

Status of the Foundry Industry in Oklahoma

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In recent years Oklahoma has realized the need for attracting new industries to the state, and is seeking through publicity to arouse out-of-state interest. However, there is a lack of published material on some of the older industries located in the state. The foundry industry is an outstanding example.

The foundry industry is one of the oldest branches of engineering, and remains one of the most important. Basically the principles of founding are the same today as in the past, despite advances from a crude art to an exact science. The pattern, molding, core, melting, and finishing departments compose the average foundry. Foundries are classified by the type of metal they cast. The two major divisions are ferrous and nonferrous.

Ferrous castings include gray iron, steel, and malleable iron. Of the three, gray iron is most popular in Oklahoma due to the low cost of raw materials, moderate casting temperature and simple methods of molding. Steel castings are tougher and more resistant to shock than cast iron. This method is less popular because of the expensive melting equipment required. Malleable iron castings cost about fifty per cent more than gray iron due to the need of higher temperatures. Oklahoma does not have a malleable iron foundry.

Nonferrous castings include aluminum, copper-base, magnesium, lead, zinc, kirkcote, and other alloy castings. Aluminum is popular because of the light weight of the metal. Brass, bronze, and other similar metals are heavy and expensive to cast, but are in great demand to fill Oklahoma's industrial orders for bearings and machinery parts.

Only eleven of the 77 counties of Oklahoma have foundries. Since Tulsa and Oklahoma counties are the chief industrial and population centers of the state, they are the logical centers for foundry concentration, having a combined total of 41 foundries. This is 73 per cent of the states 56 establishments.

There are 28 ferrous foundries in Oklahoma. They are not, however, evenly distributed over the state from an areal viewpoint. The southern and western sections of the state are not industrialized sufficiently to warrant the location risk. Fifty per cent of the ferrous foundries are located in Oklahoma and Tulsa counties. The two foundries in Kay county employ more men than all of Oklahoma County's fifteen ferrous and nonferrous firms. This is due in part to the successful marketing of Kay county castings in the Oklahoma City area. The only steel foundry in the state is located in Tulsa. This firm has 447 employees. The average foundry in the state employs 26 persons.

There are 39 foundries producing nonferrous castings. Tulsa county accounts for 51 per cent of the nonferrous group. The smallest Oklahoma foundries are located in the nonferrous group. They often enter the ferrous casting field to enjoy the benefits of two market fields.

Seventy-one per cent of Oklahomas foundries have less than twenty employees. The smallness of the individual units can be more clearly realized by the 21 foundries having four or less employees.

Over 62 per cent of Oklahoma's gray iron foundries have productions of less than fifty tons. It is important to understand that weight alone is not regarded as a measuring stick with certain metals. Aluminum castings for example are light in weight but worth much more per pound than heavy metals.

Oklahoma uses eighty per cent scrap in its cupola charges. This is due to the abundant supply of scrap in the state and is one of the major factors of economical foundry operations. On the other hand, pig iron is not produced in Oklahoma, so all requirements for this metal must be shipped in from other states. Daingerfield, Texas is the chief source of supply since it is nearby. Thus, pig iron is obtained at a lower cost. Small amounts of pig iron are shipped in from Illinois, Missouri, Utah, and Alabama.

Metallic ingots are obtained from a variety of sources, according to the type of metal. Copper alloys are purchased largely from Kansas City, Missouri, and Lincoln, Nebraska, with small amounts obtained from other places in Missouri, Illinois, and Alabama. Aluminum ingot is obtained principally from Kansas City, Lincoln, and local scrap smelters located in Tulsa and Oklahoma City. Small amounts are obtained from Cleveland, St. Louis, and Arkansas. Oklahoma smelters furnished completely the state requirements for pure zinc and lead. However many foundries cannot utilize pure zinc, so they buy from St. Louis, where the Oklahoma zinc is alloyed by the addition of copper, aluminum, and other metals.

Commercial flux is purchased largely from out of state while limestone and dolomite is found in abundance within the state.

