What You Should Know About Porcelain Enamel

THis booklet is addressed to the salesmen, advertising men and others interested in promoting the sale of porcelain enameled products. It hopes to give you, as one of this group, a better understanding of porcelain enamel, something of its origin, where it comes from, and to tell you the interesting story of its manufacture.

For a number of years porcelain enamel has been used because of its superiority as a finish. It has more or less gone forward of its own accord. But with the aggressive promotion of other materials and finishes, often inferior, it is becoming increasingly important that manufacturers and retailers utilize to the fullest extent the sales advantages offered by porcelain enamel. Lack of familiarity with these points indicates the need for this booklet. The sales points are already there. It remains for you to make them work for your benefit.

As one interested in promoting the use of this product, it is your problem as well as ours to emphasize porcelain enamel as a superior finish and, in publishing this booklet, it has been the purpose of the manufacturers, wholesalers and dealers represented in the Porcelain Enamel Institute to give you information that will enable you to show why there is no substitute that possesses the important qualities of Cleanliness, Durability and Lasting Beauty to the same degree as porcelain enamel. If, in doing this, we have helped to make your sales or advertising message more effective, our booklet will have served its purpose.

Porcelain Enamel Institute, Inc.

Third Edition.
Porcelain Enamel Is a Product of Ancient Art and Modern Science

Porcelain Enamel was used for both ornamental and practical purposes long before the Christian era, and while statues, jewel chests and similar objects of art were the first known porcelain enameled products, the Europeans soon began to use it as a finish for kitchen utensils. The Chinese and others of the Orient were the first enamelers, but their output was eventually eclipsed by the more progressive manufacturers in Germany and Austria.

In America, the public was quick to realize the cleanliness, durability and lasting beauty of this finish. As a result the industry has grown until porcelain enamel is now used extensively in nearly every phase of our existence. Modern science and industry have been largely responsible for the universal use of porcelain enamel, for it was not until improved production methods were introduced that porcelain enameled products could be marketed at a reasonable price. Porcelain enameling has been called "the highest attainment in ceramic art," but scientific and mechanical methods have made porcelain enamel a product that rivals others in quality, volume production and consumption.

The Four Corners of the Earth Provide Raw Materials for Porcelain Enamel

ONE wishing to visit the sources of this product would find it necessary to employ the services of several railroad and steamship companies, as well as to explore some of the earth's more remote sections. Our first trip
would be to Chile and Russia, where there is nitrate of soda (saltpetre). In Germany, we would find vallendar clay. Greenland with its icy mountains would be our next stop, for here are the world’s cryolite deposits, so essential to porcelain enameling. Canada supplies nickel oxide and cobalt, and we would return to Russia for manganese or get it from Newfoundland, since deposits of this material are found in both places.

On our return trip the first stop could be in New Jersey, Maine, Tennessee, Connecticut or the Dakotas for feldspar and quartz, or we could find the latter in Illinois and several other states. In Illinois and Missouri we would find large deposits of fluorspar, or we could get that in Kentucky. Soda ash, another ingredient, would be found in either Michigan, Ohio or Virginia. Then a long jump to California for a supply of borax would end our journey. The trip would have been interesting, but no more so than the manufacture of these ingredients into a finished piece of lustrous porcelain enamel.

How Porcelain Enamel Is Fused Into Iron or Steel

PORCELAIN enamel has not always been produced in a scientific manner. For centuries its manufacturing process was a kind of mystery, but science has established itself in the industry to such an extent that modern porcelain enamel is no longer a mystery, but the result of the combined efforts of scientific research and analyses.

The materials brought from the four corners of the earth are put together and thoroughly mixed. The mixture is smelted at a high degree of temperature into a molten mass of glass. When heated for a sufficient length of time, it is released into
The iron or steel base must be thoroughly cleaned in acid tanks such as these before applying porcelain enamel.

a large tank of water and, because of its sudden contraction, is crumbled into a mass of fragments. In this state the glass is known as "frit."

The next step is to mill or grind the frit with water, clay and color oxides, where color is required, until it reaches a creamy state.

The enamel is now ready for dipping or spraying on iron or steel sheets, after the metal is thoroughly cleaned.

Each piece of iron or steel must be dipped or sprayed, after which it passes through a dryer, then into a furnace where it is brought to a white hot temperature. This is one of the most significant processes in the application of the porcelain enamel finish, for the non-porous enamel must be fused into the pores of its metal base. The quality of the finished product depends largely upon this operation. One or two additional coats of enamel are applied in the same manner, depending upon the part that is being enameled, and the product is then thoroughly inspected.

