

*Call on
Whittaker
for*

*Minerals
Colors
Pigments*



CF-BALL-10

WHITTAKER
260 West Bro

, Inc.
, N.Y.

PLAINTIFF'S
EXHIBIT
WCD-57

ALBATEX—Substitute for Zinc Oxide.
ALUMINUM SILICATE—Natural, High and Low Alumina.
ALUMINUM STEARATE—High, Medium and Low Gel.
ASBESTOS—Shorts, Fibre, Powdered.
ATOMITE—Natural Calcium Carbonate, Wet Ground.
AQUALINE BLUE
BARIUM CARBONATE—Precipitated.
BARIUM SULFATE—Natural, Precipitated.
BARIUM STEARATE
BARYTES—Off Color, Prime White Water Floated.
BENTONITE—Volclay, KWK, High and Low Gel, Powdered, Granular.
BLACKS—Lump, Mineral, Oxide.
BLANC FIXE—By-Product, Direct Process.
BLUE—Phthalocyanine, Ultramarine.
CALCITE—Powdered, Granular.
CALCIUM CARBONATE—Natural, Precipitated, Commercial, Technical, U.S.P.
CALCIUM HYDROXIDE—Powdered.
CALCIUM OXIDE
CALCIUM STEARATE
CALCIUM SULFATE—Anhydrous, Natural.
CHALK—Lump, Pellets, Prepared, Cliffstone, Whiting, Precipitated, U.S.P., French.
CLAYS—Colloidal, English, Domestic, Ball, Modeling, China.
CLIFFSTONE WHITING—Dry and Wet Ground.
COLORS—Natural Earth, Lo-Micron.
COSMETIC COLORS—Certified D & C, Lo-Micron.
CROCUS MARTIS—Venetian Red.
CHROMIUM OXIDE GREEN
CRAYONS—"Clover" Brand, Metal Workers.
CYCLONOX—Polishing, Abrasive.
DENTAL PLASTER
DIATOMACEOUS EARTH—Natural, Powdered.
EARTH COLORS—Natural, Lo-Micron.
FELDSPAR—Powdered, Graded.
FIBROUS TALC—Powdered, Lo-Micron.
FILTER AIDS—Fullers Earth, Talc, Magnesia Carbonate, Pumice, Quartz.
FILTERING EARTHS—Clays, Fullers Earth.
FLINT—Powdered, Graded.
FLUORSPAR—Powdered, Graded.
FORMALDEHYDE DUST—Agricultural.
FOSSIL FLOUR—Infusorial Earth, Diatomaceous Earth, Kieselguhr.
FULLERS EARTH—Powdered, Granular.
FUSE FILLER—Pellets.
GRAPHITE—Powdered.
GROUND GLASS—Powdered, Graded.
GYPSUM—Terra Alba, Powdered.
HYDRATED LIME—Powdered, High Calcium.
HYDRO MAGMA—Base Material for Milk of Magnesia.
INFUSORIAL EARTH—Natural, Powdered.
IRON OXIDE—Red, Black, Yellow.
KAOLIN—Washed, Colloidal, Air Floated, Lo-Micron, Lump, Powdered.
KIESELGUHR—Natural, Powdered.
LESAMITE—Controlled Particle Size Calcium Carbonate.

