



## From Dust to Dust

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Belden Brick Company began in Canton, Ohio in 1885, and was originally known as the Diebold Fire Brick Company. Today they boast 9 brick manufacturing plant locations throughout Ohio, Maryland, Pennsylvania and Connecticut, including plants acquired from Redland Brick, Inc., the U.S. subsidiary of Redland PLC. Belden Brick is a family owned corporation, currently run by the fourth generation of Beldens. Total capacity for all plants is more than 390 million brick annually, with over 750 employees. Known as the industry's quality leader, "The Standard of Comparison" in the field, Belden Brick demonstrates an excellent history in their cycle of operations from open pit mining, to recycling, and following through with land reclamation.

Their newest brickmaking facility in Sugarcreek, Ohio is scheduled to be ready by August 2000. *"It will be a state-of-the-art brick manufacturing facility, said Shauna Ross, Environmental & Safety Technician, "with an annual capacity of up to 45 million brick. By the beginning of the third quarter of the year 2000, Belden Brick expects to consist of seven plants in the Tuscarawas County operating 11 tunnel kilns and 20 periodic beehives. "* With productions projecting over 250 million brick from these alone, Belden in Tuscarawas will employ over 500 people. In comparison, Redland Brick's three plants: Cushwa Plant in Williamsport, Maryland, Harmar Brick in Cheswick, Pennsylvania, and KF Brick in South Windsor, Connecticut, operate with a total capacity of approximately 140 million brick with nearly 250 employees.

Belden's open pit mining operations consist of: drag lines, power shovels, front end loaders, drill rigs, pit trucks and over the highway trailers. The majority of their pits have clay deposits close to the surface. Operators work five useable veins of shale, and clay that are used to manufacture many colors of brick, each requiring fireclay blends, shale blends, & fireclay & shale blends. Even though other raw elements are found during these mining operations, the company seeks to put as many of the materials to use as they as can. Recycling and blending techniques are a couple of ways Belden Brick makes use of raw materials.



- **Recycling is a major operation**

A major goal of Belden is to recycle waste. Since the usage of raw materials mined from open pits depends upon customer product demands, extraneous materials are sold to local businesses. What are their extraneous materials? Seams of coal, limestone & sandstone that are encountered during mining operations interspersed throughout the veins of shale and clay are left over. These seams are not necessary for manufacturing their brick products, so they're up for sale.

*"It's not the Belden Brick Company's practice to throw away any material that may be put to good use either by us or another company,"* said Shauna.

- **Environmental Impact**

Belden maintains stewardship with the air, land & water. A goal is to reduce their impact on the environment and human health to the lowest practical minimum. Belden Brick takes great pride in their product quality and adapts environmentally responsible practices throughout their operations.

*"The Belden Brick Company Quality Management System was certified as compliant with the ISO 9002 requirements for the Internationally Recognized Standard for Quality Management Systems in 1994,"* said Shauna.

Caution is used in the disposal of waste products. In the meantime, plans continue to be developed to reduce waste levels and enable beneficial re-use of waste.

- **Raw Material Testing**

A unique balance of raw material blends is important part in the brick manufacturing process. Since shale and clay are not of uniform structure throughout the various depths in the earth, elemental characteristics change – fired sized shrinkage, carbon burnout and forming plasticity. Reclassification needs to be performed throughout the various stages of acquiring these elements to maintain industry product requirement standards. This is done through weekly tests performed in the pits. A portable test kiln placed in one of these pits can determine the status of materials in as little as fifteen minutes.

## ● Raw Material Blending

In order to minimize scrap loss amongst these various consistencies tested in the pits, up to 7 different materials are blended- three different shales, four different clays.

*"Each material is essentially alike except for the iron oxide content. Shale consists of 8-9%  $Fe_2O_3$  and burns red (iron oxide is rust, rust is red and so bricks red). Clay known as fireclay consists of 2-3% iron oxide and burns to a light cream color, because the iron oxide acts as a flux on the silica component of the clay,"* said Garrison F. Finzer, Superintendent of Sugarcreek.

Each material is mined and processed "to its final particle size" separately, then mixed or blended in controlled proportions, depending on the colors required. Manganese dioxide can be added to produce a tarnish gray in fireclay, deep red or dark purple in shale, or shades of brown in shale / fireclay mixtures. For blue-gray in fireclay and orange in mixtures, chrome-oxide is added.

Thus by blending to utilize as much raw material as possible, waste is reduced. In addition, blending helps in the diversification of Belden's product line. One extra benefit: this process greatly aids in matching previously constructed buildings.

## ● Reclamation

Belden Brick has an excellent history of reclamation of the lands. Water from mining operations is entrapped; sediment, pH and dust are controlled. Loading shovels replace blasting.

Claims to fame on used land boast a Central Maintenance Facility, a high school football stadium, a Community Park, baseball diamonds, a housing development, a sportsmen club, a trapshooting range, and a community softball field. With over 100 years in the brick industry, including survival during wars, financial panic, new governmental regulations, and market changes, Belden Brick Company mines resources from the earth, but definitely gives back – from dust to dust.



For more information on Belden Brick including on-line versions of many Belden Brick publications for printing: The Great American Home, Special Shapes, Belden Pavers, and The Belden History

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