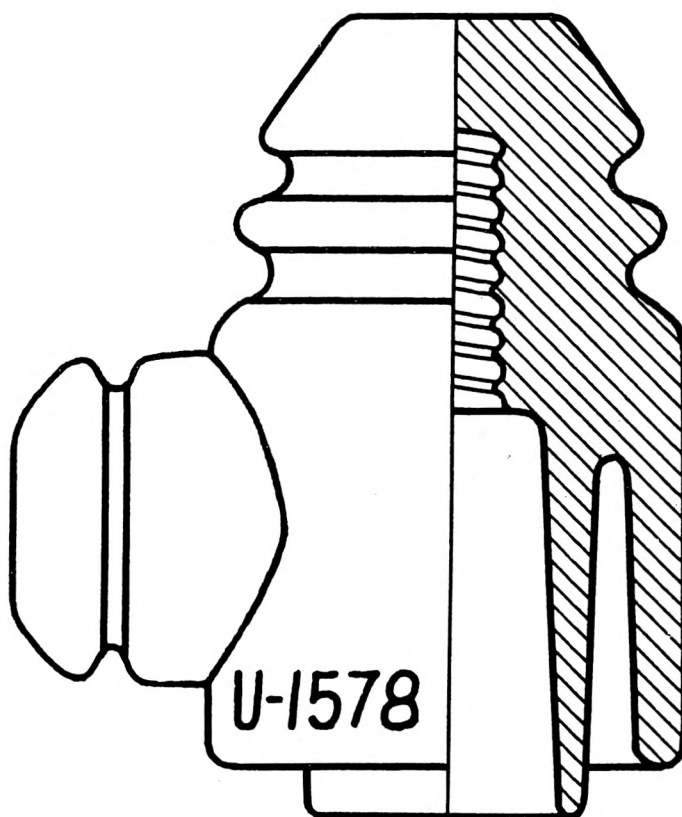


WORLDWIDE PORCELAIN INSULATORS



**By Marilyn Albers
and Jack H. Tod**

Privately published

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PREFACE

As with other pioneering research books on insulators, we have drawn a line to publish the information now at hand as a starting point, and it is anticipated that this procedure will greatly accelerate obtainment of further information for a succeeding edition. It is naturally much more difficult to research foreign insulators than local ones, since specimens are fewer and well scattered, and it is a chancey situation to visit any of the many countries involved to obtain firsthand information. In many instances, the only information we have for a country comes from one to several insulator specimens reportedly found in that country or from the sales catalog of a manufacturer located in that country.

The cornerstone of this book is the Universal Style Chart with scale drawings and reference numbers for every different style of pin type that we have been able to locate thus far. This chart is an extension of the author's previously published Universal Style Chart for U.S. insulators, and those 950 styles are not repeated in this book. The source of data for some of these drawings was manufacturers' catalogs, but the majority of the drawings were made from specimens, using the "shadow profiling" method explained in the appendix.

Of prime interest to all collectors is the attribution of specimens to the various countries and also to specific manufacturers if possible. The tabulated data in the appendix in many cases will assist in this by leading the reader to the textual information and markings related to the insulator style involved.

The authors are indebted to several manufacturers who fulfilled our request for information on the company and for catalogs of the insulators they manufacture. Some catalogs were furnished by collectors,

A number of the drawings were made possible by collectors furnishing us with shadow profile and dimensional data, and some of the more complicated styles were sent on loan to us so drawings could be made. We wish to thank all these people who have been so helpful in this compilation, but it is impractical to try listing all the many names. Hopefully there will be a good deal of satisfaction to each one knowing that the drawing of their insulator or the recording of its marking will make this book a better tool for themselves and all others using it as a reference.

We will now continue the effort of gathering information from world-wide insulator manufacturers on past and current styles made, but a great deal of added information on styles and markings can be had from insulator specimens in the hands of collectors. The authors would welcome very much any information from collectors which would expand the listings in this book. In all but very unusual cases we can make very satisfactory drawings of insulator styles from mailed data without having to actually see the specimens. Please address all correspondence to:

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U.S.A.

ABOUT THE AUTHORS

Marilyn Albers of Houston, Texas began collecting insulators in 1973, and her interest in foreign insulators was stimulated by several trips to Europe. Since 1979 she has been the Foreign Insulator Editor of Insulators magazine. In 1981 she compiled the book Glass Insulators from Outside North America, a companion book to this one on porcelains.

Jack H. Tod of Phoenix, Arizona began collecting insulators in 1967, and since 1972 he has been the Porcelain Insulators Editor of Insulators magazine. He researched and published in 1971 the book Porcelain Insulators Guide Book for Collectors on pin types, and then in 1976 A History of the Electrical Porcelain Industry in the United States on wiring insulators.

The work of producing this book was shared between the two authors. Mrs. Albers researched and compiled the historical data on the countries, the insulator markings and information on the manufacturers. Additionally she furnished catalog information or shadow profile data on all specimens in order that the uniform scale drawings could be made.

Mr. Tod wrote some of the text, made all of the insulator drawings in the Universal Style Chart from data furnished by Mrs. Albers, prepared all the final camera-ready copy, printed and bound the book.

-o-o-o-o-

POLE LINE CONSTRUCTION PRACTICES

(North American Countries)

Construction of communications lines in North America was influenced by the wide open spaces where the long toll lines were situated and by an abundant source of cheap timber. Standard toll lines used pin spacing of $11\frac{1}{2}$ " on crossarms up to 10' in length (10 wires), and even the smaller pony size of telephone crossarms used a pin spacing of nearly 10".

In the United States, the earliest insulators for mounting on cross-arm pins were simply wedged down onto tapered wooden pins, using a burlap or tar to tighten the fit. Needless to say, dangling insulators were the result in many instances. In the 1860's the method was changed to use of threaded insulators on threaded pins, a much more reliable arrangement. Because the pins were of wood, the pin size was a relatively large size of 1", and which has remained the standard to the present day. Insulator styles are generally broader than European styles to accommodate this pin.

Power lines developed in the late 19th century in the United States followed this same pattern of spread-out massiveness for the same reasons of wide open spaces and abundant timber. For these lines, the standard 1" pin was used from the outset, but a standardized $1 - \frac{3}{8}$ " pin was also adopted for use on heavier lines.

In summary then, except for early "threadless" insulators and a few very specialized cases, all communications and power insulators ever used in North America have a standard 1" or $1 - \frac{3}{8}$ " threaded pin hole (pitch of $\frac{1}{4}$ threads per inch) and tend to be larger and chunkier in design than the comparably used styles in most other parts of the world.

(Other Countries)

Development of communications line practices in Europe probably was influenced by a less abundant source of timber and by the fact that the lines were erected in so many crowded areas, such as the very confining streets of the old towns and cities there. Instead of the massive wooden poles and long crossarms, European lines used stubby angle-iron crossarms on steel poles. The crossarms were much closer together, pin spacing was very close, and considerable duplexing was used (pairs also run under the arms at each pin position).

As in the United States, the very early European insulators probably were mounted on unthreaded pins, but more probably cemented on steel pins instead of wooden pins. Furthermore, as opposed to the U.S. development, the British started with compact porcelain designs made to fit the small steel pins (which they also term "spindles"), and that method is still the current practice in Britain and the countries influenced by their design. Some British designs of communications insulators are made to screw onto threaded steel pins, but generally the practice elsewhere is to cement insulators onto pins.

Since these insulators do not "screw" onto pins, the "threads" used in their pin holes can generally be of any style or pitch, and the taper and diameter of the pin holes is not uniform between different manufacturers or different styles. These "threads", annular rings or plain sanded holes serve only to make a firm bond with the cementing. It is suggested the nature of pin hole size and "threads" be ignored when cataloging any items against those shown in the Universal Style Chart.

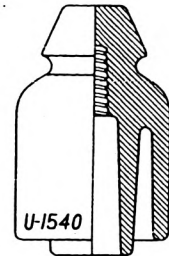
A number of the larger power insulators used outside North America also allow for cementing onto steel pins, but a larger number of these are purposely designed to screw onto threaded steel pins. But here again we suggest you ignore pin hole details when cataloging these.

SPECIAL INSULATOR DESIGNS

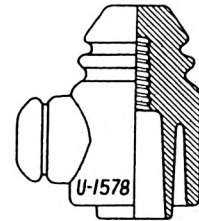
The design of ordinary pin type insulators basically has not changed since the very first designs were created over a century ago. The minor changes evolving over the years have in some cases been to accommodate an easier production method, and in other cases due to the ever-increasing size of conductors on power lines.

Some specific designs have been created for use in particular electrical or mechanical applications. We still are uninformed on the special use of some of these, especially those with through-holes in the area of the crown and ones with unusual groove shapes. Information on a number of special designs is given below.

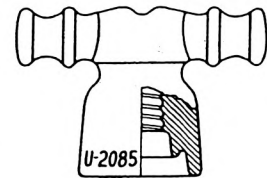
CORDEAUX insulator. This is the classic early British design of communications insulator and which over a century later is manufactured basically without change! Because British communications systems have for so long been under the direction of a single government agency, the design of other styles is usually just a variation of this eminently practical design. A two-groove version is made for double termination use, and various sizes are made for different types of lines. This basic type of insulator has been used for so long in so many world areas under British influence that it has influenced the design of communications insulators in many countries where pole line construction methods parallel European practices.



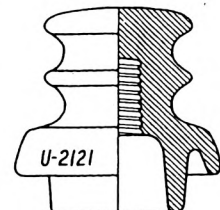
SPUR insulator. For applications where the direction of a line abruptly changes from horizontal to a vertical route. Also similarly when a tap line is taken off the through line either vertically or nearly so. This side knob also appears on some designs of "dry spot" insulators since the lead-in wires to those are nearly always run vertically.



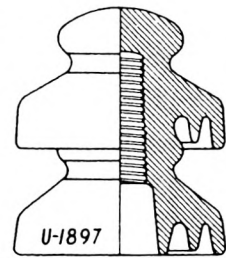
We do not know the industry terminology for this special design, or its primary use, but it appears designed for applications where a pair of wires is transferred from one horizontal level vertically to a different level. Substantially identical designs are made which have an arm on only one side.



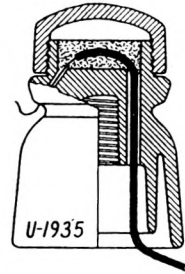
LOOP insulator. So called because it is used on a through line to also deadend the secondary service loop wires, and which are wrap spliced to the through conductor. Ideally suited also for a BREAK insulator for series applications, where the conductor from one direction deadends in the top groove, and the other in the bottom groove. In the "loop" application, there is zero voltage groove-to-groove, and in the "break" application there is relatively small voltage groove-to-groove but a high voltage from the grooves to the grounded pin. Knowing this, it is easy to distinguish any of these 2-groove designs which are not meant for use as telephone transpositions.



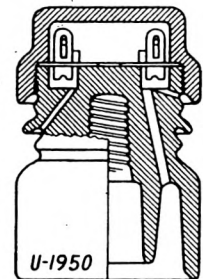
TRANSPOSITION insulator. There is a degree of electrical mutual coupling between any parallel conductors, and this is a function of conductor spacing. The unequal coupling between the two conductors of one pair to other conductors on the pole lines causes an imbalance, creating crosstalk between lines. This is eliminated by "twisting" the pair wires by means of transposing their pin positions and even transposing complete pair positions. The transposition insulator is used on the middle pole of a two-pole span of line to secure the vertical part of the rolover. A good transposition insulator design has a sheltered leakage path between the conductors and also from both to ground.



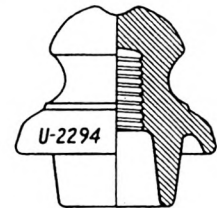
DRY-SPOT insulator, but also referred to by the British as a "terminal insulator" from its use as such. Styles vary as to one or two holes for lead-in wires etc., and one design having a side knob is called "terminating spur insulator". The purpose of these insulators is to provide a "dry spot" on the insulation of the lead-in wire, thereby breaking the wet-weather shorting path from the line wire over the insulation of the lead-in wire to ground. A U.S. patent covers this design, #898,921, Sept 15, 1908, Thomas F. Purves and others, London, England.



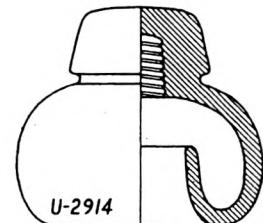
TERMINAL FUSING insulator. For applications where bare communications wires cross or are in close proximity to power wiring, as a safety feature. A better arrangement is to use communications wires with a sturdy insulation whenever this situation arises. A comparable design in Bakelite is known in the U.S. A patent exists covering these fused insulators, U.S. #761,814, June 7, 1904, Aaron Bease of Syracuse, New York.



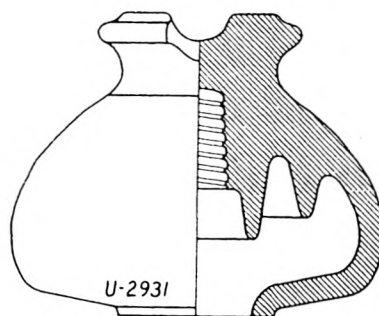
We have not yet made inquiry to any of several factories to determine the reason for the small step in the surface of the skirt below the wire groove on numerous European insulator designs. This step is the normal termination of the radio treatment on the top of porcelain insulators yet the step occurs on some insulators so small they would be operated at voltages not requiring radio treatment. Also, this same skirt step occurs on numerous glass insulators of European design.



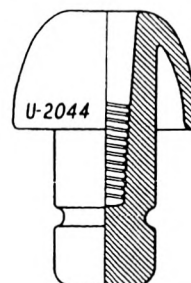
OIL RESEVOIR insulator. This is the classic Johnson & Phillips' liquid insulator patented in 1878, and it was the first design intended to cope with contamination of the leakage path. Although actually made experimentally and used on early lines in Europe, it was soon found to create more problems than it solved. An H. G. Winslow of Pittsburgh (U.S.A.) patented a two-piece oil reservoir type similar to the one in the Style Chart of this book -- U.S. patent #524,659, 8/14/94, but there is no record of it ever having been made.



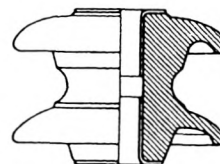
FOG BOWL insulator. This general design originated approximately 1930 by two U.S. companies -- Ohio Brass Co. and Locke. The bowl-shaped bottom helps in maintaining a clean undersurface in the regions of severe contamination. The name stems from the fact that even slightly contaminated insulators tended to flash over when the fog came in. Just fog itself is a problem, since it tends to wet every surface exposed to it, whereas rain doesn't ordinarily wet the insulator underparts.



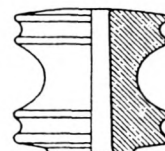
UNDERARM insulator. This insulator is used in any number of applications where the mounting pin projects downward, as in duplexing, the running of extra wire pairs under the crossarm, although duplexed circuits in Europe are usually added by normal insulators mounted on "J" pins. Allegedly another application of underarm insulators is a more safe method of mounting wires on poles where there is an upward pull on the wires, as in canyonous areas.



SHACKLE insulator. Although not the subject of this book, we picture this one to give its correct terminology and to describe its use. This insulator is used for dead-ending communications circuits directly on poles or other vertical surfaces, or on crossarms to avoid the use of ordinary pin types mounted on "J" bolts. There are similar versions with a less severe skirt overhang for the same use and for installation in various types of transposition brackets.



SECONDARY RACK SPOOL. The 3-wire or 4-wire secondary loop to houses is normally dead-ended at the house on a metal rack having a single long through-pin to secure these, one for each wire. These secondary racks may also be found on poles for the same use. Occasionally these spools will be seen mounted singly or in rows by use of shackles to hold each spool, and this is always the case where uninsulated secondary wires are run from pole to pole.



COUNTRIES AND MANUFACTURERS

AUSTRALIA -- DIA (Doulton Insulators, Australia Pty. Ltd.)

Founded in 1815 by John Doulton with a small pottery in Lambeth, London, England, making stoneware figure jars, plain jars and bottles. The introduction of the electric telegraph in the 1840's created a need for ceramic insulators, and Doulton was the first potter to supply these. Insulators for telephone systems, early power stations and electric railways were subsequently developed by Doulton.

Continued expansion through the years resulted in the Royal Doulton group of companies, and since 1956 the subsidiary companies have been responsible for the manufacture and sale of distinct product groups. In 1956 Doulton bought the established API (Australian Porcelain Insulators Pty.) and renamed it DIA (for Doulton Insulators Australia Pty. Ltd.). This company is the foremost Australian manufacturer of high voltage porcelain insulators, and it also acts as agent in Australia for the English Doulton insulator factory located in Tammworth, South Wales, England.

DIA manufactures many types of insulators for use in Australia, and also for export to Iran, Mexico, Canada, Romania, Hungary and many other countries of eastern Europe. The typical API and DIA trademarks are shown below. The older API insulators are still in use in Australia.

API



AUSTRALIA -- Kopple Potteries

We have no information on this company other than it being located in Adelaide, South Australia. The marking used on their insulators is shown below.

KP
56

AUSTRALIA -- Imported Insulators

A number of insulators found in Australia are of English or Japanese manufacture and are so marked (see England and Japan for these markings). Many others are unmarked, such as U-1502 which was used on the original Overland Telegraph line (circa 1872) between Adelaide and Darwin. This insulator is a treasured oldie. We cannot be certain who manufactured it, but Buller, Jobson & Co. of London, England showed an identical insulator in their 1885 catalog with a notation that it was for Australia.

AUSTRALIA -- Unattributed Markings

Insulators are commonly found in Australia with the markings shown below, all of which are unattributed at this time.



A 37

FB
43

SUNSHINE
34

R.F. LTD
43

BELGIUM --

No information, but we have identified in the appendix tables some specimens which were found in Belgium.

BRAZIL --

No information.

BULGARIA --

Several telephone and low voltage power insulators have been found in Bulgaria with the unattributed marking shown below.



BULGARIA
1975

CANADA -- Canadian Ohio Brass Company

Originally incorporated in 1922 by The Ohio Brass Company (Ohio) as The Dominion Insulator & Mfg. Co. Ltd., located in Niagara Falls, Ont., name changed to Canadian Ohio Brass Company in 1928. The insulator line closely parallels that of the parent U.S. company, and the company's main market is Canada.

At this writing, we have not yet researched the possible markings on insulators made by either Dominion or Canadian Ohio Brass.

CANADA -- Canadian Porcelain Company, Ltd.

Established 1912 in Hamilton, Ontario, largely under the direction of and with the backing of Locke Insulators, Inc., Victor, N.Y. Walter Goddard, formerly with Locke, was the original president and manager, and by 1938 he became the sole owner of the business.

The very early insulators paralleled the Locke line, but differences and completely new designs evolved throughout the years. The company not only supplied insulators for the Canadian market but also was an exporter to foreign markets.

Markings on specimens include a number of varieties of plain C.P. initials plus variations of the Monogram-CP, the registered trademark of the company. Some of these are illustrated below.

Ⓟ

C. P.

C. P.

CANADA -- The Dominion Insulator & Manufacturing Company, Ltd.

(See Canadian Ohio Brass Company)

CANADA -- Hamilton Porcelains, Ltd.

(Research on company history currently incomplete.) The company is located in Hamilton, Ontario (as of 1972, P.O. Box 594). Known specimens attributed to the company are all U-1192 exchange insulators. Currently six marking varieties have been located on associated communications pole lines in Canada, and these are listed below. The Monogram-HP marking is the company's trademark.