LIME—Powdered, Lump, Vienna.
LIMESTONE—Ground, Agricultural, Graded.
MAGNESIUM CARBONATE—Light, Heavy, U.S.P., Technical.
MAGNESIUM HYDROXIDE—Medical, Powdered, Paste.
MAGNESIUM OXIDE—Light, Heavy, U.S.P., Technical.
MAGNESIUM SILICATE—Lo-Micron, U.S.P., Ground, Fibrous.
MAGNESITE—Powdered.
MAGNESIUM STEARATE—Powdered.
MARBLE—Powdered, Granular.
MAGLITE M—Magnesium Oxide for Neoprene.
MICA—Water and Dry Ground, Scrap, Block, Sheet.
OCHRE—Domestic, French Type American.
OPTICAL ROUGE—White, Red.
PARIS WHITE—Powdered.
PHTHALOCYANINE BLUE (Aqualine, Regaline).
PLASTER PARIS—Common, Gauging, Dental, Orthopedic, Pottery, Casting.
PUMICE STONE — "VALENCIA" ALL AMERICAN—Powdered, Granular, Lump.
PYROPHYLLITE—Powdered, Lump.
QUARTZ—Powdered, Graded.
RED OXIDE—Pure Copperas, Venetian, Spanish.
REGALINE BLUE—Resinated.
ROTTENSTONE—Powdered.
ROUGE—White, Red, Black, Green.
SERICITE—Powdered, Micaceous.
SIENNAS—Raw, Burnt.
SILEX—Powdered, Granular.
SILICA—Sand, Quartz, Amorphous, Diatomaceous.
SLATE—Gray, Powdered.
SOAPSTONE—Powdered, Granular, Blocks, Air Floated, Lo-Micron, Crayons.
SOLAR SHADE—Green House Shading.
STEARATES—Aluminum, Calcium, Magnesium, Zinc, Barium.
STEATITE—Powdered, Block, (Lava).
STEARIC ACID—Impalpable Powder, Flake, U. S. P.
TALC—All Grades: U.S.P., Powdered, Lo-Micron, Fibrous, Steatite.
TERRA ALBA—Domestic, English.
TERRAZZO STRIPS
THOMASSET D & C COLORS
TITANIUM DIOXIDE — Purified, Cosmetic Grade.
TRIPOLI—Powdered.
UMBERS—Raw, Burnt.
VENETIAN RED—Powdered.
VIENNA LIME—Powdered, Lump.
VOLCANIC ASH—Powdered.
VOLCLAY—Bentonite, High Gel, Crushed, Air Floated, Granular, KWK.
WHITING—Chalk, Commercial, Gilders, Limestone, Precipitated, Natural.
YELLOW OXIDE—Natural.
ZINC OXIDE—U. S. P.
ZINC STEARATE—U.S.P., Technical.

QUALITY IS OUR FIRST CONSIDERATION

• For over fifty years, Whittaker, Clark & Daniels, Inc., a dependable source for minerals, colors and chemicals, have rigidly adhered to their slogan "Quality is our first consideration". This, with good service and satisfied customers, has placed us in the high position we occupy today.

A list of industries and professions served by Whittaker minerals, colors and pigments would fill a large book. Suffice to say, this comprehensive experience with all industry, this diversification and perspective, adds an immeasurable amount to Whittaker's ability to please YOU. Here are some who rely on Whittaker's high uniform quality.

Agricultural	Electric Plating
Cosmetic	Paint
Drug	Lacquer
Rubber	Glass
Foundry	Ceramic
Steel	Paper
Soap	Roofing
Chemical	Food
Floricultural	Optical
Insecticide	Monument
Metalworking	Printing Ink
Dentistry	Jewelry
Orthopedic	Instrument
Art	Medical
Leather	Porcelain
Electrical	Shipbuilding
Textile	Welding
Plastic	Steel Fabricating
Furniture	Construction
	Brick



WHITTAKER, CERAMIC MATERIALS

Aluminum Oxide
Antimony Oxide
Barium Carbonate
Bentonite
China Clay
Bell Ball Clays
Feldspar
Flint
Fluorspar
Fullers Earth
Ground Glass
Lime
Magnesium Oxide
Magnesium Carbonate
Calcined Magnesite
Crude Magnesite
Mica
Plaster
Pumice
Pyrophyllite
Rouge
Silica
Placing Sand
Stearates
Talc
Zinc Oxide
Chrome Green Oxide
Spanish Red Oxide
Red Iron Oxide

WHITTAKER, CLARK & DANIELS, INC.
260 West Broadway
New York 13, N. Y.

The Technical Service Department has prepared this small booklet on general information on ceramic products which are handled by Whittaker, Clark & Daniels for the information of their salesmen and sales agents. We feel that it may be of value to you in talking to customers and prospective customers for ceramic materials; that is, whiteware, glass and porcelain enameling manufacturers.

CERAMIC MATERIALS

(Whiteware, Glass and Porcelain Enameling)

ALUMINUM OXIDE - #607

This material is available in less than carload lots.

Aluminum Oxide is used to prevent pieces from sticking together during firing by electrical porcelain manufacturers and manufacturers of vitrified specialties. Steatite insulator manufacturers use Aluminum Oxide as a part of the body formula. Aluminum Oxide #607 will raise the softening or fusion point in the manufacture of crucible and specialized refractory materials

ANTIMONY OXIDE - #1616

Available in less carload and carload lots.

Antimony Oxide is used in glass as a decolorizer and refining material, and in porcelain enameling as an opacifier where it is generally incorporated in the frit. A new item in the W. C. & D. line and we do not have complete information available as to its complete use in ceramic manufacture. Salesmen should watch for potential customers.

BARIUM CARBONATE - #81

Available in less carload lots and carload lots.