In the kitchen you will find some of the best examples of porcelain enameled products. In this connection it answers those rigid requirements of the housewife—Cleanliness, Durability and Lasting Beauty. Porcelain enamel possesses these required qualities to the highest degree. It is well to stress these points, for past experience has proved that the housewife demands that her cooking utensils, stove or range, table top, refrigerator and other household equipment answer these requirements. In addition, remember that foods may be cooked in porcelain enameled utensils with absolute safety.

Here's an effective display that increases enamelware sales.
WHAT YOU SHOULD KNOW

One of the most important points to consider when selling kitchenware is that porcelain enamel is non-soluble, for the housewife will be glad to know that cooking utensils finished in porcelain enamel will not in any way discolor, nor cause foods cooked in them to discolor, or change their flavor in any way.

Stoves and Ranges

AND it is these qualifications that make porcelain enamel the superior finish for stoves and ranges.

The first porcelain enameled stoves and ranges were manufactured more than twenty years ago. The easily cleaned, durable and beautiful porcelain enamel finish has been a large factor in reducing the housewife's drudgery. Most women have a vivid remembrance of the old kitchen stove or range, whether it was gas-, coal- or wood-burning, and it is easy for them to realize the advantages and increased efficiency of the porcelain enameled stoves and ranges you are selling them today.

In every community there are stoves and ranges that should be replaced. Many housewives are still looking forward to the day when their respective kitchens will be equipped with a stove or range that is easily cleaned, more durable and of lasting beauty. In porcelain enamel all these qualities are combined, for stove and range manufacturers are now constructing their products from an artistic standpoint to take full advantage of porcelain enamel. The lasting qualities of these artistically designed stoves and ranges are unlimited.

Refrigerators

REFRIGERATORS provide an interesting and important use for porcelain enamel because they must be durable, sanitary and easy to clean. It is true that

ABOUT PORCELAIN ENAMEL

the interiors of most refrigerators are porcelain enameled, but often the exteriors are finished in paint or lacquer, often confused with porcelain enamel. For this reason, it is important that a prospective buyer should know the refrigerator is finished in porcelain enamel, inside and out. Should you go into the average home and ask whether the refrigerator is finished in porcelain enamel, the answer probably will be "Yes," simply because the difference between true porcelain enamel and other finishes known as "enamel" is not understood.

You will create in the housewife's mind a keen desire to have one of these beautiful all-porcelain enamel refrigerators by pointing out to her the feeling of satisfaction to be derived from having a refrigerator in her home that may be cleaned by merely rubbing a damp cloth over its surface; a refrigerator that is in no way affected by humidity, and one that will not scratch, peel, rust, discolor or otherwise show signs of wear.

Washing Machines

ANOTHER widespread use of porcelain enamel is in the washing machine industry, where a group of progressive manufacturers have found it to be the solution to numerous difficulties that have confronted them since the first washing machine was built.

The original wooden tub was impractical and its successor, the galvanized tub, proved to be unsatisfactory for a number of reasons. The industry then tried copper, but finally, after extensive experiments and grueling tests, it was found that porcelain enamel was the best finish obtainable for use on washing machine tubs.

For a long time the washing machine was looked upon as a utility and little thought was given to its appearance, but as in the stove industry, manufacturers learned that the housewife wants something which is easily cleaned as well as
efficient, and that if the equipment possesses the additional attribute of beauty, its sales possibilities are further increased.

By using porcelain enamel, the washing machine industry has given the housewife a product that is non-porous, which means that it will not rust or corrode and may be cleaned by merely wiping it off with a cloth. These factors, together with those of lasting beauty, permanence and economy, are evidence of the superiority of porcelain enameled washing machines.

**Table Tops**

**Porcelain** enameled table tops are universally used. They will not scratch and those of a higher quality are stainproof, two factors that must be considered when presenting the qualities of a table top to the housewife. Table tops finished in porcelain enamel may be cleaned by merely wiping them off with a cloth; their beauty is lasting and constant use has no effect upon their lustrous surface. Remind the housewife that the surface of these table tops is of the same material as the finish on her porcelain enameled stove and that hot dishes and pans, or hot liquids and greases will not affect it in any way.

**Signs**

**Durability** and permanent attractiveness also make porcelain enamel popular in the sign field. Porcelain enameled signs are extensively used by important national advertisers in their sales promotion work. Long life and economy are responsible for their wide use by companies who have adopted uniform lettering and design in their outdoor advertising displays. Everyone is familiar with signs of the various oil companies, signs furnished to garages by automobile manufacturers and signs appearing in front of nearly every confectionery, drug store, battery station, lumber yard, cigar store and grocery in the country.

The qualifications of porcelain enamel are just as applicable to signs as any other product. Porcelain enameled signs are now in use that were erected twenty-five years ago. This is made possible by the fact that they do not require painting, are easily cleaned, legible, brilliant, retain their inherent beauty and possess a great degree of permanence.