HP / STROMBERG CARLSON (all on rim)
STROMBERG CARLSON / MADE IN CANADA (all on rim)
HP (front of skirt), MADE IN / CANADA (back of skirt)
HP (on top of crown), MADE IN CANADA (on rim)
HP / MADE IN CANADA (on rim), CTS (on crown)
P. P. INC. (on crown, nothing elsewhere)

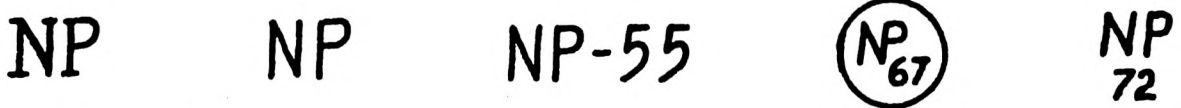
The company indicated by letter that they made these insulators in the 1930 - 1945 period. Since the P.P. INC. marking is that of Porcelain Products, Inc. (a U.S. company), and since the HP insulators were made in dies identical with ones used by P.P. Inc., we presume HP obtained these dies when P.P. Inc. closed down the Findlay, Ohio plant, HP subsequently creating all these recess-embossed markings by a continuous change of the soldered-on brass marking strips in the dies.

Stromberg Carlson was for a manufacturer of telephone supplies and which was headquartered in Rochester, New York.

The CTS was for Chicago Telephone Supply Co., also a manufacturer of telephone supplies.

CANADA -- National Porcelain Company

Located in Medicine Hat, Alberta, a subsidiary of Medicine Hat Brick & Tile Co., and which is a subsidiary of I-T-E Corp., a U.S. company. The company made pin type insulators for many years until the plant burned in about 1973 and was not rebuilt. The company sold the insulator business to another company which manufactures some electrical porcelain items, but no pin types. Typical recess-embossed, incuse and underglaze markings used by National Porcelain on pin types are shown below. Numbers in the markings apparently indicate the year of manufacture.



CANADA -- Smith & Stone, Ltd.

Research is incomplete at present, but the following information is available. Established in 1920, a manufacturer of both wet and dry process porcelain plus other insulating materials. Plant is located at Two Glen Road, Georgetown, Ontario. Sales offices are in Toronto, Ontario.

To date, few specimens of pole line insulators have been attributed to this company, but rack spools and a distribution pin type are reported which bear the markings as shown below. Some of their insulator markings may also include the words "MADE IN CANADA" with these other markings.

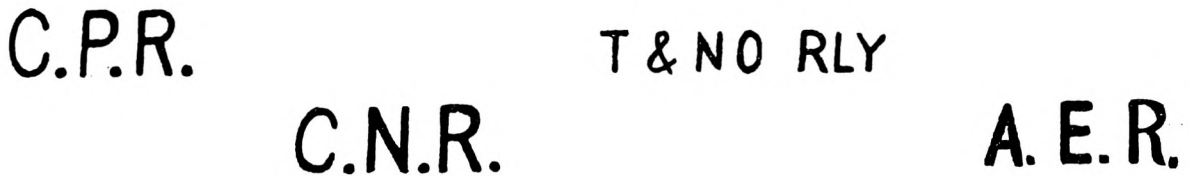


CANADA -- Miscellaneous Insulators and Markings

For many years (roughly 1897 - 1920), porcelain insulators in Canada were imported from U.S. and British manufacturers.

A number of the communications styles have the appearance of British manufacture, some of which do have Bullers' markings. Another particular insulator of beehive style has a marking of "GISBORNE PATTERN".

Shown below are four markings found on beehive styles on Canadian railroads. The C.P.R. is for Canadian Pacific Railway Co., C.N.R. is for Canadian Northern Railway, and both of these were made by Pittsburg High Voltage Insulator Co. (U.S.) -- with incuse markings or underglaze markings in either blue or green ink. The T & NO is for Temeskaming & Northern Ontario Railway. The A.E.R. is unattributed, but it was found on a spur of the Algoma (Electric?) Railway in Ontario.



CHINA -- Dalian Insulator Works

This factory is located in the city of Dalian and manufactures insulators for the China National Machinery and Equipment Import and Export Corporation (CMEC), which has its headquarters in Beijing, China. We have no information other than a Dalian catalog showing a line of export pin type and suspension insulators available in American or British standards. The Dalian marking on insulators is shown below.



CHINA -- Unattributed Markings

The following two markings found on insulators from China are as yet unattributed.



MADE IN CHINA

CZECHOSLOVAKIA --

No information, but we have identified in the appendix tables some specimens found in this country with the following unattributed markings.

EPL55 C3.

HUDACO 25300

DENMARK --

We have no definite information, but it is almost certain that the marking shown below is that of a Danish manufacturer.



1952

ENGLAND -- AI (Allied Insulators) Industrial Products Ltd.

Allied insulators was established in 1959 with the merger of two existing companies, Bullers Ltd. (q.v.) and Taylor, Tunnicliff & Co. Ltd. (q.v.). The new company steadily expanded, and because it had two distinct areas of activity (ceramic components and metal fittings), a new holding company was formed, known as AI Industrial Products Ltd. There are nine factories within this group, the main plant being located in Stoke-on-Trent.

AI makes low- and high-voltage insulators for telecommunications lines and electric railways, and other poleline hardware items. Their products have been exported to many countries including Ireland, Finland, Sweden, Norway, Holland, West Germany, Switzerland, Italy, Afghanistan, Bangladesh, India, Korea, Spain, Australia, Canada, South America and the United States.

The company trademark appears below, but we have found no insulators with this marking. It is a known fact that the company continued to use the Bullers trademark until at least 1969, and most likely still does.



ENGLAND -- Bullers Ltd.

Established in 1840 by John Buller as a small family pottery in the village of Bovey Tracy in Devon, England. With the coming of the electrical age, the company moved to Hanley in Stoke-on-Trent and began making electrical insulators. By 1868 it was an established supplier of insulators and related hardware.

In 1885 Buller purchased the metal foundry of Jobson Brothers (once located in Dudley) at Tipton in Staffordshire, and the name became Buller, Jobson & Co. A catalog issued under the Buller, Jobson name listed many forms of porcelain insulators including pin types, and these listings are of value in tracing the origin of some early styles of pin types. They also noted numerous particular styles made for export to South America, Canada, New Zealand, Australia and many European countries. The catalog showed the U-1502, used in Australia, and the U-1135, known as "Gisborne" Pattern" and used in Canada.

In 1890 the firm became a public company, and the name was changed to Bullers Ltd.

In 1912 the telecommunication system in England was taken over by the General Post Office, and their insulators supplied by Bullers carried both the Bullers marking and the initials G.P.O. Bullers also supplied insulators to railways requiring identifying initials (ie. GWR for Great Western Railway, LNER for London & North Eastern Railway, LMS for London, Midland and Scottish Railway, etc.).

In 1959 Bullers Ltd merged with Taylor, Tunnicliff & Co. (q.v.), and the merged companies became Allied Insulators Ltd. The following markings and their variations can be found on Bullers insulators.

(next page)

(BULLERS markings)

JOBSON BROTHERS
DUDLEY, ENGLAND

BULLERS LTD
LONDON



GWR

LNER

GPO



LMS

GISBORNE PATTERN

ENGLAND -- Doulton Insulators Ltd.

This company is a subsidiary of the Royal Doulton group of companies (also see "AUSTRALIA -- DIA") which began as a small pottery in Lambeth, London in 1815. The insulator business had its start in London in about 1900. Doulton made various styles of insulators for the General Post Office telecommunications system, for railway lines and for low voltage distribution applications.

In 1926 the Central Electricity Board was formed, and an intense program of power line construction began, causing a sudden demand for large quantities of high voltage transmission and distribution insulators. The present Doulton insulator operation owes its success to entry into the field at that time.

The Tamworth Plant was built in 1936, and since that time a complete line of porcelain insulators has been manufactured there. As the need for domestic construction slowed, the company turned more to export business and which now accounts for about 70% of their total volume.

Insulators made by Doulton are marked with the company's trademark which is shown below.



ENGLAND -- G and G Porcelain Insulators

"G and G" stands for Gaskell and Grocett, established in 1870 at Port Hill Bank, Longport, Stoke-on-Trent. During their years of insulator manufacturing, they made pin types and small electrical porcelain insulators. The company was forced to close in 1969 when the land was required for a land development scheme. Though nothing remains of the original works, Chris Grocett, a great grandson of one of the founders, owns a domestic pottery business, Portmeirion in Stoke-on-Trent. It is not known if this company manufactures insulators.

Two variations of the G & G trademark are shown below.



ENGLAND -- Macintyre

It is not known where this company was located or how long it was involved in insulator manufacture. However, it is certain that they made insulators for G.P.O. in England, because specimens have been found which bear both the G.P.O. marking and the Macintyre name as shown below.

MACINTYRE

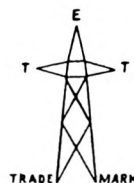
ENGLAND -- Taylor, Tunnicliff & Co. Ltd.

Founded as a small factory in 1867 by engineer Thomas Taylor and potter William Tunnicliff at Shelton, near Hanley, Stoke-on-Trent. Soon the plant was enlarged and moved to Eastwood, Hanley. Tunnicliff retired in 1895, and a private limited company was formed.

Toward the end of the 19th century Taylor, Tunnicliff began specialized production of insulators, and a factory designed for the production of high voltage insulators was built at Stone in Staffordshire where production began in 1922. The company also made telephone styles for G.P.O., and many similar insulators were exported to other countries including Canada, Scotland, Ireland, Australia, New Zealand, Iran and Africa.

In 1959 Taylor, Tunnicliff & Co. merged with Bullers Ltd. (q.v.) to form the company known as Allied Insulators Ltd. (q.v.).

Two variations of the Taylor, Tunnicliff trademark are shown below.



ENGLAND -- Unattributed Markings

The unattributed SAUNDERS marking has been found on a very old insulator in England. The REID BROS. marking was found on a modern shackle insulator from England.

A
J. E. SAUNDERS & CO.

REID BROS.
LONDON

FINLAND -- Arabia Porcelain Company


Presently no information other than the facts that the factory is a large one located in Helsinki and manufactures porcelain insulators and other porcelain products. The writers have seen three styles of their insulators, but there are undoubtedly many more. A typical example of the "ARABIA" stamped on these specimens is shown below.

6HE3
ARABIA
264

FINLAND -- Oy Wärtsilä Ab Turku Pottery

Founded in 1918 at its present site in Turku, Finland. A good percentage of the production of the plant (200 employees) are insulators for low- and high-voltage pole lines, but the company also makes specialty porcelain items. It is unknown whether or not they export insulators. Two variations of the Turku Pottery trademark are shown below.



 HE 3
65

GERMANY -- AGROB Corporation

We have little historical information on this large company which is headquartered in Munich, Germany. They have seven plants for the manufacture of all forms of ceramic products and related items. Their Ehrang factory in Rhein manufactures a complete line of poleline insulators including pin types, and the following marking is used on the insulators.



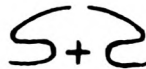
GERMANY -- Hunsrück Porzellanfabrick

This plant is located in Emmelhausen, just south of Hunsrück. They manufacture all forms of poleline insulators including pin types, and the following trademark is used on their insulators.



GERMANY -- Kronacher Porzellanfabrick

Presently no historical information is available on this company, which is an operating division of Stockhardt and Schmidt-Eckert. Their factory is located in Bayern (Bavaria), and they manufacture a complete line of poleline insulators including pin types. One interesting feature of one line of their high voltage pin types (see U-2312) is a uniquely shaped top groove to accommodate a type of preformed tie wire. Specimens of their insulators bear the Kronacher trademark shown below.



GERMANY -- Rhein-Westfalische Isolatoren Werke

This factory is located in Siegburg and began production of porcelain insulators in 1949, making a complete line of poleline insulators including pin types. The marking used is shown below.



GERMANY -- Rosenthal-Stemag-Technische Keramik

Rosenthal-Stemag was created in 1971 by the merger of three separate divisions -- Steatit Magnesia (Monogram-SM marking below), Rosenthal Technische Werke (RTW marking below) and Rosenthal Insulators. Rosenthal Insulators is the division which manufactures the pin types, including a line of typical European styles plus other export styles made to British standards for styles which screw directly onto threaded pins instead of being cemented onto spindles.

Rosenthal is one of the world's largest ceramics manufacturers and is a subsidiary of Rosenthal Corporation. They manufacture a wide line of industrial ceramic items including a large line of electrical insulators including pin types. Several markings we have attributed to the company are shown below.



GERMANY -- Unattributed Markings

Presently we have no information regarding the following markings found on insulators used in Germany.



M

AMK

GREECE --

No information other than markings found on several specimens of one insulator style (U-1267) found in Greece. Since the country is not well equipped for industrialization, it is likely these insulators were not manufactured there but were imported from another country.

There are two or more marking variations, each containing the "OTE" letters standing for Organization of Telephones of Ellas (the modern word for Greece), the national Greek telephone company for which the insulators were made. The associated markings are unattributed, but we believe they identify the manufacturers.



OTE



HUNGARY -- Zsolnay Ceramics

Founded in 1871 by Michael Zsolnay in the city of Pecs, the business has remained under family management through the years, even though it has grown to be the largest ceramics factory in Hungary. Aside from all its many other ceramic products, it also manufactures insulators, and we presently have only one specimen. This is a U-1280, an unusually heavy item of high quality porcelain with a fine white glaze. We do not know what other styles they may have made. The Zsolnay marking is shown below.



HUNGARY -- Unattributed Markings

The following marking was found on a low voltage power insulator (U-2279) attached to a building in Budapest.



ICELAND --

Two unattributed markings have been found on Icelandic insulators (the U-1811 and U-2027). Others found there bore only numbers.

GR
1906



39 M26
JS 28

IRAN --

It is doubtful that insulators were manufactured in Iran, and that those found there were imported. For possible identification of markings on specimens from there, see Bulgaria, England and Japan.

IRELAND --

We have no information on the manufacture of porcelain insulators in Ireland, and the specimens found there are almost identical with those manufactured and used in England. The Taylor, Tunnicliff marking appears on many of the communications insulators, but some bear only the markings of the users: GPO (General Post Office); P.O. (Post Office); P & T (Post & Telegraph). These various markings are shown below. The one with the numeral "3" is unattributed.

GPO



G.P.O.

P.O.

P. & T.

卐 3

ITALY -- I.M.E.C. (Industria Milanese Elettro Ceramica)

We presently have no historical information on this small factory located in Milan. The company's catalog shows a complete line of electrical insulators including pin types. Their insulators are usually marked simply with the company initials as shown below.

IMEC

ITALY -- Richard Ginori

This company is headquartered in Milan and is one of the most modern factories in Europe. It manufactures porcelain dinnerware and decorative items in addition to a complete line of electrical insulators. The plant has a large high-voltage laboratory for advanced research.

The company has put much effort into the development of insulators suitable for contaminated environments, and since the plant is located in the vicinity of both a cement and chemical plant, it is ideally situated in a polluted environment for the tests they conduct with experimental insulators! The Richard Ginori catalogs offer modern low- and high-voltage insulators, and their fog types correspond closely with the American designs. The company's trademark as shown below is used on insulators.



ITALY -- Verbano Ceramics

This company is located in Verbano, a town well known for ceramics, and its catalog shows a complete line of low- and high-voltage insulators including pin types. The marking they use on insulators is shown below.



JAPAN -- NGK Insulators Ltd.

NGK's first factory was established in 1919 in Mizuho, Nagoya, Japan. The largest plant and main office still remain there, but since then three other NGK factories have been put into operation -- the Atsuta in Nagoya and the Chita and Komaki factories in Aichi. The company has sales offices in India, Germany and the U.S.A., with sales agents in all its other major territories. Their insulators are presently in service in over 80 countries, including the United States and Canada.

NGK manufactures a complete line of porcelain insulators and pole-line hardware. The pin type insulators are offered in either European or American standards. Three markings found on NGK insulators are shown below.



JAPAN -- OTK (Osaka Togyo Kaisha Ltd.)

This plant is located in Osaka and was founded in 1920. The company originally produced primarily suspension insulators, but they now manufacture a diversified line of insulators. They export to more than 20 countries, and some of their pin types are available according to British, Australian or American standards. It is suspected that many of the smaller unmarked pin type insulators found in Australia are those of OTK. The marking used on OTK insulators is shown below.



JAPAN -- Unattributed Markings

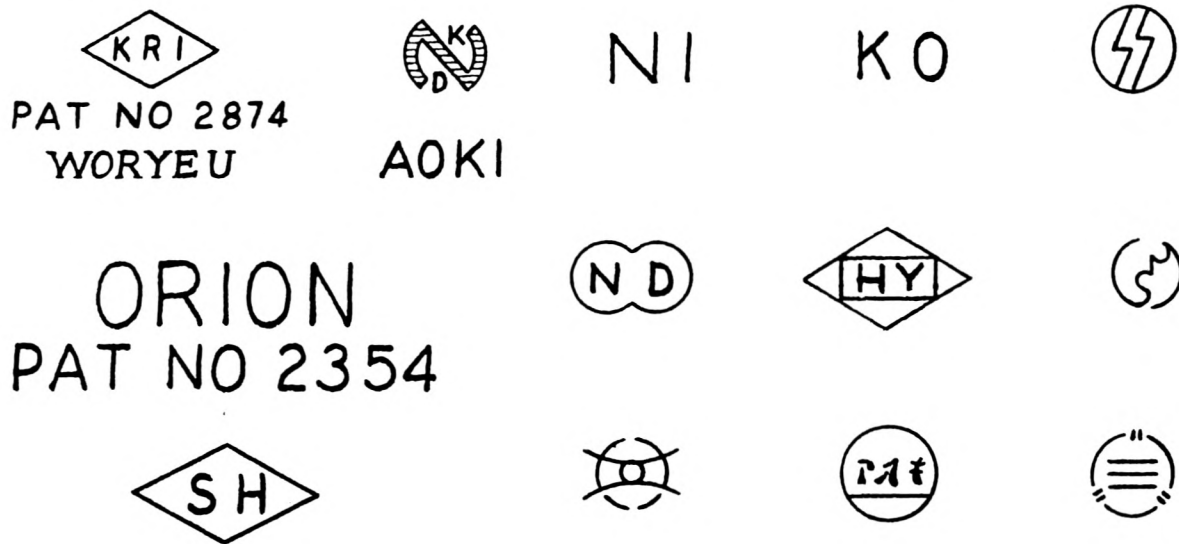
All the markings shown below have either been found in Japan or are identified as having been made there by the "Made in Japan" notation in the markings. The HESCHO marking indicates Japanese manufacture for export to Canada.



HESCHO

KOREA --

All the markings below have been found on Korean insulators. None of these markings have been attributed to any manufacturers.



LUXEMBOURG --

No information, although the appendix table shows specific styles which have been found in Luxembourg.

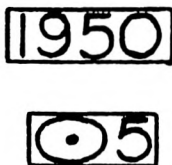
NEW ZEALAND -- NZI (New Zealand Insulators)

NZI has plants in Temuka and Ashburton, both within the district of Canterbury, South Island. From a small factory begun in the early 1890's the company has grown to be a leader in the New Zealand ceramics industry. They manufacture a diversified line of porcelain insulators to either New Zealand or British standards. The markings used on their insulators are shown below.



NORWAY --

Thus far, the only marking we have recorded for Norway is shown below. Evidently many of Norway's insulators are unmarked.



PAKISTAN --

Pakistan probably does not have an insulator manufacturer but relies on imports. Unattributed Japanese and Bulgarian markings have been found on communications insulators but always accompanied by user markings as shown below. The "PAK T & T" stands for Pakistan Telephone & Telegraph, and the "PAK P & T" stands for Pakistan Post & Telegraph.

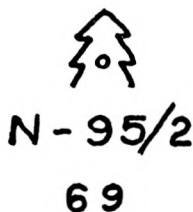
MADE IN
BULGARIA
PAK T. & T.