Barium Carbonate #81 is a basic glaze ingredient used in practically all types of ceramic and glazed ware. It is used by glass companies to give special properties to glass and especially to optical glass. Manufacturers of heavy clay products such as bricks, drain tile, etc. use Barium Carbonate in small percentages to reduce the tendency of blooming. The amount used is approximately one-fourth of one per cent. This material is often used in talc bodies to widen the firing range, and is used as an auxiliary flux by whiteware manufacturers in body formulations.

BENTONITE - #49

Sold in less than carload lots and occasionally in carload lots.

Bentonite #49 is used to improve plasticity in art pottery, refractories, and heavy clay products. The amount used is generally under three per cent as Bentonite has a tendency to make casting difficult and also a tendency to throw off the fired color. Bentonite is an excellent suspending material used in minor percentages in formulations for glazes when required.

CHINA CLAY - #1353

Sold in carload and less than carload lots.

China clay is used in glass body formulations as a source of aluminum. #1353 is especially adaptable because of the small percentages of iron. Porcelain enamel formulators also use China Clay as a source of aluminum.

Manufacturers of whiteware, including art pottery, dinnerware, wall tile, use China Clay as a main body ingredient where the percentages used may go as high as twenty-five per cent. The average formulation use of China Clay in this type of ceramic manufacture averages about fifteen per cent. #1353 China Clay is recommended especially because of its fast casting characteristics and its excellent fired color.

Calcining tests show that #1353 China Clay has a better color at 1800°F. than any other Clay used in a similar manner, including English Clays.

We are having experimental work conducted by the Ceramic Laboratories at Rutgers University on this material, and because of our work along these lines, have a six-month exclusive contract to promote the sale of #1353 China Clay in the ceramic industry.

CHINA CLAY - #1431 and #1432

Sold in carload and less than carload lots.

China Clays #1431 and #1432 are used as a body ingredient in the formulations for art pottery, dinnerware and wall tile. It is used in a similar manner to the #1353 China Clay. The Ceramic Department of the University of Georgia are investigating the use of this Clay in all kinds of ceramic manufacture and will probably have some definite information on the use of China Clay #1431 and #1432 by the end of this summer. Whittaker, Clark & Daniels have had both good and bad reports on casting properties of these Clays.

CHINA CLAY - #41

Sold in less than carload lots.

China Clay #41 is used the same way as the previous China Clays and is the same as R. T. Vanderbilt's "Peerless" Clay.

#1353, #1431, #1432 and #41 China Clays are Georgia Kaolins.

CHINA CLAY, ENGLISH - #372

Sold in less than carload lots.

China Clay #372 is an English China Clay and is used in the same manner by ceramic manufacturers as are the domestic Clays but is preferred by some manufacturers because of the fired color of the material. Ceramic users buy English China Clay chiefly for vitrified ware.

"EPK FLORIDA" KAOLIN (CHINA CLAY) - #609

Sold in less than carload lots.

This Clay can only be handled by Whittaker, Clark & Daniels in less than carload shipments. It has much better plasticity than is exhibited by the previous described China Clays. This Clay is between a China Clay and a Ball Clay in respect to its plasticity characteristics and use.

Whittaker, Clark & Daniels, Inc,

CM-5-50

BELL BALL CLAYS

Sold in carload and less than carload lots.

Hard and fast rules for the use of Bell Ball Clays cannot be established, but in general pulverized Clays are used where a dry mixing process exists. Pulverized Clays are also used for plants making casting bodies who blend directly, eliminating a filter press operation. Crude Clays are used generally where filter pressing is used; that is, wet processing.

Another type of Bell Ball Clay, a controlled dry Clay for silo storage, is used by some large producers due to lower handling and freight rate charges.

General characteristics of Bell Ball Clays can be classified as follows: Dark Ball Clay is the whitest burning; Dresden is the strongest; and the Dark or Universal tend to be the best for casting.

Bell Ball Clays are shipped as specified in six grades. Dark, Dresden and Gray are straight Clay as mined. Universal, Superior and Special are blends of the above clays. All six of these clays are available in crude, controlled-dried or pulverized form.

The Crude contains approximately 20% moisture. It is never shipped direct from the pits. The Controlled-Dried contains approximately 10-12% moisture which is guaranteed according to customer specification. The Pulverized, which is an air floated clay, contains only hygroscopic moisture.

Karblite Ball Clay is a specially processed, pulverized clay to have guaranteed low lignite.

BELL BALL CLAYS

There follows a general suggested list for the industrial uses of Bell Ball Clays.

