. The molten alloy will drip through the coke to collect in the well near the taphole. When the level of the molten alloy is high enough, the taphole is opened and then alloy runs into a ladle. When enough has poured the taphole is closed with the use of a refractory plug. Remember, cupola casting does not involve a crucible.

Crucibles are traditionally used to melt the alloy and then collect it in the molten state. With the use of tongs the crucible is carried to the mold and poured. The ladle takes the place of the crucible in this regard. The metal caster pours the molten alloy which is in the ladle into the mold. The most common metal casting process is Sand casting which lends itself well with cupola furnaces.

Cupola furnaces can either be purchased or constructed. Many hobby metal casters prefer to construct their own cupolas finding it difficult to find a furnace to fit their size requirements or their budget. Cupolas have been made from coffee cans large pipes and really just matters on what materials the caster is able to procure. By making your own furnace you will be able to customize it. Many will need a furnace to be small and portable. No one wants to leave a furnace out in the rain, after all. The chances are pretty good that if you are into metal casting then you have some of the technical knowledge needed to make your own cupola furnace. If not, then it is worth a shot just be extremely careful. You may want to find someone in your community that can aid you in your endeavor.