PAK P & T
LA CLAIRE

1962
MADE IN JAPAN

POLAND --

We have no information on Polish insulator manufacturers, but markings on specimens from Poland are shown below. The pine tree is probably a manufacturer's trademark. The ITP stands for "izolatory telefoniczne porcelana" (porcelain telephone insulator), and the "1" in that marking is for the insulator size (smaller sizes of the same type being marked 2 and 3). The markings with "N-95/2" and "VHD 15" were found on high voltage insulators.



PORTUGAL --

Two markings, both unattributed, found on insulators from Portugal are shown below.

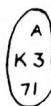
V.A.
PORTUGAL



RUSSIA --

We have no information on Russian insulator manufacturers. The four markings shown below were found on insulator specimens from Russia.


6304





1960

SCOTLAND --

Communications insulators used in Scotland are identical to the ones manufactured and used in England.

SOUTH AFRICA -- Cullinan Industrial Porcelain Ltd.

Electric Line Components Pty. Ltd. (ELC), established in 1967 and headquartered in Johannesburg, is responsible for the development, design and marketing of three South African divisions who manufacture glass and porcelain electrical components as a service to electrical transmission and distribution authorities in southern Africa. These divisions are Cullinan Industrial Porcelain Ltd., SAG Ceramics Ltd., and Glass Insulators Ltd.

The Cullinan operation originated in 1902 as the Consolidated Rand Brick, Pottery and Lime Company, located in Olifantsfontein, Transvaal, South Africa. Douglas Major Cullinan came to the company in 1951 as a trainee and had progressed to the position of plant supervisor by 1955. During these years the company had expanded production to include low and high voltage insulators, and a high voltage test laboratory was built in 1955, the same year in which the company changed its name to Cullinan Refractories Ltd.

In 1971, when the company again changed its name to Cullinan Holdings Ltd., Mr. Cullinan and his brother were co-directors of the Cullinan group. With the company's continued research and expansion, a decision was made to build a completely new industrial porcelain factory. Before the plant was completed in 1975, D. M. Cullinan suddenly died, and the plant was named in his memory.

Specimens of Cullinan insulators are difficult to obtain, since they are found in a relatively limited region. Presently we have only catalog information on their products. It is probable that the marking used on insulators is a derivative of the company logo shown below.



SOUTH AFRICA -- SAG Ceramics Ltd.

No information.

SPAIN -- Manufacturas Ceramicas S.A.

We have no information on this company other than it being located in Barcelona, Spain.

The company's insulators are marked with their trademark (shown at the left below), or a C/T marking (at right below), or a combination of the two markings. Their U-2954 style has been located with only a paper label bearing the trademark and the company name, and this might explain why numerous porcelain insulators found in Spain are apparently unmarked, the paper labels naturally lacking permanence.



SWEDEN --

Shown below are three different markings we have found on specimens of Swedish insulators. All of these markings are unattributed.

IF O 49



A.T.B.

Nº 2

SWITZERLAND --

Shown below are four different markings we have found on specimens of Swiss insulators. We have no information on the manufacturer.



TAIWAN -- LTL Manufacturing Corporation

This company is located in Taipei, Taiwan. We have no information on it other than their catalog showing a complete line of transmission and distribution insulators. They indicate that they export items, some being available to Australian and American standards.

We have seen no specimens of their insulators, but markings on them could be derivatives of the company logos shown below.



VIETNAM
(Unattrib.)

UNITED STATES OF AMERICA --

A very complete and comprehensive treatment of United States pintype insulators is given in the book "Porcelain Insulators Guide Book for Collectors" (see bibliography), and this book lists in its bibliography most of the other better books on United States insulators.

A number of U.S. companies made insulators for export, both regular U.S. styles and duplications of some established "European" styles. Some of these U.S. styles found in various countries are unmarked, but others may be readily attributed to manufacturer by their markings. Companies known to have exported, mainly to Canada, are as follows:

- Imperial Porcelain Works, Trenton, NJ (exports 1897-1902)
- Locke Insulators, Inc., Victor, NY
- New Lexington High Voltage Porcelain Co., New Lexington, OH
- Ohio Brass Company, Mansfield, OH
- Pittsburg High Voltage Insulator Co., Derry, PA
- R. Thomas & Sons Company, East Liverpool, OH

VIETNAM --

Due to the strong French influence in this country for a period of years, many of the glass insulators used there were imported from France. A few unmarked porcelain insulators have been found in Vietnam which are close copies of the French glass insulator designs, but they are crudely made, and we feel they were probably manufactured locally. The appendix table indicates several styles of pin types as being found in Vietnam.

YUGOSLAVIA --

The unattributed marking shown below has been found in Yugoslavia, and it may or may not have been manufactured in that country. The "P T T" stands for "Post, Telegraph and Telephone".



PTT

MISCELLANEOUS UNATTRIBUTED MARKINGS --

All the following markings have been found on various specimens unidentified as to country of origin.

KORAN

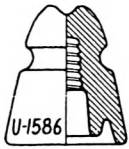


1929

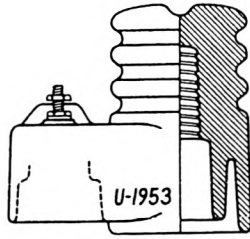
FOWLER
19 JUN 1969



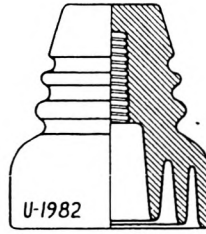
Laura Van Der Endt of New South Wales, Australia has one of the very largest worldwide insulator collections. Just hours before this book was scheduled to be plated, she passed through Phoenix on a visitation to the U.S.A. We held up printing of the book one day in order that we could draw up the "new" items she had with her, and these are shown below on a too-late-to-classify basis.



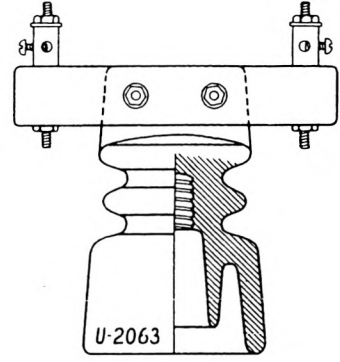
U-1586
 $2\frac{3}{8} \times 2\frac{3}{4}$



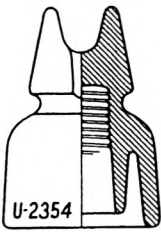
U-1953
 $2\frac{3}{4} \times 4\frac{3}{8}$



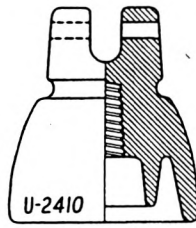
U-1982
 $3\frac{3}{4} \times 4\frac{3}{8}$



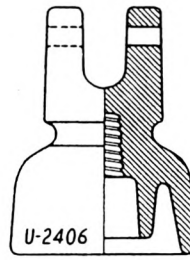
U-2063
 $3\frac{1}{2} \times 5\frac{1}{2}$



U-2354
 $3 \times 4\frac{1}{4}$



U-2410
 $3\frac{5}{8} \times 4\frac{1}{8}$



U-2406
 $3\frac{1}{2} \times 4\frac{3}{4}$



U-2510
 $3\frac{1}{8} \times 3\frac{1}{8}$

UNIVERSAL STYLE CHART

The drawings on the following pages are an extension of the Universal Style Chart of U.S. insulators in the book "Porcelain Insulators Guide Book for Collectors" (see bibliography). The drawings are made uniformly $\frac{1}{4}$ -size. A number of the more common styles were made by more than one manufacturer, but a definitive description of any specimen is obtained by listing the U- number, glaze color and marking (if any).

A majority of the drawings were made from actual specimens and are very accurate in all respects. Others were made from various manufacturer catalog sheets and vary as to accuracy of fine detail. Do not expect every specimen to exactly fit the drawing detail or exact size stated.

There is no end to minor variations in porcelain insulators because of design evolution, different manufacturers of the same basic design and normal factory tolerances. In preparing material for this book, we made numerous drawings of insulators which we later just left out of the chart because they were so similar to ones finally included. We did include some very similar styles in instances where the specific differences will allow attribution of unmarked specimens to different countries. In cases where a specimen differs substantially from the closest style shown, you can list it as "Sim U-xxxx, larger top groove" for instance.

Except for several telephone styles and early classics, the chart is limited to "unipart" pin types, which we arbitrarily define as insulators fired all in one piece -- namely, excluding designs with more than one part cemented together. It would quadruple the work involved and size of the chart to include multipart styles and all for no good purpose, since collectors or museums would seldom have need for cataloging reference numbers on those large items seldom obtained.

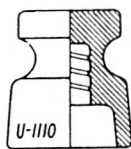
A number of the larger unipart power insulators are cataloged in a series of ever-increasing sizes, all generally identical in shape, allowing for higher voltage ratings. We have usually drawn just the smallest size of these. If you have a larger one of the same style, just list it as "Sim U-xxxx" and state the overall size. Telephone styles are charted in all known sizes of a series, since they are much more likely available for cataloging in collections.

Any insulator is usually readily attributable to manufacturer and/or country if it bears a legible marking of known character. To facilitate attribution of many unmarked specimens, we have given in the appendixes a table of all styles (U- numbers) listing known manufacturers or countries for each style. The lefthand pages in this table have been purposely left blank for notations on specimens.

In tracking down information for this book, it makes sense to gather what comes easiest, then publish that as a starting point. Then anything not included in the publication can be considered "new" and needed information. We would like to hear from any collectors who have styles other than those in this style chart, who know of or can attribute any markings not included, or who have catalogs of any manufacturer or jobber showing styles we haven't shown. We can make drawings of specimens in nearly all cases by shadow profile and measured dimensions without having to see the insulator itself. The method for doing this is described in the appendix.



$$2\frac{1}{8} \times 2\frac{5}{8}$$



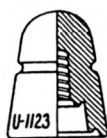
$$2\frac{1}{2} \times 2\frac{7}{8}$$



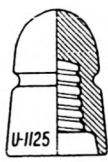
$$2\frac{1}{4} \times 3\frac{1}{4}$$



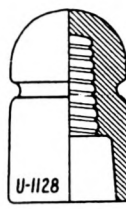
$$3 \times 3\frac{1}{2}$$



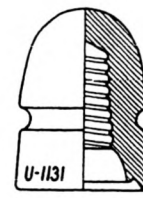
$$2\frac{1}{8} \times 2\frac{5}{8}$$



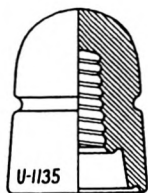
$$2\frac{1}{8} \times 3$$



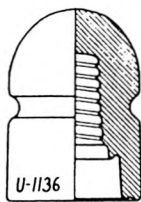
$$2\frac{1}{2} \times 4$$



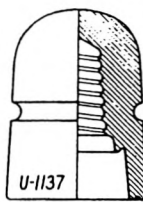
$$2\frac{3}{4} \times 3\frac{3}{4}$$



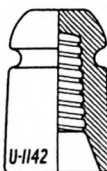
$$2\frac{7}{8} \times 3\frac{7}{8}$$



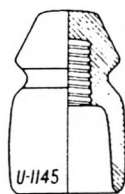
$$2\frac{7}{8} \times 4\frac{1}{8}$$



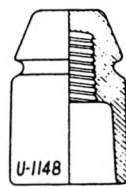
$$2\frac{3}{4} \times 4\frac{1}{8}$$



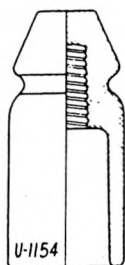
$$2\frac{1}{4} \times 3\frac{3}{8}$$



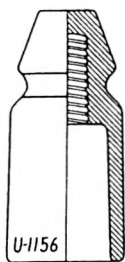
$$2\frac{1}{4} \times 3\frac{7}{8}$$



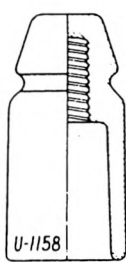
$$2\frac{1}{2} \times 3\frac{5}{8}$$



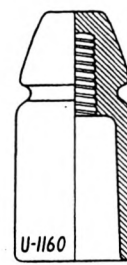
$$2\frac{3}{8} \times 5\frac{3}{8}$$



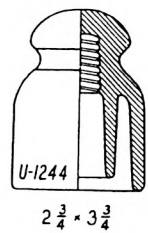
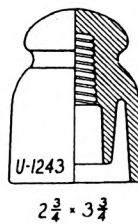
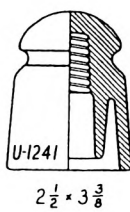
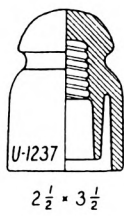
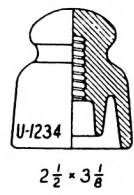
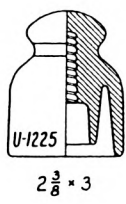
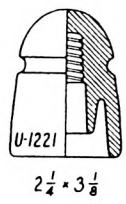
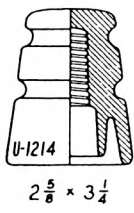
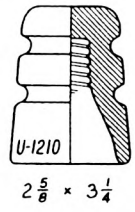
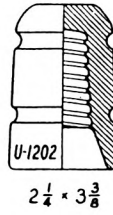
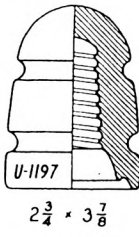
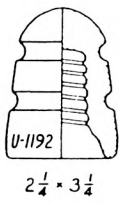
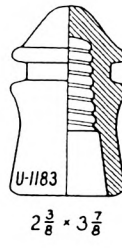
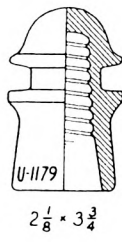
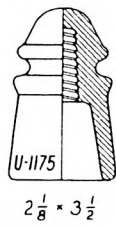
$$2\frac{3}{8} \times 5\frac{1}{4}$$