Art Ware -----	Dark Special
Glaze -----	Dark, Karblite
Enamel Ware -----	Dark, Karblite
Chemical Porcelain -----	Dark Dresden
Heat Insulators -----	Universal Dresden Dark
Crucibles -----	Dresden
Dental Porcelain -----	Dark, Karblite
Saggers -----	Sagger
Kiln Furniture -----	Dark
Stilts, Pins, General	
Refractories -----	Special
Dinnerware -----	Dark Dresden Superior
Whiteware -----	Dark
Hotel China -----	Dark Dresden Superior
Wall Tile -----	Special Dark
Sanitary Ware -----	Dark Special
Electrical Porcelain -----	Universal Dresden Dark Superior
Steatite -----	Dresden Universal
Terra Cotta -----	Gray

FELDSPAR - #181 and #330

Sold in less than carload lots.

Feldspar #181 and #330 are used by glass companies and manufacturers of porcelain enamel as a source of aluminum. The manufacturers of art pottery, dinnerware and wall tile, use Feldspar as a flux.

#181 Feldspar is a 200 mesh material and is the standard generally used. However, where maximum fluxing is desired #330 Feldspar, which is a 325 mesh material, should be suggested.

Some competitive materials are Nepheline Syenite, which is sold in this area by the EPK Clay Co. of Metuchen, N.J., Multi-Flux, sold by the Foote Mineral Co. of Philadelphia, Pa., and Uni-Flux sold by the Great Lakes Carbon Co. These competitive materials tend to have shorter firing range, greater warpage and poorer color than does Feldspar. The users of Nepheline Syenite are particularly liable to have warpage trouble and we suggest the use of #330 Feldspar as our offering to a prospective customer who is in this position.

FLINT - See Silica

FLUORSPAR - #157

This material is sold in less than carload lots.

For porcelain enamel manufacture, Fluorspar #157 is a source of calcium fluoride. Fluorspar because of its calcium fluoride content is used in glazes for increased fluxing characteristics. Fluorspar #157 is used in glass formulations as an auxiliary flux.

FULLERS EARTH - #699

This material is sold in less than carload lots.

Fullers Earth is used as an absorbent around motors and pumps in practically all plants for good housekeeping purposes.

GROUND GLASS

#718 - Sold in less than carload lots.
#374 - Sold in truckload lots.

Ground Glass is used in refractory coatings, art pottery and novelties as an auxiliary, low temperature flux. Ground Glass is desired by a number of customers but is not guaranteed as to uniformity of chemical analysis. This type material is currently used by several of our customers manufacturing bodies for hobbyists, and refractory coatings for furnaces and boilers.

LIME - #101

This material is sold in less than carload lots.

In the manufacture of glass, Lime is used as a source of calcium, acting as a flux with the silica used in the formulation. Whittaker, Clark & Daniels have this material available only in less than carload lots.

MAGNESIUM OXIDE - #310 MAGNESIUM CARBONATE - #690

These materials are sold in less than carload lots.

These materials are used in porcelain enameling formulations and in steatite insulators to increase the Magnesium Oxide content of the body. Sometimes used in glazes as an added source of Magnesium Oxide.

CALCINED MAGNESITE - #222 CRUDE MAGNESITE - #1320

These materials are sold in less than carload lots.

Magnesites are used in glass formulations as a source of Magnesium Oxide and are used in refractory specialties and refractory coatings to improve resistance to heat shock.

MICA - #279

This material is sold in less than carload lots.

Mica #279 is occasionally used in casting difficult shapes. The Mica is dusted on the inside of the molds to improve the release of the pieces.

PLASTER - #122

This material is sold in less than carload lots.

Plaster is used by all art ware, dinnerware and novelty companies.

PUMICE

This material is sold in less than carload lots.

Glass companies who cut sometimes use Pumice. Specifications on mesh sizes vary. Pumice may be suspended by Bentonite in a slurry.

PYROPHYLLITE - #16 and #29

These materials are sold in less than carload lots.

Pyrophyllite is used in art pottery, wall tile and dinnerware formulations to control shrinkage. #16 has a better fired color than #29 but due to the small amount of Sericite in its analysis, it is sometimes found objectionable. Pyrophyllite #16 and #29 are used in refractory materials to improve the resistance to heat shock and also to control shrinkage factor. Pyrophyllite does not wet readily and is therefore difficult to use in a casting body. Pyrophyllite is the only ceramic material that expands with firing and thus it is used to counteract shrinkage of the other ingredients.

ROTTENSTONE - #120

This material is sold in less than carload lots.

Rottenstone is used by some glass companies to polish glass after cutting.

ROUGES - RED AND WHITE

Sold in less than carload lots.

These materials are used by plate glass and flat glass manufacturers for polishing.