Porcelain enamel as a finish for neon signs has become popular almost over night. Since such a finish requires no upkeep, a percentage of tube breakage is eliminated, which existed formerly when the background plate was repaired or repainted.

Other arguments that may be advanced to promote the sale of signs finished in porcelain enamel are found in the fact that they will not peel, discolor, rust or tarnish; they eliminate replacement cost; their colors make them attractive; first cost represents the entire investment.
WHAT YOU SHOULD KNOW

ABOUT PORCELAIN ENAMEL

-for Cleanliness, Durability and Lasting Beauty-

Upper left—Porcelain enamel refrigerator and table top; above center—a range in marbled porcelain enamel; upper right—porcelain enamelled parlor heater of lasting beauty; left center—porcelain enamelled boiler; oval at left—a familiar kitchen scene in which porcelain enamel plays an important part; oval at right—an example of the use of porcelain enamel in sign manufacture; lower left—porcelain enamelled machine of modern design; lower right—refrigerated display case finished in porcelain enamel.
Reflectors and Floodlights

Porcelain enameled steel reflectors and open-type floodlights light modern industry and are widely used for playgrounds and recreation fields, such as miniature golf courses, tennis courts, and baseball and football fields. The diffusing properties of the porcelain enamel reflecting surface, which results in soft and well diffused illumination, is pleasing to the eyes of employes or those participating in games. The most economical operation of the lighting system is assured by the high efficiency, ruggedness and permanency of porcelain enameled reflectors. Furthermore, the white porcelain enamel reflecting surface does not tarnish nor discolor.

Soap and water will keep porcelain enameled reflectors spotless, and no matter how many times they are cleaned, the reflecting surface will not be affected.

This exceptional lighting of a miniature golf course was made possible by porcelain enameled reflectors.
Porcelain enamel's durability is another reason for its superiority. And remember that durability is the housewife's second requirement.

The basic materials used in the manufacture of porcelain enamel are all inorganic; hence its ability to withstand deterioration which often disfigures other finishes. It has already been stated that porcelain enamel will not tarnish, rust nor discolor; neither is it easily scratched. If you wish to prove the latter, draw the edge of a coin or knife blade sharply across a porcelain enamel surface. You will find this has no effect. Try the same test on a lacquer or paint enamel surface and you will see why porcelain enamel is the superior finish.

Lasting Beauty

Beauty is one of the best sales points in favor of porcelain enamel and, while considerable mention has been made of the beauty of porcelain enameled products, it is well to remember that this beauty is *lasting*. There is no other finish that has this quality of retaining its luster and beauty through the years.

The craze for color, which has swept through the American consumer's mind during the last few years, has been created by the manufacturer and his advertising efforts in quest of increased sales. Following closely, if not keeping a little ahead of Mr. and Mrs. Buyer's likes and dislikes, the porcelain enameling industry has produced stoves, ranges, refrigerators, kitchenware, table tops, parlor heaters, washing machines, etc., in a sufficient number of finishes to give you the opportunity of selling the housewife one that will fit into the color scheme of her kitchen, laundry or parlor, and only with porcelain enamel can she be sure of the permanence of color.
Market for Porcelain Enameled Products Is Unusually Broad

No matter whether you are a manufacturer, distributor, salesman, or whether you are engaged in the business of advertising porcelain enameled products, it is highly important that you know these qualities which make it superior. In the foregoing pages an attempt has been made to give a brief account of these qualities. The Cleanliness, Durability and Lasting Beauty of porcelain enamel are, however, the outstanding factors that make it a superior finish.

The market for porcelain enameled products is unusually broad. The use is constantly increasing. Those of us who are engaged in the manufacture, distribution, sale and advertising of porcelain enamel and porcelain enameled products, have an opportunity to further expand the market by presenting the fine qualities of this superior finish constantly and enthusiastically.

How to Feature Porcelain Enamel in Your Advertisements

For the benefit of those who are concerned with the advertising of porcelain enameled products, or who refer to it in their sales talks, it might be well to devote a little time to the phraseology that should be used when referring to materials with this finish.

In times past porcelain enamel has been referred to as “vitreous enamel,” “porcelain enamel” or “enamel.” Vitreous enamel means the same as porcelain enamel, but the word “enamel” used alone often means just paint or lacquer. In order to avoid confusion, the industry has selected the term “porcelain enamel” to designate this finish.

With a Minimum of Care, Porcelain Enamel Will Last Indefinitely

Porcelain enamel will usually last just as long as the user wishes, and with moderately careful handling will last indefinitely.