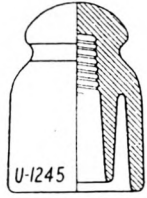


$$2\frac{3}{8} \times 5\frac{1}{8}$$

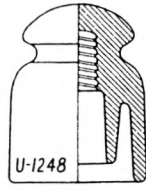


$$2\frac{3}{8} \times 5\frac{1}{4}$$





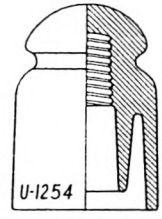
$$2\frac{3}{4} \times 4$$



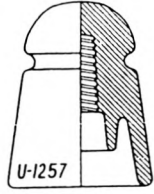
$$2\frac{7}{8} \times 3\frac{3}{4}$$



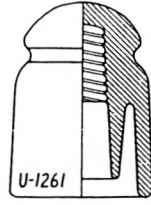
$$2\frac{7}{8} \times 3\frac{3}{4}$$



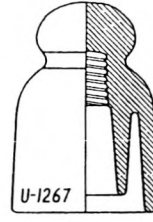
$$2\frac{7}{8} \times 4\frac{1}{4}$$



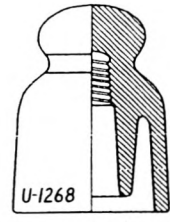
$$3 \times 3\frac{7}{8}$$



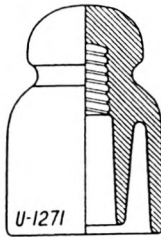
$$3 \times 4\frac{1}{8}$$



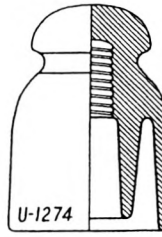
$$3 \times 4\frac{1}{2}$$



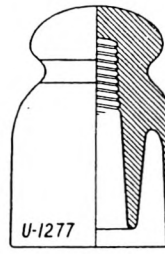
$$3\frac{1}{8} \times 4\frac{3}{8}$$



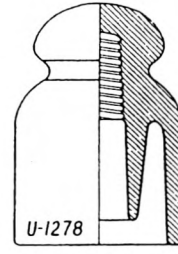
$$3\frac{1}{4} \times 4\frac{7}{8}$$



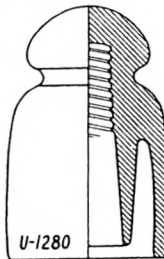
$$3\frac{3}{8} \times 4\frac{3}{4}$$



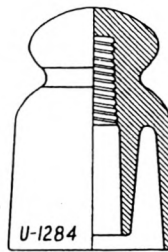
$$3\frac{1}{2} \times 5\frac{1}{8}$$



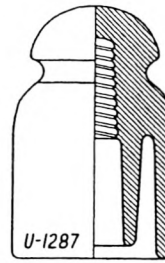
$$3\frac{3}{8} \times 5\frac{1}{8}$$



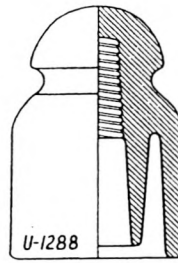
$$3\frac{3}{8} \times 5\frac{3}{8}$$



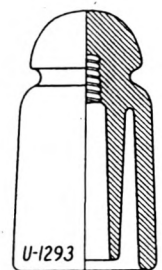
$$3\frac{1}{2} \times 5\frac{1}{8}$$



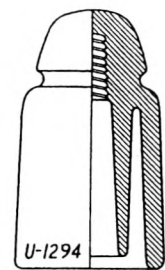
$$3\frac{1}{4} \times 5\frac{1}{4}$$



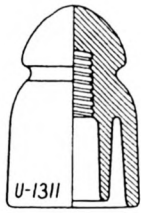
$$3\frac{1}{2} \times 5\frac{3}{8}$$



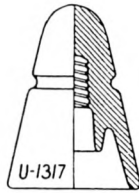
$$2\frac{7}{8} \times 5\frac{1}{2}$$



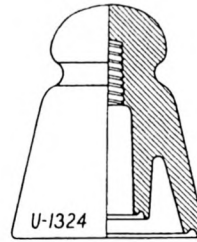
$$3 \times 5\frac{3}{8}$$



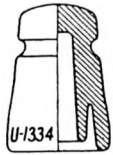
$2\frac{5}{8} \times 4$



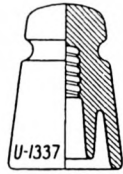
$2\frac{3}{4} \times 3\frac{3}{4}$



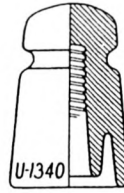
$4 \times 4\frac{3}{4}$



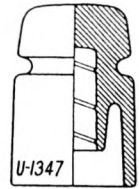
$2\frac{1}{8} \times 3\frac{1}{8}$



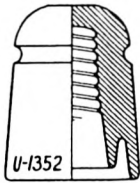
$2\frac{3}{8} \times 3\frac{1}{2}$



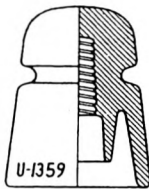
$2\frac{1}{2} \times 3\frac{7}{8}$



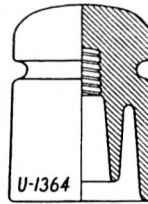
$2\frac{5}{8} \times 3\frac{7}{8}$



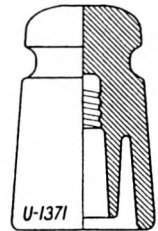
$2\frac{3}{4} \times 3\frac{7}{8}$



$3 \times 3\frac{3}{4}$



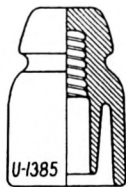
$3 \times 4\frac{1}{8}$



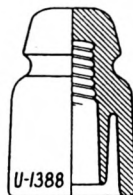
$3 \times 4\frac{3}{4}$



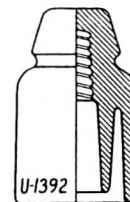
$2\frac{3}{8} \times 3\frac{1}{4}$



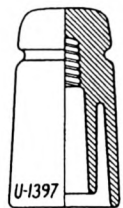
$2\frac{3}{8} \times 3\frac{7}{8}$



$2\frac{1}{2} \times 4$



$2\frac{3}{8} \times 4\frac{1}{8}$



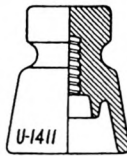
$2\frac{3}{8} \times 4\frac{1}{4}$



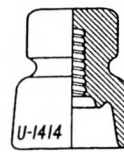
$2\frac{1}{8} \times 2$



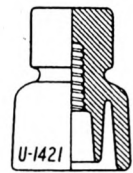
$2\frac{1}{2} \times 3$



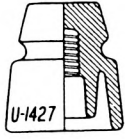
$2\frac{5}{8} \times 3\frac{1}{8}$



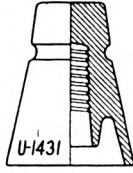
$2\frac{1}{2} \times 3$



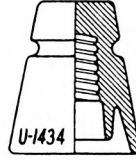
$2\frac{1}{2} \times 3\frac{3}{8}$



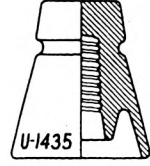
$$2\frac{3}{8} \times 2\frac{5}{8}$$



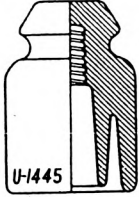
$$2\frac{5}{8} \times 3\frac{1}{4}$$



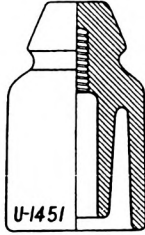
$$2\frac{3}{4} \times 3\frac{1}{8}$$



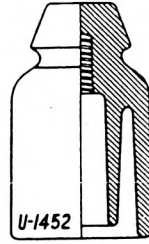
$$2\frac{7}{8} \times 3\frac{1}{4}$$



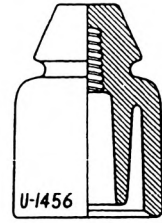
$$2\frac{3}{4} \times 4$$



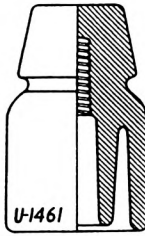
$$2\frac{7}{8} \times 4\frac{3}{4}$$



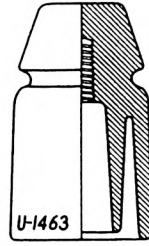
$$2\frac{7}{8} \times 4\frac{7}{8}$$



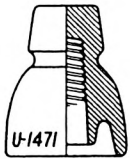
$$3 \times 4\frac{1}{2}$$



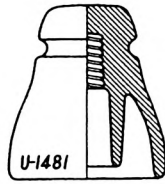
$$3 \times 4\frac{3}{4}$$



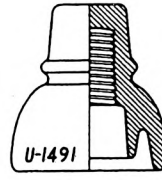
$$3 \times 5$$



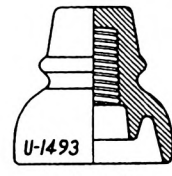
$$2\frac{1}{2} \times 3\frac{1}{8}$$



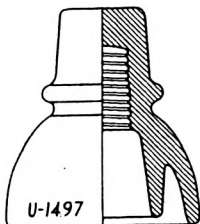
$$3\frac{1}{4} \times 3\frac{5}{8}$$



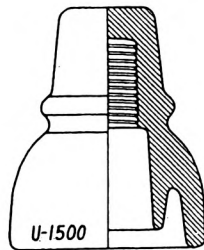
$$3\frac{1}{8} \times 3\frac{1}{2}$$



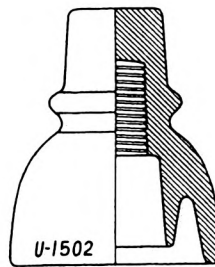
$$3\frac{1}{4} \times 3\frac{1}{4}$$



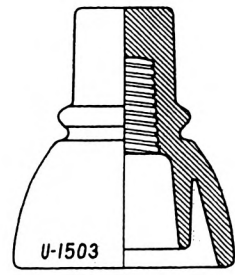
$$4 \times 4\frac{1}{2}$$



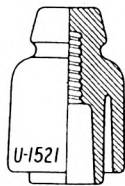
$$4 \times 5$$



$$4\frac{1}{4} \times 5\frac{1}{4}$$



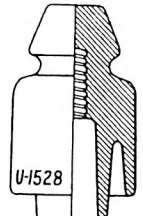
$$4\frac{1}{2} \times 5\frac{1}{4}$$



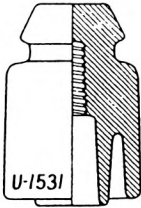
$$2\frac{3}{8} \times 3\frac{1}{2}$$



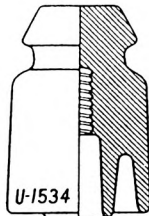
$$2\frac{1}{4} \times 4$$



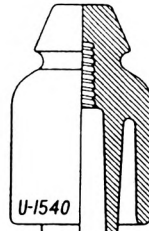
$$2\frac{5}{8} \times 4\frac{3}{8}$$



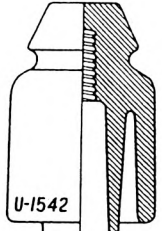
$$2\frac{3}{4} \times 4\frac{1}{8}$$



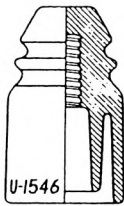
$$3 \times 4\frac{3}{8}$$



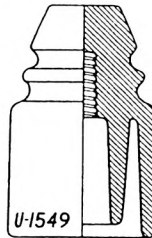
$$2\frac{7}{8} \times 4\frac{7}{8}$$



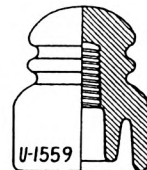
$$3 \times 4\frac{7}{8}$$



$$2\frac{3}{8} \times 4$$



$$3 \times 4\frac{7}{8}$$



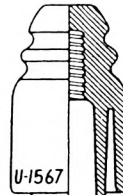
$$2\frac{3}{4} \times 3\frac{3}{8}$$



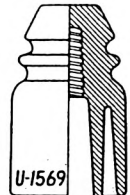
$$2\frac{5}{8} \times 3\frac{3}{8}$$



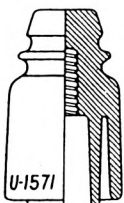
$$2\frac{1}{2} \times 4$$



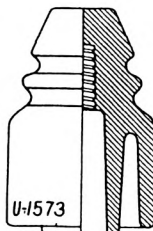
$$2\frac{3}{8} \times 4\frac{1}{8}$$



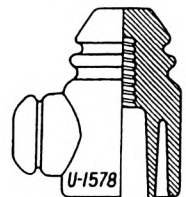
$$2\frac{3}{8} \times 4\frac{1}{8}$$



$$2\frac{1}{2} \times 4\frac{1}{8}$$



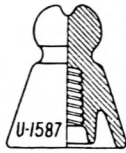
$$3 \times 4\frac{3}{4}$$



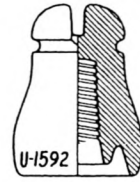
$$2\frac{1}{2} \times 4\frac{1}{8}$$



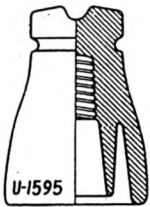
$2 \times 2\frac{3}{8}$



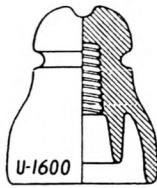
$2\frac{1}{2} \times 2\frac{7}{8}$



$2\frac{1}{2} \times 3\frac{1}{2}$



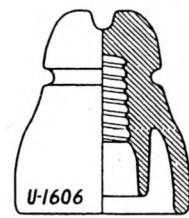
3×4



$3\frac{1}{8} \times 3\frac{5}{8}$



$3\frac{1}{4} \times 4\frac{1}{4}$



$3\frac{1}{2} \times 4\frac{1}{4}$



$1\frac{1}{2} \times 2\frac{1}{4}$



$1\frac{3}{4} \times 2\frac{1}{4}$



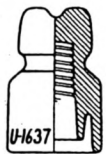
$1\frac{7}{8} \times 2\frac{1}{4}$



$1\frac{7}{8} \times 2\frac{3}{4}$



$2 \times 2\frac{3}{4}$



2×3



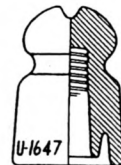
$2\frac{1}{8} \times 2\frac{5}{8}$



$2\frac{1}{8} \times 2\frac{3}{4}$



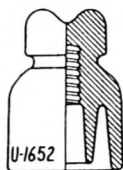
$2\frac{1}{4} \times 2\frac{1}{2}$



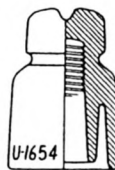
$2\frac{1}{4} \times 3\frac{1}{4}$



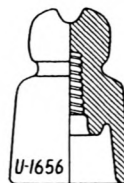
$2\frac{3}{8} \times 3$



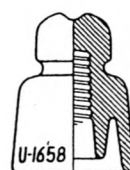
$2\frac{3}{8} \times 3\frac{1}{4}$



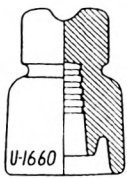
$2\frac{3}{8} \times 3\frac{1}{4}$



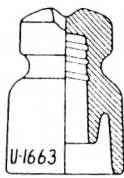
$2\frac{3}{8} \times 3\frac{5}{8}$



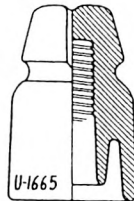
$2\frac{1}{2} \times 3\frac{1}{4}$



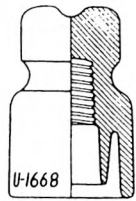
$$2\frac{1}{2} \times 3\frac{3}{8}$$



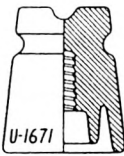
$$2\frac{1}{2} \times 3\frac{3}{8}$$



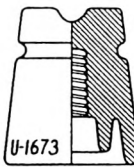
$$2\frac{5}{8} \times 3\frac{7}{8}$$



$$2\frac{5}{8} \times 3\frac{7}{8}$$



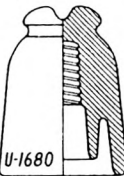
$$2\frac{5}{8} \times 3$$



$$2\frac{7}{8} \times 3\frac{1}{4}$$



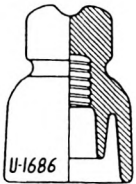
$$2\frac{3}{4} \times 3\frac{1}{2}$$



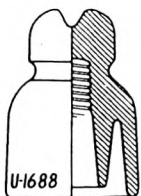
$$2\frac{3}{4} \times 3\frac{1}{2}$$



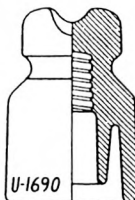
$$2\frac{3}{4} \times 3\frac{1}{2}$$



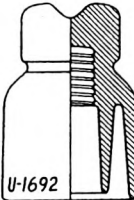
$$2\frac{3}{4} \times 3\frac{3}{4}$$



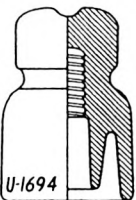
$$2\frac{3}{4} \times 4$$



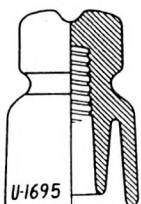
$$2\frac{3}{4} \times 4$$



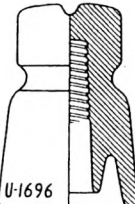
$$2\frac{3}{4} \times 4\frac{1}{8}$$



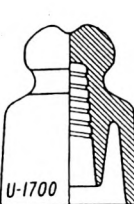
$$2\frac{3}{4} \times 4$$



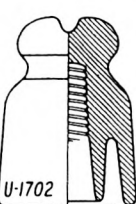
$$2\frac{3}{4} \times 4\frac{1}{8}$$



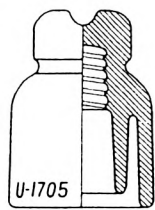
$$2\frac{7}{8} \times 4\frac{1}{4}$$



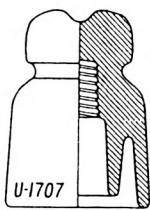
$$2\frac{7}{8} \times 3\frac{3}{4}$$



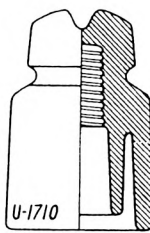
$$3 \times 4$$



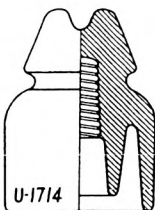
3 × 4



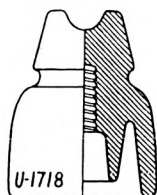
3 × 4



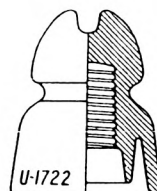
3 × 4 $\frac{3}{8}$



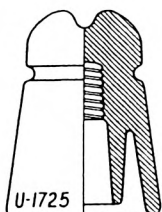
3 × 4 $\frac{1}{8}$



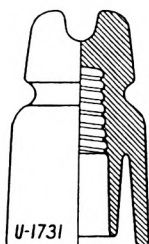
3 $\frac{1}{8}$ × 3 $\frac{7}{8}$



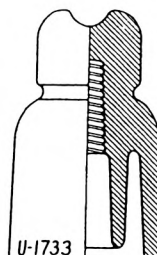
3 $\frac{1}{8}$ × 3 $\frac{7}{8}$



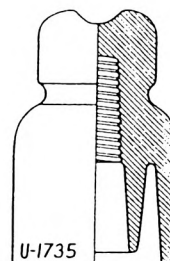
3 $\frac{1}{8}$ × 4 $\frac{1}{4}$



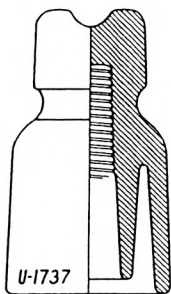
3 × 5



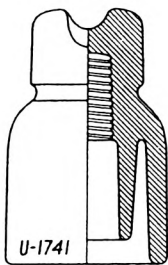
3 $\frac{1}{8}$ × 5 $\frac{1}{4}$



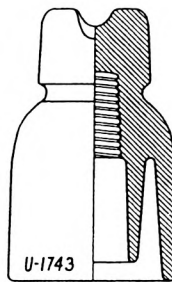
3 $\frac{1}{4}$ × 5 $\frac{3}{8}$



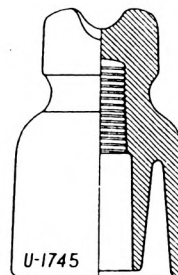
3 $\frac{3}{8}$ × 6



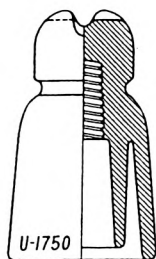
3 $\frac{3}{8}$ × 5 $\frac{3}{8}$



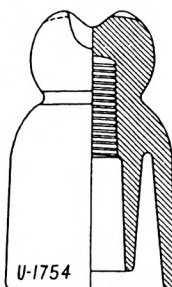
3 $\frac{1}{2}$ × 5 $\frac{3}{4}$



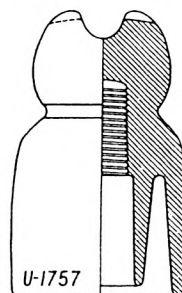
3 $\frac{1}{2}$ × 5 $\frac{5}{8}$



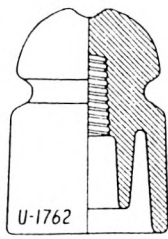
3 $\frac{1}{8}$ × 5 $\frac{1}{8}$



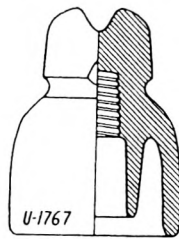
3 $\frac{1}{2}$ × 5 $\frac{3}{4}$



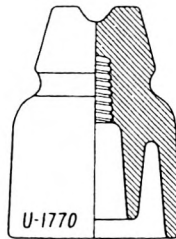
3 $\frac{1}{2}$ × 5 $\frac{7}{8}$



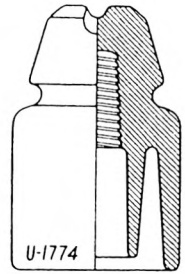
$$3\frac{3}{8} \times 4\frac{1}{2}$$



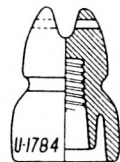
$$3\frac{3}{8} \times 4\frac{1}{2}$$



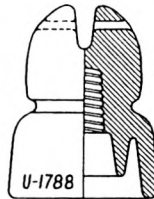
$$3\frac{1}{2} \times 4\frac{5}{8}$$



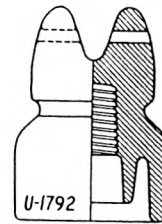
$$3\frac{1}{2} \times 5\frac{3}{8}$$



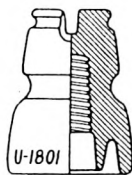
$$2\frac{1}{8} \times 3\frac{1}{8}$$



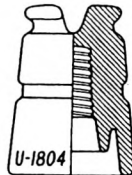
$$3 \times 4$$



$$3\frac{1}{8} \times 4\frac{3}{8}$$



$$2\frac{5}{8} \times 3\frac{1}{2}$$



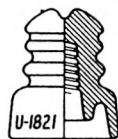
$$2\frac{5}{8} \times 3\frac{1}{2}$$



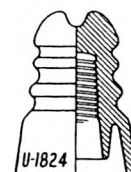
$$3\frac{3}{8} \times 4\frac{1}{4}$$



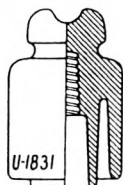
$$2 \times 2\frac{3}{8}$$



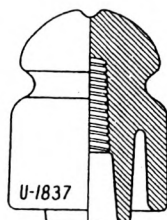
$$2\frac{1}{4} \times 2\frac{3}{4}$$



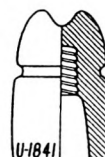
$$2\frac{1}{2} \times 3\frac{1}{2}$$



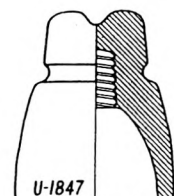
$$2\frac{3}{8} \times 3\frac{5}{8}$$



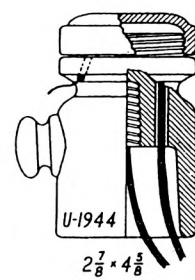
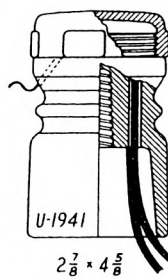
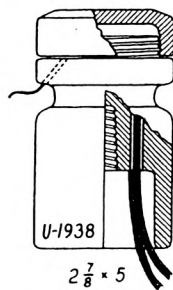
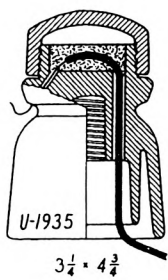
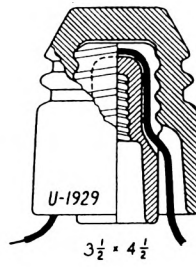
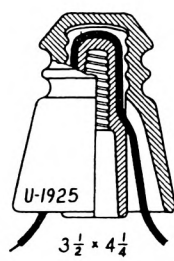
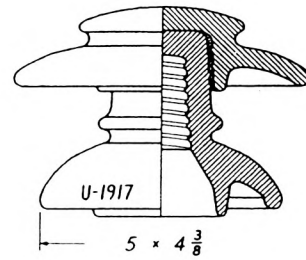
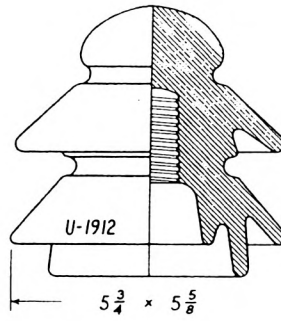
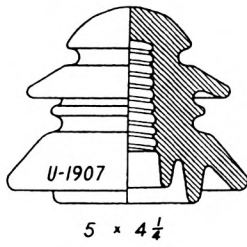
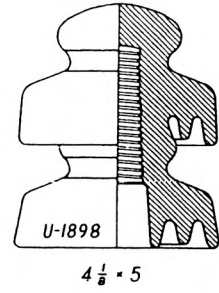
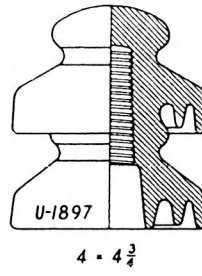
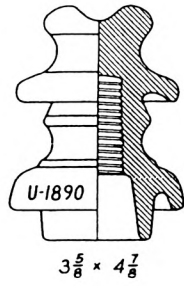
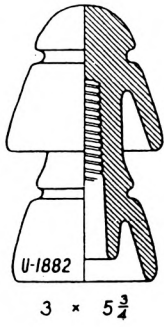
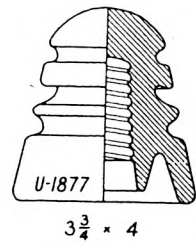
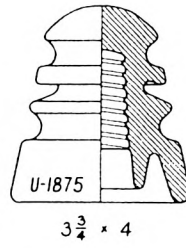
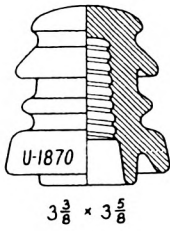
$$3\frac{1}{4} \times 4\frac{1}{2}$$