The state is richly endowed with petroleum, natural gas, and coal. Coke, however, is not manufactured in Oklahoma. Coking coal is mined in the McAlester area and is shipped to the Lone Star Steel Company at Daingerfield, Texas. There coke can be purchased and returned to its native state. The major source of coke for Oklahoma cupolas is Birmingham, Alabama. Oklahoma foundries use all these commercial fuels as well as electricity to melt the metallic charge. This fuel is used to operate thirty cupolas with 115 tons per hour capacity; two electric arcs with 4,500 lbs. per charge; 78 crucibles with 39,330 lbs. per charge; eight non-crucibles with 2,800 lbs. per charge; and four reverberatory furnaces with 2,300 lbs. per charge.

Molding and core sands are obtained locally with the Canadian and Arkansas river beds providing the greatest source of supply. Tripoli sand is found in the northeast area of the state, and is used for mold partings. Bentonite is found in the northwest section of Oklahoma and is used as filler or binder in molding sand.

The foundry industry provides employment for 1,451 Oklahomans. The industry has 148 office and supervisory personnel, 155 coremakers, 303 molders, and 845 general employees.

There are 32 jobbing foundries in the state, so called because they depend upon the open market to sell their products. On the other hand there are ten firms that produce castings for their own use only. They are called captive foundries. Sometimes production requirements of captive foundries become so small the shop can not maintain an efficient force of employees. To remedy this situation they often enter the jobbing field. Oklahoma has 14 of these combination establishments.

Oklahoma's industrial market distribution of foundry products are industrial machinery 55.8 per cent, agriculture 9.5 per cent, domestic home use 7.1 per cent, aircraft 6.4 per cent, plumbing and furnaces 5.1 per cent, structural components 4.1 per cent, automotive 3.8 per cent, railroads 1.0 per cent, and all others 7.2 per cent.

Foundry products vary greatly in size and weight. Examples of ferrous products are water and oil pumps, water pipe and fittings, glass bottle casting molds, sewer tops, tractor parts, and tools. Some aluminum products are: ornamental designs for home decorations, auto-coil spring shims, foundry patterns, fence fittings, seasopes, and greenhouse heater

parts. Combined nonferrous metal foundries produce military aircraft parts, pipe line materials, medical supply parts, oil field parts, and foundry patterns of all types.

Most Oklahoma foundries depend upon local state markets. Generally speaking, the smaller the foundry the greater the concentration in local markets. The exception is the nonferrous group which specializes in ornamental and specialty work that is light in weight and is shipped all over the country. Texas is the second largest market area with Missouri and Kansas following. The remaining markets are scattered in every state of the Union. A small amount is shipped to South America and other parts of the world.

A widespread effort to improve the technology of founding has not materialized. As a result, Oklahoma foundries face increasing competition from metal working industries other than castings. Numerous products that were once cast are now being manufactured by other means such as forgings, rollings, steel weldments, and stamping and pressing. These competitive industries became important due to improved technology.

Oklahoma foundries should likewise improve their methods. The industry has a low productivity rating in the state. This can, in part, be blamed on the lack of an organized effort to train skilled men in the industry. A step forward in this direction was the National Youth Administration Foundry Schools operated at Chickasha and Durant, in 1942-43. Oklahoma today profits from this group, as some of them located within the state and a few are owners of foundries.

The industry should also profit from the training received from educational shops in the state. For example, Oklahoma A. & M. College has a cupola furnace and two crucible type furnaces for training purposes. The training received there, at the University of Oklahoma, and at several state high schools should blend with efforts of the industry to produce skilled and highly trained foundrymen for future development of the industry.

Oklahoma offers the industry many advantages. A few important ones are: (a) the central location of the State, being near the geographic center of the United States; (b) the excellent railroads and highways that connect local markets with several surrounding states; (c) a plentiful supply of foundry materials such as scrap metals, sands, dolomite, limestone, and low-cost fuels that make for economical operations; and (d) a huge petroleum industry within the state that requires large amounts of castings.

The Oklahoma foundry industry has grown from a few establishments in 1900 to its present size of 56 foundries. As long as the state continues to expand industrially, the foundries will no doubt continue to increase in numbers and size.