A minimum amount of effort will keep porcelain enamel spotlessly clean; no scraping or use of abrasive compounds is necessary. If, in the case of kitchenware, food sticks to the vessel, it may be easily removed with a little bicarbonate of soda in warm water. Housewives have found, however, that there is less “sticking to the pan” when they use porcelain enamelware than is the case with other types of cooking utensils. It is well to remember that stoves and ranges should be permitted to cool before washing.

Any finish requires some attention and consideration. Porcelain enamel responds more quickly to cleaning and, after it is cleaned, presents a better appearance than other finishes.
WHAT YOU SHOULD KNOW

It is true that manufacturers of some products, particularly refrigerators, find it to their advantage to say in their advertisements: “Porcelain on So-and-So,” or “Porcelain fused on So-and-So” so the consumer will not confuse it with paint or lacquer finishes. With the adoption of “porcelain enamel” as a standard name, however, it is reasonable to believe that in a short time we shall not be confronted with the problem of having porcelain enamel confused with products done in the often so-called “enamel” finishes.

Uses of Porcelain Enamel

For your convenience, some of the uses of porcelain enamel are given below:

Aeronautical instruments  Electrical typewriters  Ranges
Airport lighting  Film developing jars  Reflectors
Automobile manifolds  Flashlights  Refrgerators
Bakers’ machinery and supplies  Food machinery  Roofing shingles
Barbers’ supplies  Furnaces  Sanitary ware
Bathroom fixtures  Hand grips  Scales (all types)
Billboards  Hand rails  Scale dials
Blackboards  Heaters (all types)  Semaphore
Building materials  Hospital supplies  Signs (all types)
Burial vaults  Humidifiers  Soda fountains
Butchers’ fixtures  Kitchen cabinets  Spandrels
Cabinets  Kitchen sinks  Store fixtures
Chairs  Kitchen utensils  Stoves
Chemical tanks  Laundry machines  Surgical equipment
Cinder catchers  Laundry trays  Table tops
Circuits: breakers  Litter baskets  Table trays
Coal chutes  Locks  Telegraph apparatus
Clock faces  Mail boxes  Telephone dials
Cuspidors  Metal specialties  Thermometers
Decorative and artistic purposes  Meter faces  Tile
Dishwashing machines  Milk car linings  Vending machines
Display and showcases  Mullions  Vending machine plates
Drinking fountains  Name plates  Washing machines
Drip pans  Oil burners  Washing machine covers
Electric irons  Oven control dials  Waste receptacles
Electrical supplies  Photographic equipment  Water coolers

ABOUT PORCELAIN ENAMEL

Quick Facts for Salesmen

Porcelain enamel’s greatest selling quality is its Cleanliness, Durability and Lasting Beauty.

Will porcelain enamel chip?—Not if handled with a reasonable amount of care. Do not strike it sharp blows. Do not strain it by twisting. Do not clean it with gritty substances. Do not wash it while hot.

Porcelain enamel is a finish of lasting beauty, with the added advantage of an iron or steel base, giving it strength.

Porcelain enamel is not affected by atmospheric conditions. No substitute possesses this advantage to the same degree as porcelain enamel.

Porcelain enamel will not rust.

Porcelain enamel will not discolor. It is non-porous.

Porcelain enamel may be obtained in colors to match the color scheme of the kitchen, laundry, bathroom and even the parlor.

Porcelain enamel cooking utensils are absolutely non-soluble. Foods may be cooked in them with absolute safety.

Porcelain enamel refrigerators have gone through fires hot enough to melt their handles. The finish was unharmed.

Porcelain enamel signs are in use that were erected twenty-five years ago. They are superior for their brilliancy, legibility and rustproof qualities. No maintenance costs.

Porcelain enamel stoves will not discolor and will last longer. They are easily cleaned, not affected by heat, add to the charm and beauty of the kitchen.

Porcelain enamel reflectors have greater diffusing qualities, are more attractive, last longer, will not rust, and are more easily cleaned.

Porcelain enamel washing machines will not corrode, are easily cleaned, have greater beauty and are more economical.

Porcelain enamel cooking utensils, laundry trays, drain boards, washing machine covers, table tops, etc., are more easily cleaned than others;
WHAT YOU SHOULD KNOW

if given a minimum amount of care they will last a lifetime; they present much better appearance and have the other inherent qualities of a porcelain enamel finish.

When stressing the beauty of porcelain enamel, remember that it was first used for ornamental and artistic purposes, and now it has become a commercial product.

Porcelain enamel will not scratch. If you wish to prove this, draw the edge of a coin sharply across a porcelain enamel surface. It will have no effect. Try the same test on a lacquer or paint enamel surface. You will see why porcelain enamel is the superior finish.

For further information write the

Porcelain Enamel Institute, Inc.,
612 North Michigan Ave.,
Chicago, Ill.