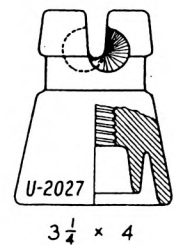
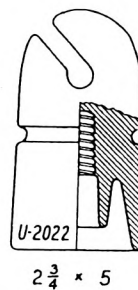
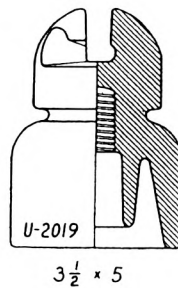
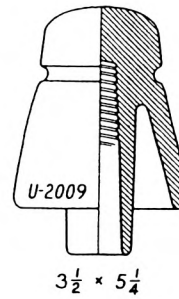
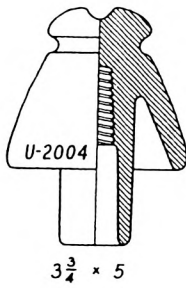
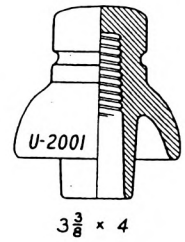
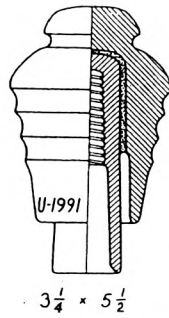
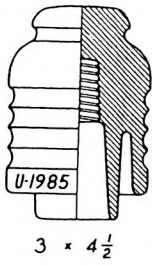
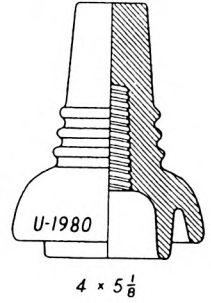
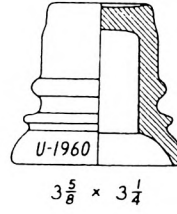
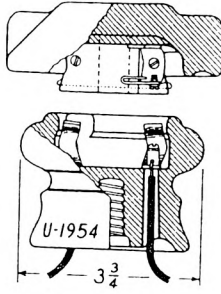
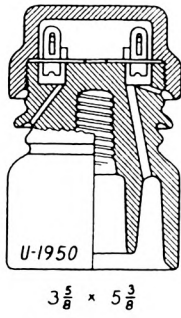


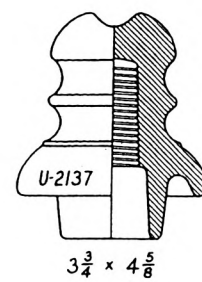
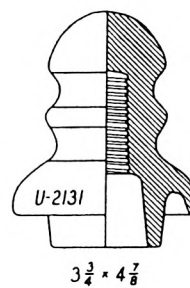
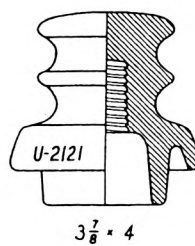
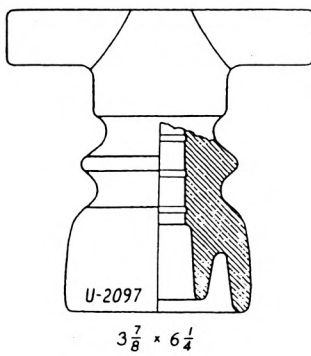
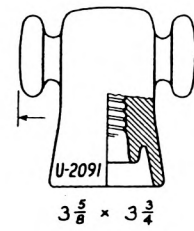
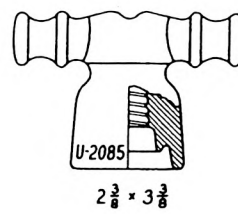
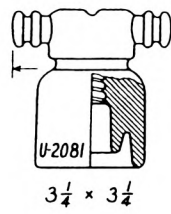
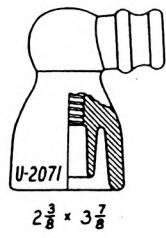
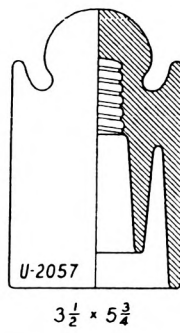
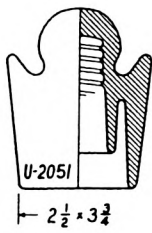
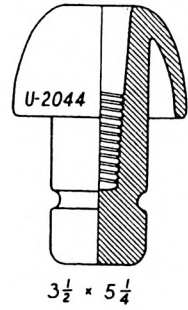
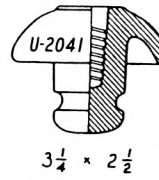
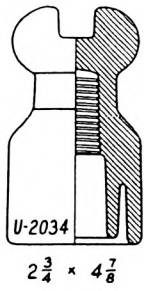
$$2 \times 3\frac{1}{4}$$



$$3\frac{1}{4} \times 4$$

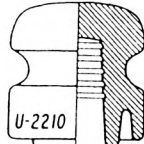




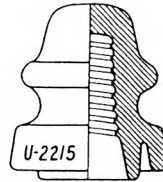




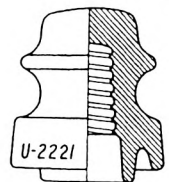
$$2\frac{3}{4} \times 2\frac{3}{4}$$



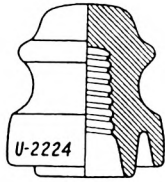
$$2\frac{3}{4} \times 2\frac{7}{8}$$



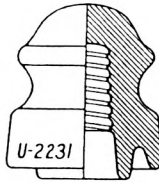
$$3\frac{1}{4} \times 3\frac{5}{8}$$



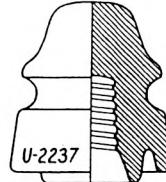
$$3\frac{1}{4} \times 3\frac{1}{2}$$



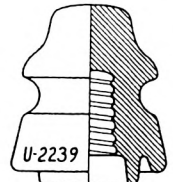
$$3\frac{1}{4} \times 3\frac{5}{8}$$



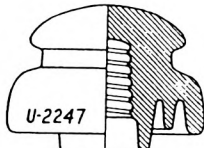
$$3\frac{1}{4} \times 3\frac{5}{8}$$



$$3\frac{1}{4} \times 3\frac{3}{4}$$



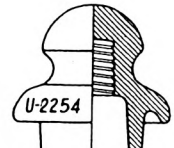
$$3\frac{1}{4} \times 3\frac{3}{4}$$



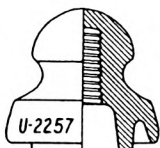
$$4 \times 3$$



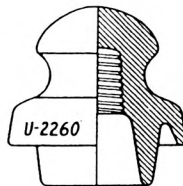
$$2\frac{3}{8} \times 2\frac{3}{8}$$



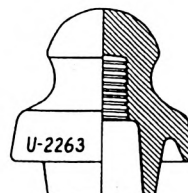
$$3\frac{1}{4} \times 3\frac{3}{8}$$



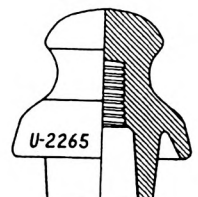
$$3\frac{1}{4} \times 3\frac{1}{2}$$



$$3\frac{3}{4} \times 3\frac{3}{4}$$



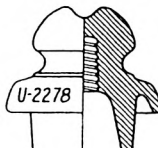
$$3\frac{3}{4} \times 4$$



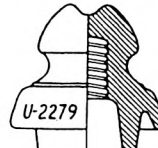
$$3\frac{3}{4} \times 4\frac{1}{8}$$



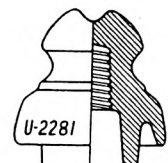
$$2\frac{3}{4} \times 3$$



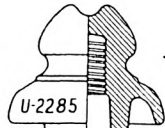
$$3\frac{1}{8} \times 3\frac{1}{8}$$



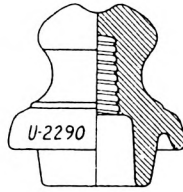
$$3\frac{1}{8} \times 3\frac{3}{8}$$



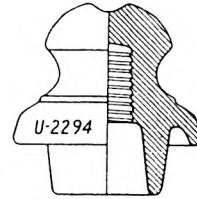
$$3\frac{1}{8} \times 3\frac{5}{8}$$



$$3\frac{1}{4} \times 3\frac{3}{8}$$



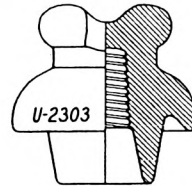
$$3\frac{5}{8} \times 3\frac{3}{4}$$



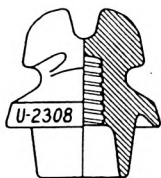
$$3\frac{7}{8} \times 3\frac{7}{8}$$



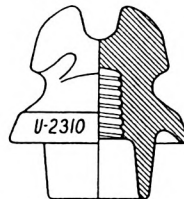
$$3\frac{1}{8} \times 3\frac{1}{4}$$



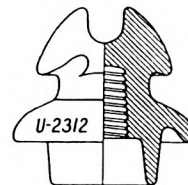
$$3\frac{3}{4} \times 3\frac{3}{4}$$



$$3\frac{1}{4} \times 3\frac{1}{2}$$



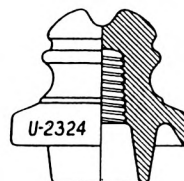
$$3\frac{3}{4} \times 4$$



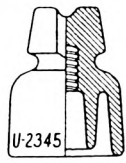
$$3\frac{3}{4} \times 3\frac{3}{4}$$



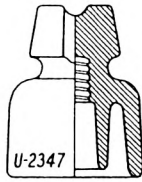
$$3\frac{1}{8} \times 3\frac{3}{8}$$



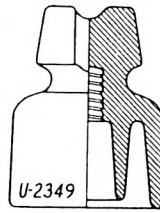
$$3\frac{3}{4} \times 3\frac{3}{4}$$



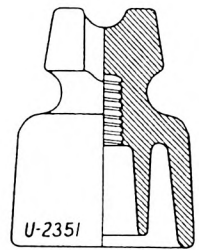
U-2345
 $2\frac{3}{8} \times 3$



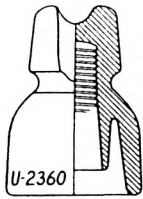
U-2347
 $2\frac{3}{4} \times 3\frac{1}{2}$



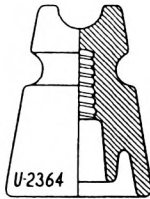
U-2349
 $3\frac{3}{8} \times 4$



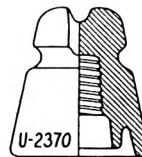
U-2351
 $3\frac{7}{8} \times 4$



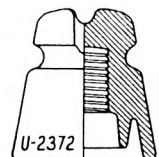
U-2360
 $2\frac{3}{4} \times 3\frac{7}{8}$



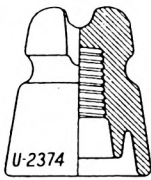
U-2364
 3×4



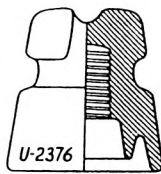
U-2370
 $2\frac{7}{8} \times 3\frac{1}{8}$



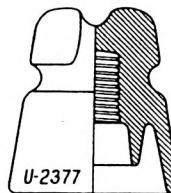
U-2372
 $3 \times 3\frac{1}{8}$



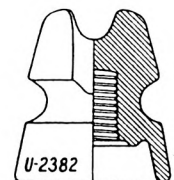
U-2374
 $3 \times 3\frac{1}{2}$



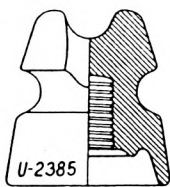
U-2376
 $3\frac{1}{4} \times 3\frac{1}{2}$



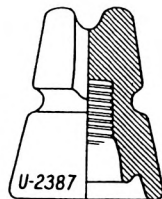
U-2377
 $3\frac{1}{2} \times 4$



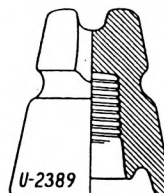
U-2382
 $3\frac{1}{4} \times 3\frac{5}{8}$



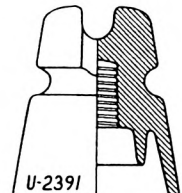
U-2385
 $3\frac{1}{2} \times 3\frac{5}{8}$



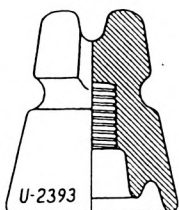
U-2387
 $3\frac{1}{4} \times 4$



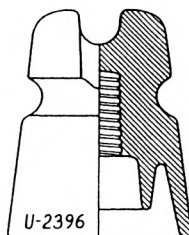
U-2389
 $3\frac{3}{8} \times 3\frac{7}{8}$



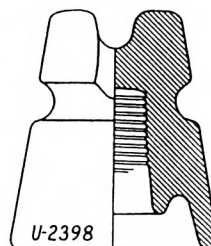
U-2391
 $3\frac{1}{2} \times 4$



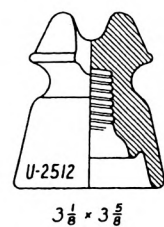
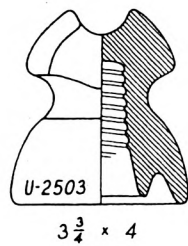
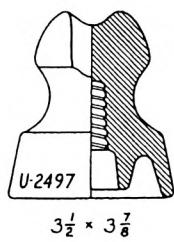
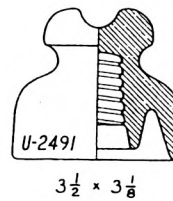
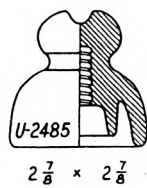
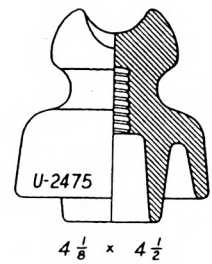
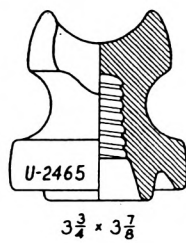
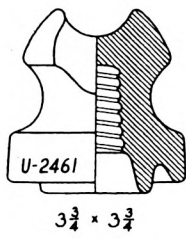
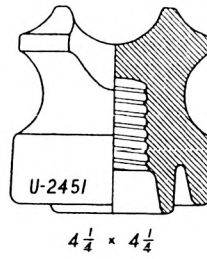
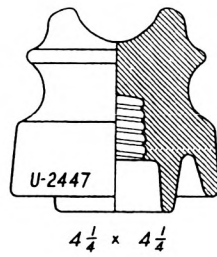
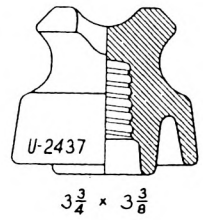
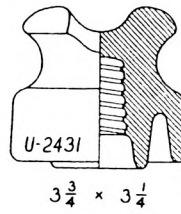
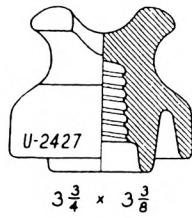
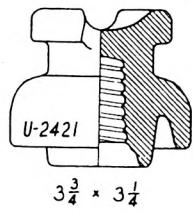
U-2393
 $3\frac{5}{8} \times 4\frac{1}{4}$