SILICA - #213 and #219

This material is sold in less than carload lots.

Silica is used as a body ingredient in art ware, dinnerware, wall tile, floor tile, sanitary ware, etc. formulations. It is a body ingredient in this type of ceramic work and oftentimes is as much as 35% of the total formulation.

Silica #219 is finer than Silica #213 and is therefore somewhat more reactive. As a note of information, too much Silica in a ceramic formulation causes shivering and dunting. These are the opposite effects of crazing.

PLACING SAND (SILICA) - #284

Sold in less than carload lots.

This type of material is used in the bottom of saggars to prevent the ceramic ware from sticking. The general requirements are for a coarse sand of this type, and the material is used over and over.

STEARATES - #906 Calcium Stearate
#1345 Calcium Stearate
#905 Magnesium Stearate
#904 Zinc Stearate

These materials are sold in less than carload lots.

Manufacturers of steatite insulators and ferro-magnetic cores use metallic soaps to improve the pressing properties of their product. The grade of Stearate used depends upon the individual customer's specifications.

TALC

Sold in carload lots and less than carload lots.

The ceramic industry as a whole consumes large quantities of Talc. The Talcs selected find their place because of their various chemical and physical properties.

Manufacturers of steatite insulators require Talcs of low iron, low lime and low aluminum content, and the Talc must have good dielectric properties. Whittaker, Clark & Daniels' Talcs #1439, #1729 and #1730 are excellent for these purposes. W. C. & D. Talcs #486, #1286 and #1211 are also widely used by steatite insulator manufacturers.

Ceramic heat insulators, refractory ceramics and kiln furniture require a Talc low in iron and low in lime, but with some aluminum content to give maximum resistance to heat shock. Whittaker, Clark & Daniels' Talcs #11, #481 and #486 are found most useful in this type of formulation.

Art pottery and dinnerware require Talcs that have good casting characteristics, and should have some calcium in the chemical analysis to give good fired color. Whittaker, Clark & Daniels' Talcs #463, #610, #783 and #786 are all excellent for this type of formulation. These Talcs are also suitable for wall tile formulations. Talcs as a whole increase the resistance to heat shock, improve the glaze fit, decrease the tendency to craze and improve the electrical properties of ceramic formulations.

The percentage of Talc used in ceramic formulations vary from 5% to 90%. In general, steatite insulators are made with approximately 80% Talc in their composition, wall tile formulations carry approximately 40% Talc, and dinnerware and art pottery ceramic items will contain approximately 15% Talc.

Several of the Talc items which are handled by Whittaker, Clark & Daniels are used outside of the previous recommendations. #5 Canadian Talc is used by some art pottery manufacturers but is not recommended for this purpose by Whittaker, Clark & Daniels

because the calcium content cannot be guaranteed. Our #13 Fibrous New York State Talc is not recommended by us for use in the ceramic industry because of the selling arrangement existing between the W.H. Loomis Talc Corp. and Donald Hagar. #160 Maryland Talc is used in sizable quantities for saggers where the iron content is not important.

WHITING (CHALK)

Sold in carload and less than carload lots.

Whitings are used as an added source of calcium and also as an auxiliary flux, and generally the customer has preferences as to the type of Whiting he will use. A large number of ceramic manufacturers still prefer English Chalk Whiting #62 because of its established reputation for purity. A dry ground Whiting such as W. C. & D. #629 is largely used as a domestic grade and has proven acceptable by many manufacturers.

ATOMITE #319 is used where fine particle size is most desirable.

Whiting is used in glazes as a flux and is particularly desirable in pinks. The specifications of purchase vary accordingly to the preferences of plant ceramic engineers.

ZINC OXIDE - #1429 and #956

Sold in less than carload lots.

Zinc Oxide is used in glass as an opacifying agent. It is a common ingredient in glazes, especially if a crystalline effect is desired. Zinc Oxide #1429 is used in ferrite magnetic cores.

CHROME GREEN OXIDE - #513

Sold in less than carload lots.

Chromium Oxide is used to give green ceramic colors and when combined with tin oxide to give pinks. Chromium Oxide is used in some refractory coatings to raise the melting point.

SPANISH RED OXIDE - #587

Sold in carload and less than carload lots.

This material is used by some ceramic manufacturers as a source of iron oxide. Spanish Red Oxide fires to soft yellow and brownish red colors.

RED IRON OXIDE - #2594

Sold in carload and less than carload lots.

The use of Pure Red Iron Oxide #2594 varies widely as it is mainly for color purposes. This material is also widely used in ferro-magnetic cores as a major body ingredient.