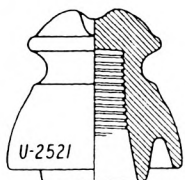


U-2396
 $3\frac{7}{8} \times 4\frac{3}{4}$



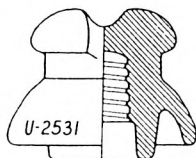
U-2398
 $4\frac{3}{8} \times 5$





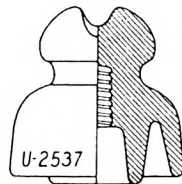
U-2521

$$3\frac{5}{8} \times 3\frac{1}{2}$$



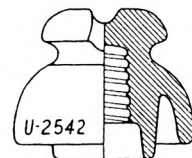
U-2531

$$3\frac{7}{8} \times 3$$



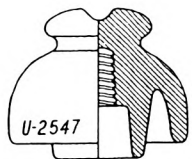
U-2537

$$3\frac{3}{4} \times 3\frac{1}{2}$$



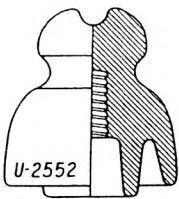
U-2542

$$3\frac{3}{4} \times 3$$



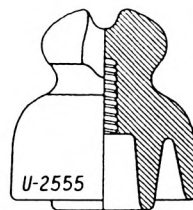
U-2547

$$3\frac{3}{4} \times 3\frac{1}{8}$$



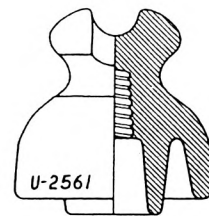
U-2552

$$3\frac{5}{8} \times 3\frac{7}{8}$$



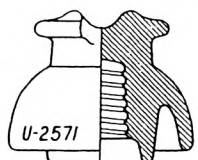
U-2555

$$4 \times 4\frac{1}{4}$$



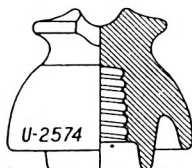
U-2561

$$4\frac{1}{8} \times 4\frac{1}{4}$$



U-2571

$$3\frac{3}{4} \times 3\frac{1}{8}$$



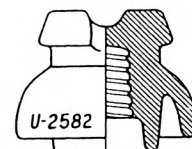
U-2574

$$3\frac{3}{4} \times 3\frac{3}{8}$$



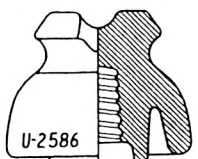
U-2578

$$3\frac{3}{4} \times 3\frac{1}{4}$$



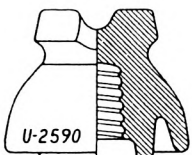
U-2582

$$3\frac{3}{4} \times 3$$



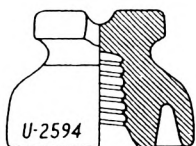
U-2586

$$3\frac{7}{8} \times 3\frac{1}{2}$$



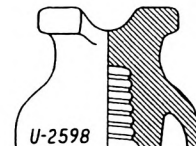
U-2590

$$3\frac{3}{4} \times 3\frac{1}{2}$$



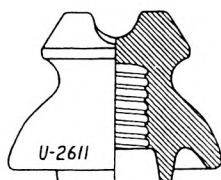
U-2594

$$3\frac{3}{4} \times 3\frac{1}{4}$$



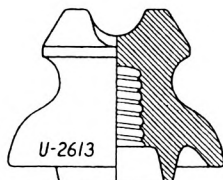
U-2598

$$3\frac{3}{4} \times 3\frac{1}{4}$$



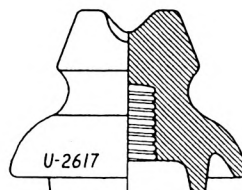
U-2611

$$4\frac{1}{2} \times 3\frac{5}{8}$$



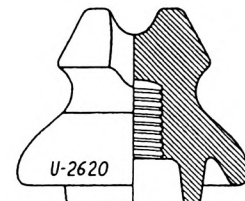
U-2613

$$4\frac{1}{2} \times 3\frac{5}{8}$$



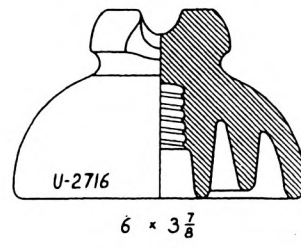
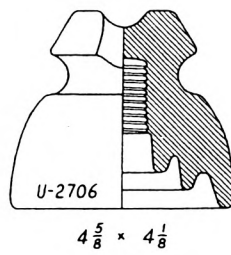
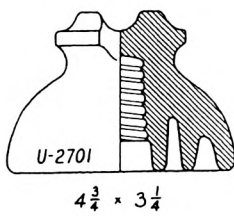
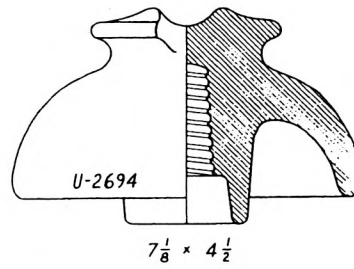
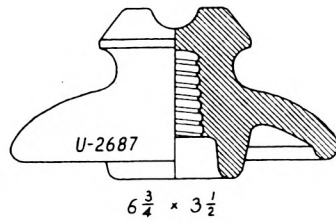
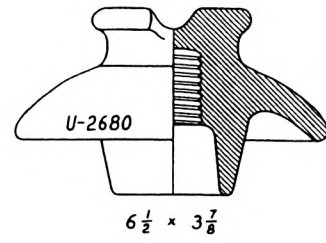
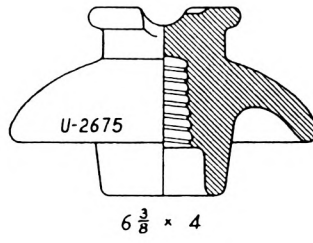
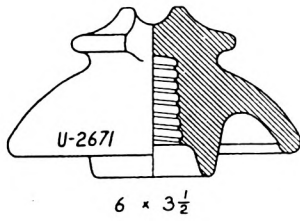
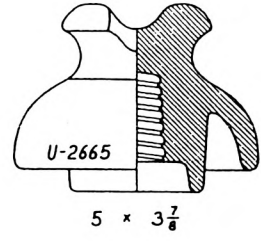
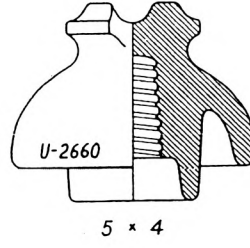
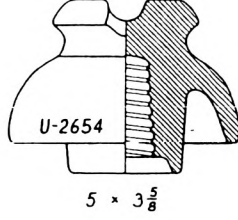
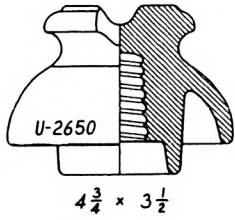
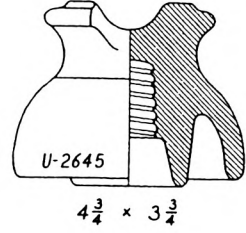
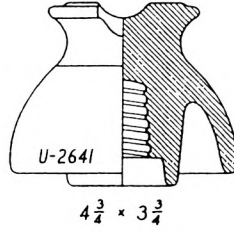
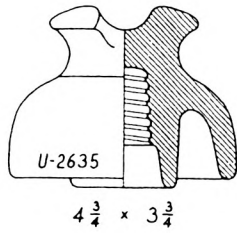
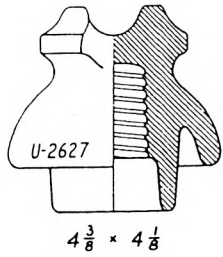
U-2617

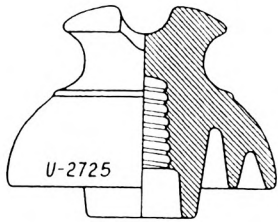
$$4\frac{7}{8} \times 3\frac{7}{8}$$



U-2620

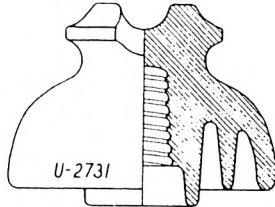
$$4\frac{7}{8} \times 4\frac{1}{8}$$





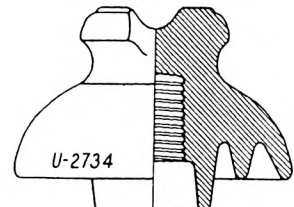
U-2725

$$5\frac{5}{8} \times 4\frac{1}{4}$$



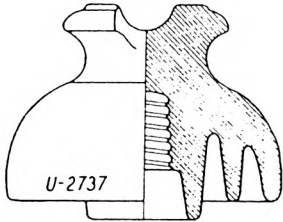
U-2731

$$5\frac{1}{2} \times 4\frac{1}{4}$$



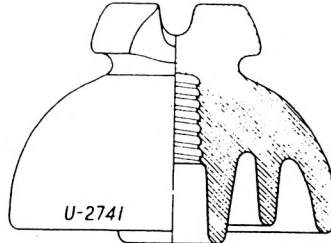
U-2734

$$5\frac{3}{4} \times 4\frac{1}{8}$$



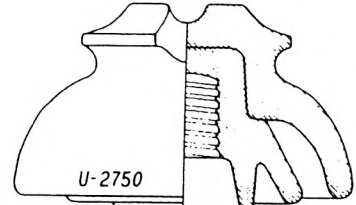
U-2737

$$5\frac{3}{4} \times 4\frac{1}{4}$$



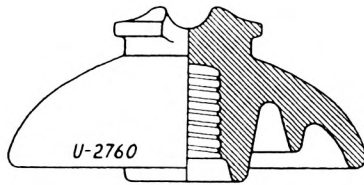
U-2741

$$6\frac{3}{4} \times 4\frac{7}{8}$$



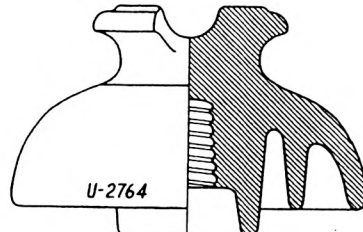
U-2750

$$7 \times 4\frac{1}{4}$$



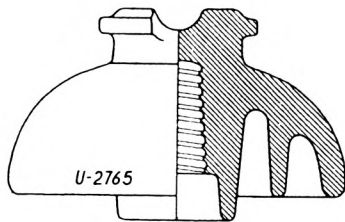
U-2760

$$7\frac{1}{2} \times 3\frac{3}{8}$$



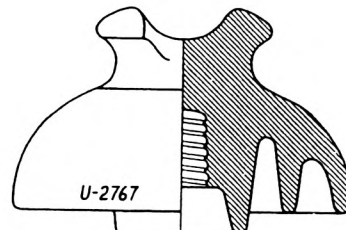
U-2764

$$7\frac{1}{4} \times 4\frac{5}{8}$$



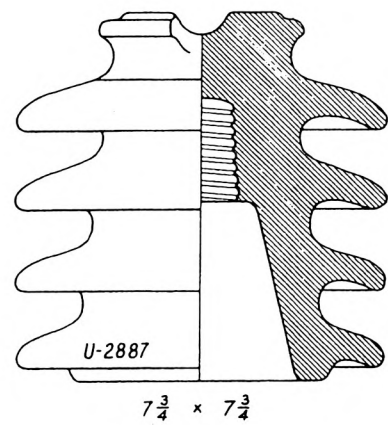
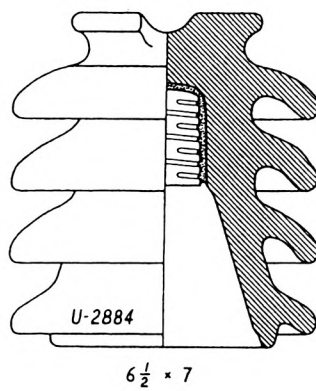
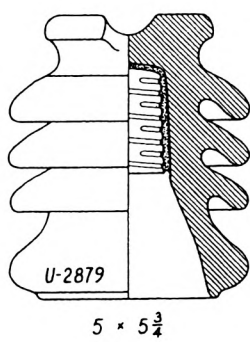
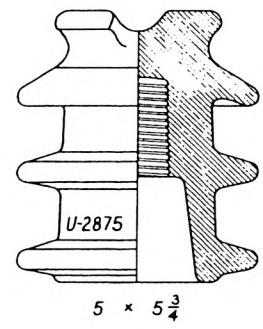
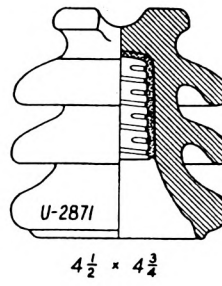
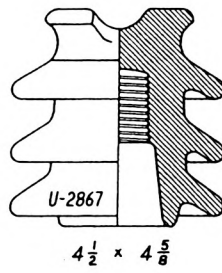
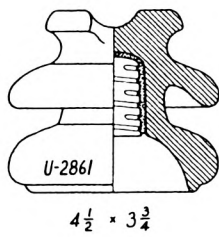
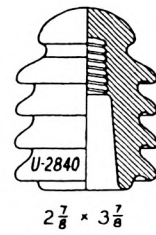
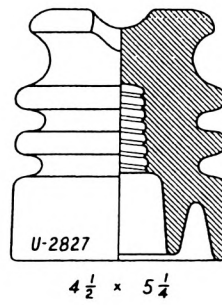
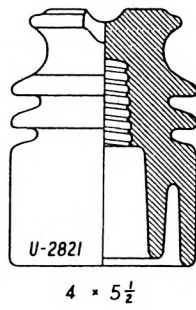
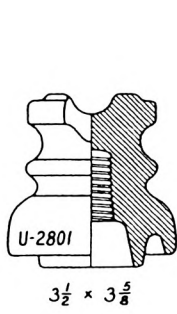
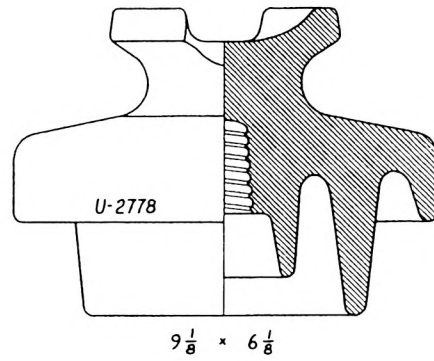
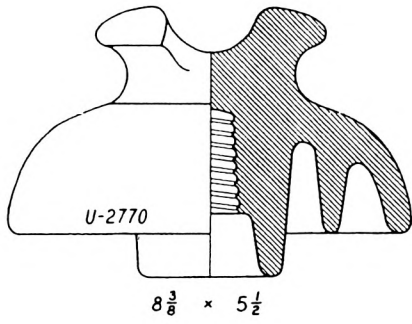
U-2765

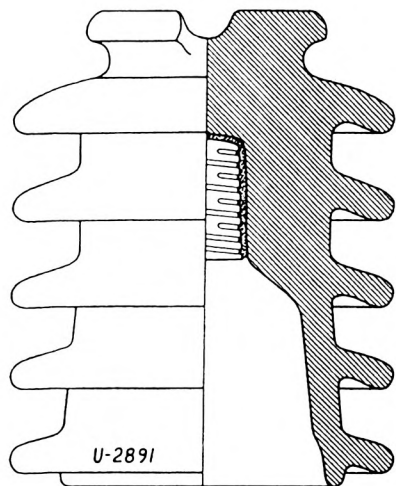
$$7 \times 4\frac{5}{8}$$



U-2767

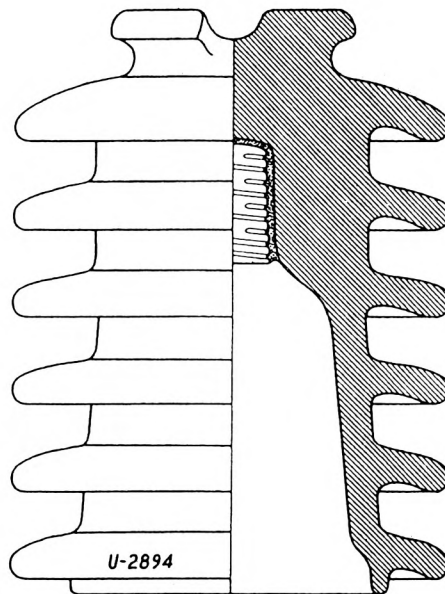
$$7 \times 4\frac{7}{8}$$





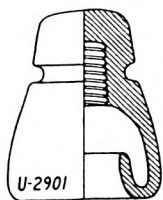
U-2891

$8 \times 9 \frac{5}{8}$



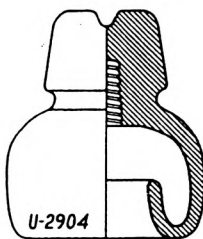
U-2894

$9 \times 11 \frac{5}{8}$



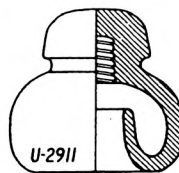
U-2901

$3 \frac{1}{8} \times 4$



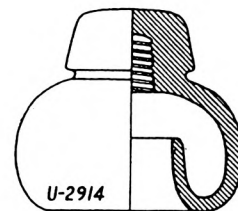
U-2904

$4 \times 4 \frac{3}{4}$



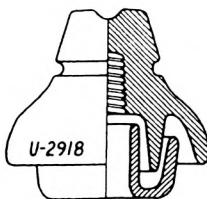
U-2911

$3 \frac{5}{8} \times 3 \frac{3}{8}$



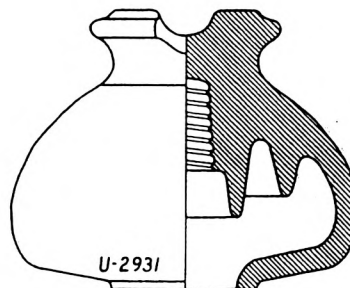
U-2914

$4 \frac{3}{4} \times 4 \frac{1}{4}$



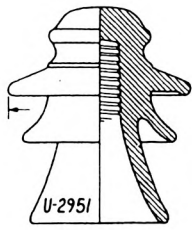
U-2918

$4 \frac{1}{4} \times 4$

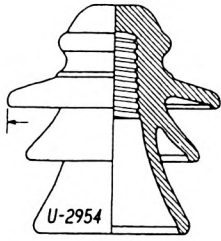


U-2931

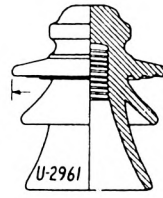
$7 \times 5 \frac{3}{4}$



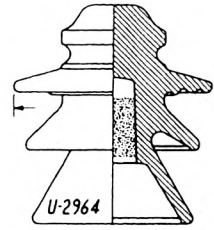
U-2951
 $3\frac{5}{8} \times 4\frac{3}{8}$



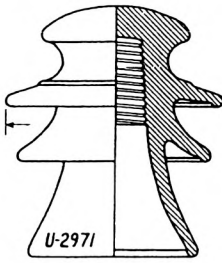
U-2954
 $4\frac{1}{4} \times 4\frac{5}{8}$



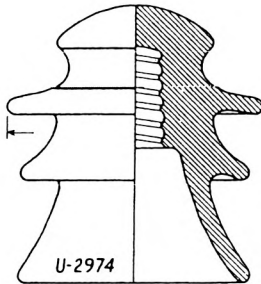
U-2961
 $3\frac{1}{8} \times 3\frac{3}{4}$



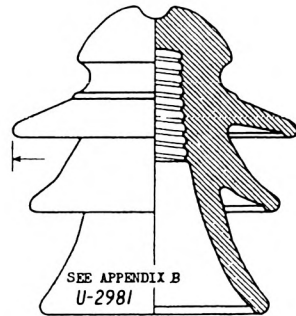
U-2964
 $4 \times 4\frac{1}{2}$



U-2971
 $4\frac{3}{4} \times 5\frac{1}{8}$

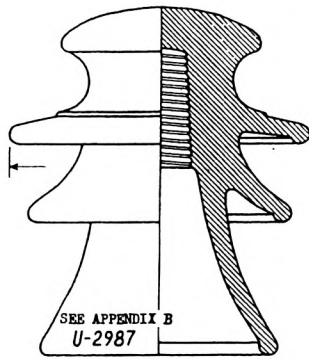


U-2974
 $5\frac{1}{4} \times 5\frac{3}{4}$



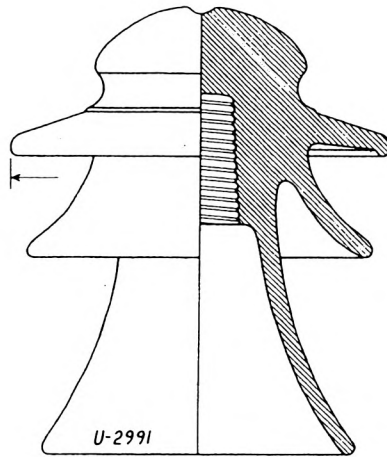
SEE APPENDIX B
U-2981

$5\frac{7}{8} \times 6\frac{1}{2}$



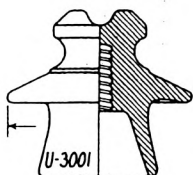
SEE APPENDIX B
U-2987

$6\frac{3}{8} \times 7\frac{1}{4}$

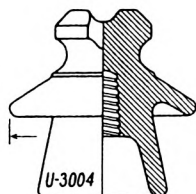


U-2991

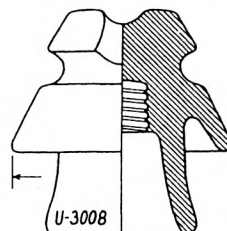
$8\frac{7}{8} \times 9\frac{1}{4}$



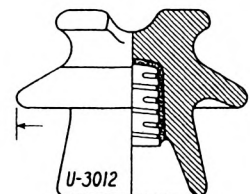
U-3001
 $4 \times 3\frac{1}{2}$



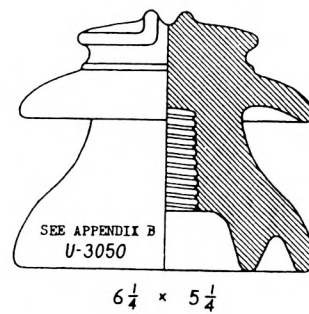
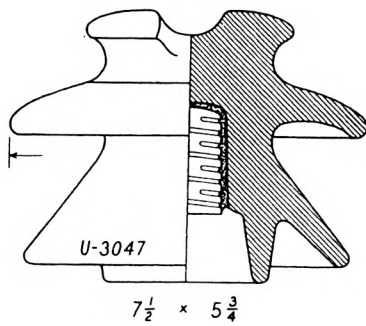
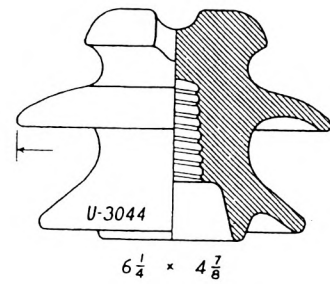
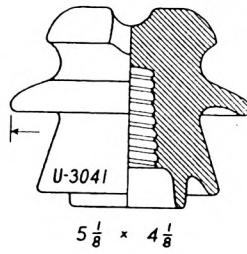
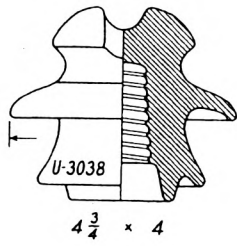
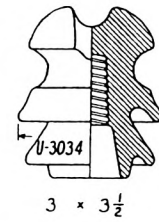
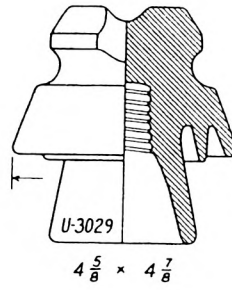
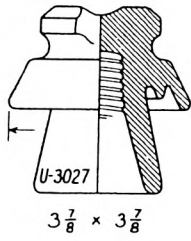
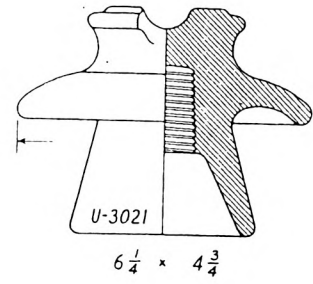
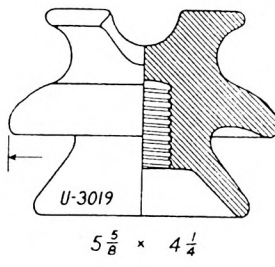
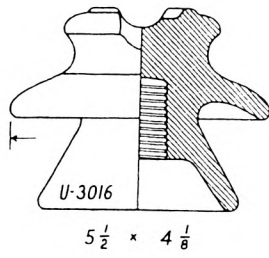
U-3004
 $3\frac{7}{8} \times 3\frac{7}{8}$

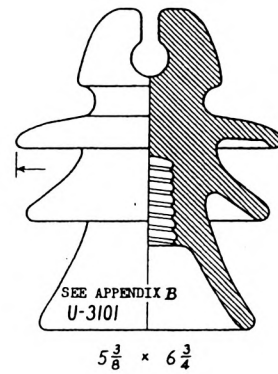
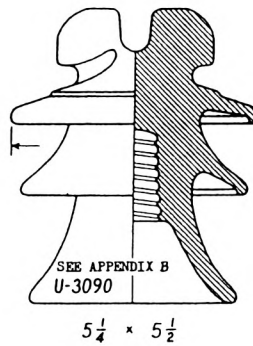
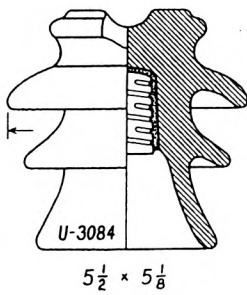
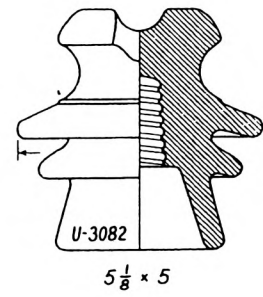
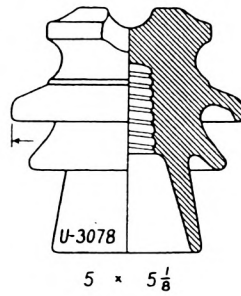
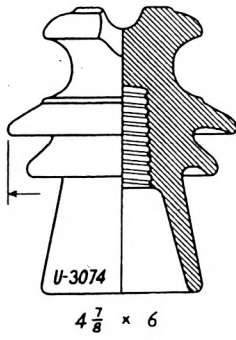
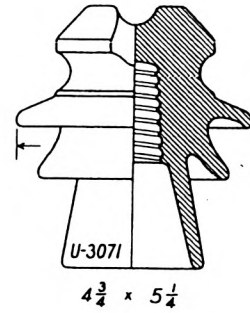
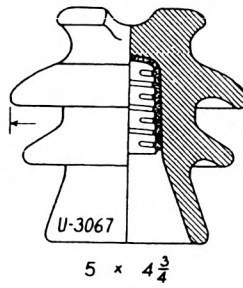
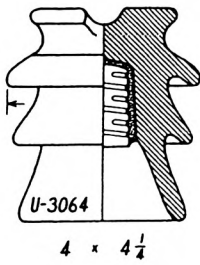
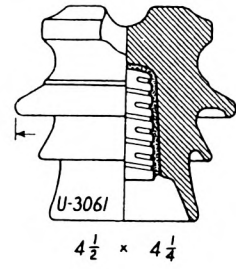
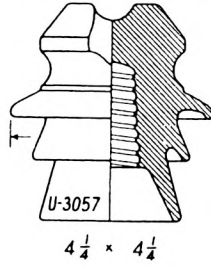
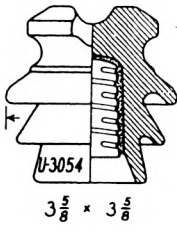


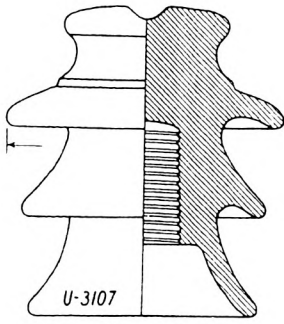
U-3008
 $4\frac{5}{8} \times 4\frac{5}{8}$



U-3012
 $4\frac{3}{4} \times 3\frac{3}{4}$

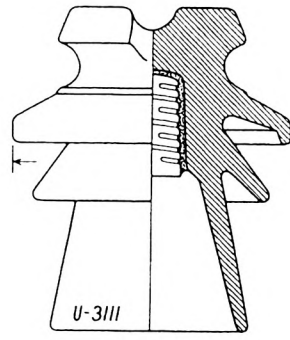






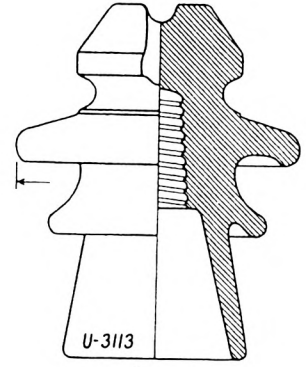
U-3107

$5\frac{3}{4} \times 6\frac{1}{4}$



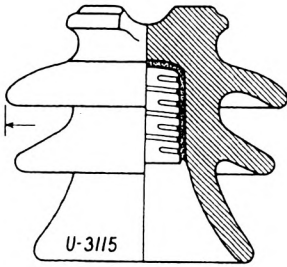
U-3111

$5\frac{3}{4} \times 6\frac{5}{8}$



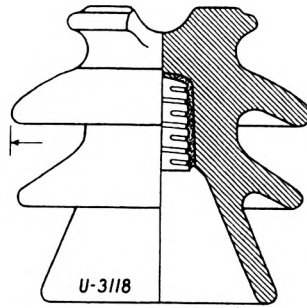
U-3113

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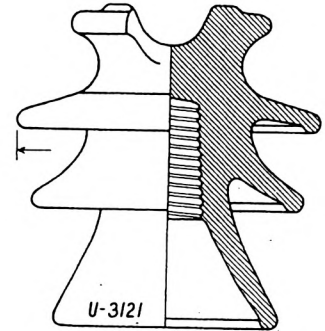
U-3115

$6 \times 5\frac{3}{8}$



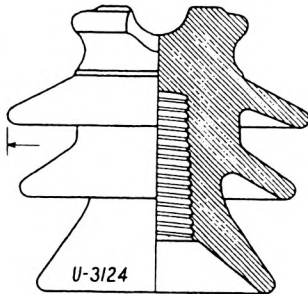
U-3118

6×6



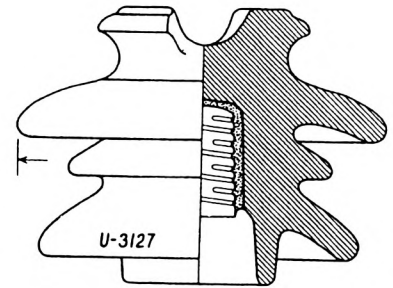
U-3121

$6\frac{3}{8} \times 6\frac{5}{8}$



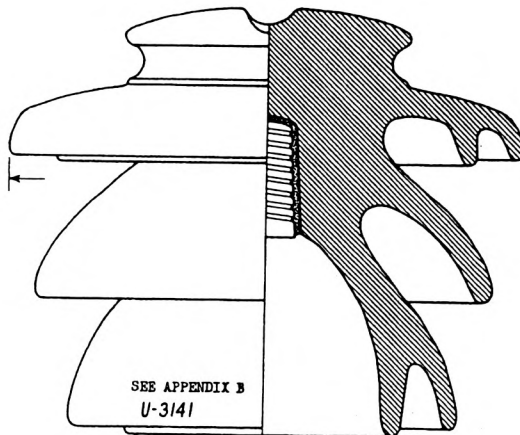
U-3124

$6\frac{5}{8} \times 6\frac{1}{4}$



U-3127

$7\frac{1}{2} \times 5\frac{5}{8}$



SEE APPENDIX B
U-3141

$11\frac{1}{2} \times 9\frac{1}{2}$

APPENDIX A -- Attributions

U-	Known or Probable Origin	Where Found
1103	Probably Korea (mrkg unattrib.)	Korea
1110	(marking unattributed)	Korea
1115	England (Buller, Jobson)	England
1120	England (Buller, Jobson)	England
1123	England (Buller, Jobson)	England
1125	(unmarked)	Italy
1128	(unmarked)	Canada
1131	Canada (Canadian Porcelain Co.)	Canada
1135	England (Bullers)	England, Canada
1136	Japan ("HESCHO" marking)	Canada
1137	(unmarked)	Canada
1142	Canada (Canadian Porcelain Co.)	Canada
1145	(marking unattributed)	Australia
1148	Japan (marking unattributed)	Japan, Australia
1154	Australia (Kopple Potteries)	Australia
1156	England (Bullers + unattrib mrkgs)	England, Australia, Japan
1158	Japan (marking unattributed)	Japan, Australia
1160	Japan (marking unattributed)	Japan, Australia
1175	Prob. Portugal (mrkg unattributed)	Portugal
1179	(unmarked)	Canada
1183	(unmarked)	Canada
1192	Canada (Hamilton Porcelains Ltd)	Canada
1197	Canada (Canadian Porcelain Co.)	Canada
1202	Canada (Canadian Porcelain Co.)	Canada
1210	Probably Korea (mrkg unattributed)	Korea
1214	Probably Sweden (mrkg unattributed)	Sweden
1221	(unmarked)	Holland
1225	Germany (Rosenthal)	Germany
1228	Germany (Rosenthal plus unattributed markings)	Vietnam, Germany, Poland, Iran
1231	Poland (marking unattributed)	Poland
1234	Bulgaria (marking unattributed)	Bulgaria
1237	(unmarked)	Poland
1241	Poland (marking unattributed)	Poland

U-	Known or Probable Origin	Where Found
1243	Germany (marking unattributed)	Germany, Poland
1244	Probably Spain (mrkg unattributed)	Vietnam, Spain
1245	(marking unattributed)	Yugoslavia
1248	Italy (Verbano Ceramics)	Italy
1250	Probably Austria (mrkg unattributed)	Austria, Switzerland, Iran
1254	Probably Poland (mrkg unattributed)	Poland
1257	England (J. E. Saunders & Co.)	England
1261	Probably Poland (mrkg unattributed)	Poland
1267	(marking unattributed)	Greece
1268	(marking unattributed)	Greece
1271	(unmarked)	Switzerland
1274	(unmarked)	Switzerland
1277	Germany (Kronacher)	Germany
1278	Probably Germany (mrkg unattrib.)	Germany
1280	Hungary (Zsolnay)	Hungary
1284	Germany (Rosenthal)	Germany
1287	Probably Germany (mrkg unattrib.)	Germany
1288	Probably Germany (mrkg unattrib.)	Germany
1293	Probably Korea (mrkg unattributed)	Korea, Japan
1294	Probably Korea (mrkg unattributed)	Korea, Japan
1311	(unmarked)	?
1317	England (Buller, Jobson)	England
1324	England (Buller, Jobson)	England, South Africa
1334	(unmarked)	China
1337	(unmarked)	Taiwan
1340	(marking unattributed)	Taiwan
1347	(unmarked)	Vietnam
1352	(unmarked)	Canada
1359	England (Buller, Jobson)	England
1364	England (Buller, Jobson)	England
1371	Probably Korea (mrkg unattributed)	Korea, Japan
1381	Japan (NGK)	Japan, Iran
1385	(marking unattributed)	Czechoslovakia
1388	(unmarked)	Czechoslovakia
1392	England (Bullers)	Island of Diego Garcia, England, Canada

U-	Known or Probable Origin	Where Found
1397	England (Buller, Jobson)	England
1404	Japan (NGK)	Japan
1408	New Zealand (NZI)	New Zealand
1411	England (Taylor, Tunnicliff)	England, New Zealand
1414	New Zealand (NZI)	New Zealand
1421	(unmarked)	New Zealand
1427	(unmarked)	Island of Antigua
1431	Probably Norway (mrkg unattributed)	Norway
1434	U.S. (Locke export catalog)	Canada
1435	Probably Norway (mrkg unattributed)	Norway
1445	England (Macintyre)	England, New Zealand
1451	Prob. Engd (Bullers, Taylor-Tunn'f)	England
1452	England (Bullers)	England
1456	Prob. Portugal (mrkg unattributed)	Portugal
1461	(marking unattributed)	?
1463	Probably Korea (mrkg unattributed)	Japan, Korea
1471	Prob. Denmark (mrkg unattributed)	Denmark
1481	England (Buller, Jobson)	England
1491	(unmarked)	Australia
1493	(unmarked)	Australia
1497	(unmarked)	Australia
1500	(unmarked)	Australia
1502	(unmarked)	Australia
1503	(unmarked)	Australia
1521	England (Bullers, Taylor-Tunnicliff)	England, New Zealand
1524	England (Taylor, Tunnicliff)	England, Australia
"	New Zealand (NZI)	New Zealand
1528	New Zealand (NZI)	New Zealand
1531	New Zealand (NZI)	New Zealand
1534	New Zealand (NZI)	New Zealand
1540	New Zealand (NZI)	New Zealand
1542	Probably England (G.P.O. mrkg)	England, Ireland, Iran
1546	Probably England (G.P.O. mrkg)	England, Ireland, Scotland
1549	Probably England (G.P.O. mrkg)	England, Ireland, Scotland
1559	Finland (Turku and Arabia)	Finland
1563	(marking unattributed)	Fiji Islands

U-	Known or Probable Origin	Where Found
1565	England (Bullers or Taylor-Tumicl.)	England, Ireland, Fiji Isl.
1567	England (Bullers, G & G)	England, Ireland, Fiji Isl..
1569	England (Bullers)	England
1571	Probably England (unmarked)	Chile
1573	England (Bullers)	England, Fiji Islands
"	New Zealand (NZI)	New Zealand
1578	Probably England (G.P.O. mrkg)	England, Ireland
1584	(unmarked)	Australia
1587	England (Buller, Jobson)	England
1592	(unmarked)	?
1595	England (Buller, Jobson)	England
1600	England (Buller, Jobson)	England, South America
1603	England (Buller, Jobson)	England, Italy
1606	U.S. (Locke export catalog)	Canada
1621	(unmarked)	?
1624	(unmarked)	France
1627	England (Buller, Jobson)	England
1631	(unmarked)	Germany
1633	Prob. Portugal (mrkg unattributed)	Portugal
1637	Italy (I.M.E.C.)	Italy
1640	Probably Hungary (unmarked)	Hungary
1642	Finland (Turku & Arabia Potteries)	Finland
1644	Japan (marking unattributed)	Japan
1647	(unmarked)	Spain
1650	U.S. (Locke export catalog)	Canada
1652	Finland (Turku)	Finland
"	(unattributed markings)	Iran, Russia
1654	(unmarked)	Russia, Switzerland
1656	(unmarked)	Russia
1658	Prob. Bulgaria (mrkg unattributed)	Bulgaria
1660	(unmarked)	Brazil
1663	(unmarked)	Vietnam
1665	Prob. Hungary (mrkg unattributed)	Hungary
1668	Italy (I.M.E.C.)	Italy
1671	England (for G.P.O.)	England, New Zealand, Fiji
1673	Probably England (unmarked)	New Zealand

U-	Known or Probable Origin	Where Found
1677	(marking unattributed)	Spain, Korea
1680	England (Buller, Jobson)	England, South America
1683	Finland (Turku)	Finland
1686	(unmarked)	Russia
1688	Finland (Turku & Arabia Potteries)	Finland
1690	Prob. Denmark (mrkg unattributed)	Denmark
1692	Switzerland (Suisse Langenthal plus other unattributed markings)	Switzerland, Japan, Turkey, Saudi Arabia, Luxembourg, China, Holland, Greece
1694	Prob. Bulgaria (mrkg unattributed)	Bulgaria
1695	Spain (Manufact. Ceramicas S.A.)	Spain
1696	(marking unattributed)	?
1700	(unmarked)	Vietnam
1702	England (Buller, Jobson)	England, South America
1705	U.S. (Locke export catalog)	Canada
1707	Italy (Richard Ginori)	Italy
1710	Probably Russia (mrkg unattributed)	Russia
1714	England (Buller, Jobson)	England, India
1718	England (Buller, Jobson)	England, New Zealand
1722	(unmarked)	Australia
1725	England (Buller, Jobson)	England
1731	U.S. (Locke export catalog)	Canada
1733	England (Buller, Jobson)	England, India
1735	Bulgaria (marking unattributed)	Bulgaria, Germany
1737	Switzerland (Suisse Langenthal)	Switzerland
1741	(markings unattributed)	Switzerland, Germany
1743	(unmarked)	Germany
1745	Germany (Rosenthal)	Germany
1750	England (Buller, Jobson)	England, South America
1754	(unmarked)	Germany
1757	(unmarked)	Germany
1762	Spain (Manufacturas Ceramicas S.A.)	Spain
1767	(marking unattributed)	Finland
1770	Japan, Bulgaria (mrkg unattributed)	Pakistan
1774	Probably Korea (unmarked)	Korea
1784	(unmarked)	Russia

U-	Known or Probable Origin	Where Found
1788	England (Buller, Jobson)	England, South America
1792	(unmarked)	Bulgaria
1801	Probably Sweden (mrkg unattributed)	Sweden
1804	Prob. Denmark (mrkg unattributed)	Denmark
1811	(marking unattributed)	Iceland
1816	(unmarked)	Korea
1821	(marking unattributed)	Russia
1824	Probably Poland (mrkg unattributed)	Poland
1831	England (Allied Insulators)	England
1837	Probably Spain (mrkg unattributed)	Spain
1841	England (Buller, Jobson)	England, India
1847	England (Buller, Jobson)	England, South America
1870	Canada (Canadian Porcelain Co.)	Canada
1875	Canada (Canadian Porcelain Co.)	Canada
1877	Canada (Canadian Porcelain Co.)	Canada
1882	England (Buller, Jobson)	England
1890	Germany (Rosenthal)	Germany
1897	Prob. Switzerland (mrkg unattrib.)	Poland, Switzerland
1898	Germany (Rosenthal)	Germany
1907	Canada (Canadian Porcelain Co.)	Canada
1912	(unmarked)	Australia
1917	Canada (Canadian Porcelain Co.)	Canada
1925	England (unmarked)	England
1929	New Zealand (NZI)	New Zealand
1935	Switzerland (Suisse Langenthal)	Switzerland
1938	(marking unattributed)	Australia
1941	Probably England (G.P.O. mrkg)	England, Fiji Islands
1944	England (Taylor, Tunnicliff)	England
1950	England (Bullers, Taylor-Tunnicl.)	England
1954	England (mrkg unattributed)	Australia
1960	(unmarked)	Canada
1980	(unmarked)	England
1985	England (Buller, Jobson)	England
1991	England (Buller, Jobson)	England
1996	England (Buller, Jobson)	England
2001	England (Buller, Jobson)	England

U-	Known or Probable Origin	Where Found
2004	England (Buller, Jobson)	England
2007	England (Buller, Jobson)	England, South America
2009	England (Buller, Jobson)	England
2012	England (Buller, Jobson)	England
2015	England (Buller, Jobson)	England, Spain
2019	U.S. (Ohio Brass Co., for export, drawing noted "Cuban Type")	Canada
2022	England (Buller, Jobson)	England, Norway, Sweden
2027	(marking unattributed)	Iceland
2034	(unmarked)	Spain
2041	Probably Korea (mrkg unattributed)	Korea
2044	England (Buller, Jobson)	England
2051	(unmarked)	Vietnam
2057	(unmarked)	Vietnam, Tunisia
2061	(unmarked)	Spain
2071	(unmarked)	?
2081	Portugal (mrkg unattributed)	Portugal
2085	(unmarked)	Vietnam
2091	Probably Korea (mrkg unattributed)	Korea
2097	(markings unattributed)	Vietnam, Holland
2121	Germany (Rosenthal)	Germany
"	Prob. Bulgaria (mrkg unattributed)	Bulgaria
2131	Probaly Poland (mrkg Unattributed)	Poland
2137	(unmarked)	Poland
2200	(unmarked)	Belgium
2210	(unmarked)	Belgium
2215	(unmarked)	Canada
2221	Japan (NGK)	Japan
2224	Japan (NGK)	Japan, Canada
2231	Canada (National Porcelain Co.)	Canada
2237	Canada (National Porcelain Co.)	Canada
2239	(unmarked)	Canada
2247	(unmarked)	Canada
2251	Germany (Kronacher)	Germany
2254	Probably Hungary (unmarked)	Hungary
2257	Germany (Rosenthal)	Germany

U-	Known or Probable Origin	Where Found
2260	Germany (Kronacher)	Germany
2263	(unmarked)	Germany
2265	Germany (AGROB)	Germany
2275	Prob. Finland (unmarked)	Finland
2278	(marking unattributed)	Israel
2279	(marking unattributed)	Japan, Iran, Hungary
2281	Germany (Kronacher)	Germany, Israel
2285	Finland (Turku)	Finland
2290	Prob. Germany (mrkg unattributed)	Germany
2294	Bulgaria (marking unattributed)	Bulgaria
2301	Finland (Turku)	Finland
2303	Finland (Turku)	Finland
2308	Germany (Kronacher)	Germany
2310	Germany (Kronacher)	Germany
2312	Germany (Kronacher)	Germany
2321	Germany (Kronacher)	Germany
2324	Germany (Kronacher)	Germany
2345	South Africa (Cullinan)	South Africa
2347	South Africa (Cullinan)	South Africa
2349	South Africa (Cullinan)	South Africa
2351	South Africa (Cullinan)	South Africa
2360	(unmarked)	Czechoslovakia
2364	England (Bullers)	England, Iran
2370	Probably Japan (unmarked)	Japan, Australia
2372	Japan (marking unattributed)	Japan
2374	Japan (NGK, OTK + unattrib. mrkgs)	Japan
"	Australia (Kopple Potteries)	Australia
2376	(unmarked)	Australia
2377	Prob. Japanese export (unmarked)	Australia
2382	Prob. China & Japan (mrkgs unattrib.)	Japan, China, Australia
2385	Prob. Japanese export (unmarked)	Australia
2387	Prob. Japanese export (unmarked)	Australia
2389	Prob. Japanese export (unmarked)	Australia
2391	Taiwan (LTL)	Taiwan, Australia
2393	Prob. Japanese export (unmarked)	Australia
2396	Taiwan (LTL)	Taiwan

U-	Known or Probable Origin	Where Found
2398	Prob. Japanese export (unmarked)	Fiji Islands
2421	Canada (Canadian Porcelain Co.)	Canada
2427	Canada (National Porcelain Co.)	Canada
2431	Japan (OTK)	Japan
2437	Japan (NGK)	Japan
2447	Australia (DIA)	Australia
2451	Canada (Canadian Porcelain Co.)	Canada
2461	Canada (Canadian Porcelain Co.)	Canada
2465	Canada (Canadian Porcelain Co.)	Canada
2475	New Zealand (NZI)	New Zealand
2485	England (G & G)	England, New Zealand
2491	Canada (Canadian Porcelain Co.)	Canada
2497	New Zealand (NZI)	New Zealand
2503	Canada (National Porcelain Co.)	Canada
2512	Japan (marking unattributed)	Japan, Australia
2521	(unmarked)	Norway
2531	Japan ("HESCHO" marking)	Canada
2537	New Zealand (NZI)	New Zealand
2542	Canada (Canadian Porcelain Co.)	Canada
"	New Zealand (NZI)	New Zealand
2547	England (G & G)	England, New Zealand
2552	(unmarked)	New Zealand
2555	(unmarked)	New Zealand
2561	England (G & G)	England, Canada
2571	(unmarked)	Canada
2574	Canada (National Porcelain Co.)	Canada
2578	South Africa (Cullinan)	South Africa
2582	Canada (Canadian Porcelain Co.)	Canada
2586	England (Taylor, Tunnicliff)	England, Fiji Islands
2590	(unmarked)	Canada
2594	(unmarked)	Canada
2598	Canada (Canadian Porcelain Co.)	Canada
2611	Canada (Canadian Porcelain Co.)	Canada
2613	England (Bullers)	England
"	Canada (Canadian Porcelain Co.)	Canada
"	Australia (markings unattributed)	Australia

U-	Known or Probable Origin	Where Found
2617	Prob. Japanese export (unmarked)	Australia
2620	England (Bullers)	England
"	Canada (Canadian Porcelain Co.)	Canada
"	Prob. Australia (mrkg unattributed)	Australia
2627	Canada (Canadian Porcelain Co.)	Canada
2635	England (Doulton)	England
2641	Japan (NGK)	Japan
2645	Japan (OTK)	Japan
2650	Probably England (unmarked)	New Zealand
2654	England (Taylor, Tunnicliff)	England
2660	Canada (Canadian Porcelain Co.)	Canada
2665	Canada (National Porcelain Co.)	Canada
2671	Canada (Canadian Porcelain Co.)	Canada
2675	New Zealand (NZI)	New Zealand
"	Canada (Canadian Porcelain Co.)	Canada
2680	Japan (OTK)	Japan, Australia
2687	Canada (Canadian Porcelain Co.)	Canada
2694	Japan (NGK)	Japan
2701	England (Bullers)	England, New Zealand
"	Canada (Canadian Porcelain Co.)	Canada
2706	Probably Korea (mrkg unattributed)	Korea
2716	Canada (Canadian Porcelain Co.)	Canada
2725	England (Doulton)	England
2731	Canada (Canadian Porcelain Co.)	Canada
2734	Prob. Australia (mrkg unattributed)	Australia
2737	South Africa (Cullinan)	South Africa
2741	Canada (Canadian Porcelain Co.)	Canada
2750	Canada (Canadian Porcelain Co.)	Canada
2760	Canada (Canadian Porcelain Co.)	Canada
2764	South Africa (Cullinan)	South Africa
2765	Canada (Canadian Porcelain Co.)	Canada
2767	England (Doulton)	England
2770	England (Doulton)	England
2778	South Africa (Cullinan)	South Africa
2801	(unmarked)	Norway
2821	Japan (NGK)	Japan

U-	Known or Probable Origin	Where Found
2827	New Zealand (NZI)	New Zealand
2840	England (Buller, Jobson)	England
2861	Canada (Canadian Porcelain Co.)	Canada
2867	Japan (OTK)	Japan
2871	Canada (Canadian Porcelain Co.)	Canada
2875	Japan (OTK)	Japan
2879	Canada (Canadian Porcelain Co.)	Canada
2884	Canada (Canadian Porcelain Co.)	Canada
2887	Japan (OTK)	Japan
2891	Canada (Canadian Porcelain Co.)	Canada
2894	Canada (Canadian Porcelain Co.)	Canada
2901	England (Buller, Jobson)	England
2904	Japan (marking unattributed)	Japan, Pakistan
2911	England (Buller, Jobson)	England
2914	England (Buller, Jobson)	England
2918	England (Buller, Jobson)	England
2931	Taiwan (LTL)	Taiwan
2951	Probably Spain (unmarked)	Spain
2954	Spain (Manufacturas Ceramicas S.A.)	Spain
2961	Probably Spain (unmarked)	Spain
2964	Probably Spain (unmarked)	Spain
2971	Finland (Turku)	Finland
2974	England (Doulton)	England
2981	Germany (AGROB)	Germany
2987	Finland (Turku)	Finland
2991	Prob. Iceland (mrkg unattributed)	Iceland
3001	England (Bullers, Macintyre)	England, New Zealand
3004	New Zealand (NZI)	New Zealand
3008	(unmarked)	Taiwan
3012	Japan (OTK)	Japan
3016	England (Doulton)	England
"	New Zealand (NZI)	New Zealand
"	Japan (NGK + unattributed marking)	Japan
3019	Japan (NGK)	Japan, Australia
3021	Japan (OTK)	Japan
3027	(unmarked)	Korea

U-	Known or Probable Origin	Where Found
3029	Probably Korea (mrkg unattributed)	Korea
3034	England (Taylor, Tunnicliff)	England
3038	England (Taylor, Tunnicliff)	England
3041	England (Taylor, Tunnicliff)	England
3044	England (Taylor, Tunnicliff)	England
3047	England (Doulton)	England
3050	Germany (Hunsrück)	Germany
3054	England (Allied Insulators)	England
3057	England (Allied Insulators)	England
"	New Zealand (NZI)	New Zealand
3061	England (Allied Insulators)	England
3064	Japan (NGK)	Japan
3067	Japan (OTK)	Japan
3071	England (Bullers, Allied Insulators)	England
3074	New Zealand (NZI)	New Zealand, Australia
3078	England (Allied Insulators)	England
3082	New Zealand (NZI)	New Zealand
3084	Japan (NGK)	Japan
3090	Germany (Kronacher)	Germany
3101	Germany (AGROB)	Germany
3107	(marking unattributed)	Poland, New Zealand
3111	England (Taylor, Tunnicliff)	England
3113	England (Bullers)	England
"	New Zealand (NZI)	New Zealand
3115	Japan (NGK)	Japan
3118	Japan (OTK)	Japan
3121	Finland (Turku)	Finland
3124	Finland (Turku)	Finland
3127	Japan (NGK)	Japan
3141	Germany (AGROB)	Germany

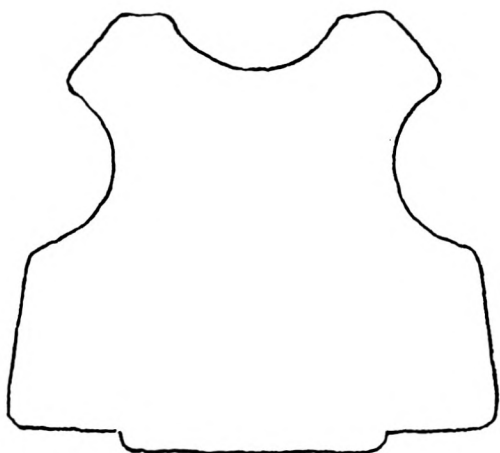
DRAWINGS MADE FROM SHADOW PROFILES

We can make essentially perfect drawings of average insulators without you having to loan specimens by mail. All we need is a shadow profile and the measured insulator dimensions. Here's how you can do this in just a few minutes times.

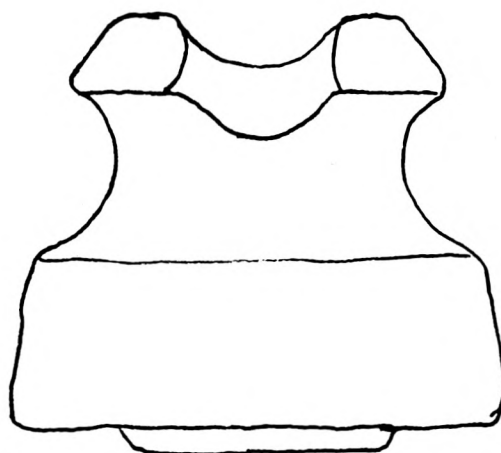
Place the insulator on a sheet of paper on the floor directly below a ceiling light fixture. Plumb the true vertical with a string. Unscrew all but one bulb in the fixture to eliminate multiple shadows. Prop up the top of the insulator so its axis will remain parallel to the floor without you having to hold it.

Now carefully trace onto the paper the shadow cast by the insulator. This should look like Figure A below. Do not tweek up the lines on this profile or add any other detail to it (dimensions, hidden lines, etc.).

If necessary on some insulator styles, make a separate sketch, like Figure B below, to show crown detail and other hidden exterior features which do not show in the shadow tracing.



A. Raw shadow profile.



B. Sketch for crown detail.

Now measure and record the following dimensions:

- A. Overall height of the insulator
- B. Overall outside diameter at base of the outer skirt
- C. Centerline diameter of any interior petticoat(s)
- D. Amount petticoat extends below the skirt, or amount it is recessed above the skirt rim
- E. Height of the slot between outer skirt and petticoat(s)
- F. Height of the "collar" where the threads start
- G. Height of the pin hole top
- H. Approximate diameter of pin hole and type of "threads"

Make all the vertical measurements from the very bottom surface of the insulator, whether that be the outer skirt or an interior petticoat. It's handy to cut a narrow cardboard strip and measure its penetration up into the pin hole and various recesses.

BIBLIOGRAPHY

(Books on Porcelain Insulators)

- Brown, Gerald, Collectible Porcelain Insulators. Photos, sketches, catalog pages and general information on all forms of porcelain insulators and related items. Although this book contains many pin types, its greatest value is as a general reference on other forms of insulators from small knobs through multipart pin types. Numerous patent illustrations. Second Edition, 1972, softbound, 8½" x 11", 176 pp., plus Supplement, 1974, softbound, 8½" x 11", 74 pp., both for \$7.50 from the author, Gerald Brown, Box 1, Two Buttes, CO 81084.
- Brown, Gerald, Fred M. Locke And His Insulators. A specialized book on Locke insulators. Very Comprehensive. An absolute must for those specializing in Locke items. Published 1977, softbound, 7" x 8½", 90 pp., \$5 ppd from Gerald Brown, Box 1, Two Buttes, CO 81084.
- Kareofelas & Cranfill, Dictionary of Glass - Ceramic Insulators Reprint. Reprints of selected pages from old insulator and poleline hardware catalogs. Considerable interesting information and a useful reference on many forms of insulators and related items not illustrated in other publications. Softbound, 8½" x 11", \$6 postpaid from Gary Cranfill, 6353 Buckeye Lane, Roseville, CA 95678.
- Mills, Brent, Porcelain Insulators and How They Grew. A detailed history of the U.S. porcelain insulator industry, mainly major manufacturers of wet process pin types. Has no information on dry press porcelain insulators or the manufacturers specializing in them. This book is not collector oriented with any style drawings and prices, but it is recommended for the library of serious collectors. Published 1970, hardbound, 6" x 9", 228 pp., \$10 ppd from the author Brent Mills, 40 Wolcott St., LeRoy, NY 14482.
- Peters, Frank, (catalog reprints). The Locke Insulator Mfg. Co., catalog #9 (1906), 64 pp. C. S. Knowles, catalog #20 (1902), 50 pp. Very typical examples of early porcelain catalogs, well worth the \$3 each (or both for \$5 ppd). From Frank Peters (books), 495 Carr Avenue, Aromas, CA 95004.
- Tod, Jack H., Electrical Porcelain -- A History of the Industry in the United States. A very comprehensive reference book on all forms of electrical porcelain insulators other than pin types and high voltage insulators. Contains the history of electrical porcelain insulators from their inception to modern times, histories of all companies (over 100) known to have made electrical porcelain insulators, every known manufacturer's marking on electrical porcelain, illustrations and descriptions of all wiring insulator types, manufacturing processes, all pertinent registered trademarks. Additionally it has a listing and brief data on every insulator patent (nearly 700) from 1880 to date which are potentially of any interest to collectors, including hundreds of patents on porcelain and glass pin types. Published 1977, softbound, 8½" x 11", 180 pp., \$14.75 plus 90¢ shipping from author, Jack H. Tod, 3427 N. 47th Place, Phoenix, AZ 85018.

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Tod, Jack H., Porcelain Insulators Guide Book for Collectors. The most comprehensive reference on unipart pin type insulators, including both dry process and wet process. Evolution of insulator styles, the Universal Style Chart with scale drawings of every known U.S. style manufactured (over 940), history of all manufacturers, every known marking on pin types, etc. The primary reference used by insulator collectors. Second Edition, 1976, softbound, 8½" x 11", 160 pages, \$22.40 plus 70¢ shipping from Jack H. Tod, 3427 N. 47th Pl., Phoenix, AZ 85018.

(Books on Glass Insulators)

Albers, Marilyn, Glass Insulators from Outside North America. The primary reference on foreign glass pin type insulators with the Consolidated Design Chart and reference numbers for foreign styles, listing and attributions of foreign glass insulator embossings, etc. Published 1981, softbound, 8½" x 11", 20 pp., \$3 plus 71¢ shipping from author Marilyn Albers, 14715 Oak Bend Drive, Houston, TX 77079.

Milholland, Marion & Evelyn, Most About Glass Insulators. One of two primary reference books on North American glass insulators. Pictures every known glass pin type style and tabulates all known color and embossing varieties for each style. Also information on glass insulators other than pin types. The Fourth Revision, 1976, hardbound, 6" x 9", 456 pp., \$15 plus \$1.09 shipping. The companion Price List book, \$4.50 plus 63¢ shipping. Both from Evelyn Milholland, 145 E. 168th, Spanaway, WA 98387.

Woodward, N. R., The Glass Insulator in America, 1973 Report. A primary reference book used by all collectors of U.S. glass insulators. An original-research book with histories of all of the glass insulator manufacturers, the complete Consolidated Design Chart with drawings of all pin type styles, etc. Published 1973, softbound, 8½" x 11", 90 pages, \$4.85 plus 70¢ shipping from the author, N. R. Woodward, P.O. Box 171, Houston, TX 77001.

(Other Books and Periodicals)

Brown, Gerald, Unique Collectible Insulators. Virtually a complete reference on all forms of antique insulators made from materials other than glass and porcelain -- wood, metal-cased, composition, plastic and rubber. Many illustrations, patent illustrations, old magazine ads on these insulators, etc. Published 1975, softbound, 8½" x 11", 109 pp., \$6 ppd from Gerald Brown, Box 1, Two Buttes, CO 81084.

Harned, Dora (Editor and Publisher), Insulators, Crown Jewels of the Wire (periodical, issued monthly). The only nationally circulated magazine devoted exclusively to the insulator collecting hobby. Feature articles, research department, porcelain insulator column, foreign insulator column, letters from collectors, show reports, classified ad section, etc. Each March issue is a name-and-address directory of all subscribers. Softbound, 5½" x 8½", \$10 per 12 issues (\$12 outside U.S.), from Dora Harned, Rt. 1, Box 475, Chico, CA 95926.

