THE
LOW-SET™
BRICK MAKING PROCESS

BY

SWINDELL
DRESSLER
WHAT IS THE LOW-SET™ BRICK MAKING PROCESS

The LOW-SET™ brick making process is designed to reduce operating costs by optimizing:
- Setting
- Drying
- Firing
- Unloading

The LOW-SET™ process uses a setting height of only 3 or 4 brick high (edge set) compared to a conventional setting height of 10 to 14 brick.

The LOW-SET™ package can be set and unloaded with simpler, less costly machinery and can be dried faster using less energy. Also, the LOW-SET™ package can be fired faster with better temperature uniformity, more uniform flashing and reduced firing losses.

To facilitate the LOW-SET™ process, Swindell Dressler has developed a very special kiln car as shown in Figure 1 and Figure 2. This kiln car is extremely lightweight using fiber insulation which protects the steel frame of the car and hollow posts, beams and rods which support the load. When required the fiber can be covered with hollow cordierite perimeter blocks and cordierite cover slabs. These kiln cars can be made extremely wide which reduces the overall length of the tunnel kiln and dryer. The LOW-SET™ brick making process is designed to operate 7 days per week, which minimizes the number of kiln cars required and minimizes the size of the plant. (Process covered by U.S. Patent No. 4773850)

Figure 1: LOW-SET™ setting with 3 brick high.

Figure 2: LOW-SET™ setting with 4 bricks high

Benefits of the LOW-SET™ brick making process
- Dry and fire in 1/4 of the time
- Simpler, less expensive setting and unloading machinery due to low stable loads
- Reduced manpower, with as few as 3 people per shift
- More uniform temperature improving physical properties
- More uniform flashing
- Negligible kiln car refractory maintenance cost.
- Bottom course deformation eliminated and recovery approaching 100%
- Reduced HF emissions – reduces need for a flourine scrubber
- Product to product transition losses reduced by 90%
- Reduced total inventory requirements and improved service due to fast cycles
- Energy cost for week-end or vacation shutdowns greatly reduced
- Flexibility

The above benefits reduce the total manufacturing costs ($/1000 brick)
TYPICAL LOW-SET™ PLANT FOR 40 MILLION BRICKS PER YEAR

Kiln Car Width: 16.5 Ft (5M)
Building Size: 50,000 Sq. Ft. (4600 M²) (Grinding area not included)
Man Power Required Per Shift: 3 (Grinding not included)
Electric Consumption: 32.5 KWH Per Ton Produced
Fuel Required: 700 BTU/Lb. Product Produced (350 Kcal/Kg)

Figure 3: Plant layout based on one shift per day seven days per week and a four high setting. Firing cycle 12 hours and drying cycle 14 hours.
Robots compliment the flexibility of the LOW-SET™ brick making process

Robots allow cross setting on a LOW-SET™ car. This enables the LOW-SET™ kiln to replicate products from existing conventional height kilns.

Robots can be easily re-programmed and re-tooled to produce future products.
The LOW-SET™ Dryer System Minimizes Horsepower With The Use Of 1.5 HP "Ceiling Type" Recirculating Fans.

The LOW-SET™ dryer system is designed to take advantage of the low setting height which allows up and down air flow through the load with use of recirculation fans. These type recirculation fans are very low maintenance because bearings and motors are outside the dryer. The dryer is designed to direct air through the load into the plenum located between the brick and the base of the car. The air then rises up through the load to the recirculating fans while flowing toward the entrance end of the dryer. The continual up and down motion of the air allows for uniform drying of the brick. This air flow pattern is shown in Figures 5 and 6.

Figure 5: Dryer air flow pattern

Figure 6: Twin tunnel Dryer

A twin tunnel dryer is normally used to save plant floor space as shown in Figure 6. Figure 7 shows a car exiting the dryer.

Figure 7: Car exiting Dryer
The **LOW-SET™** Tunnel Kiln System Uses A Unique Firing Arrangement To Uniformly Heat The Very Low, Very Wide Load  

(Design covered by US Patent No. 5667378)

The **LOW-SET™** tunnel kiln has a cross section with a setting width 10 to 20 times larger than the setting height. Figure 8 shows a typical cross section view in the preheat zone. This unique kiln geometry favors top firing with continuous push as opposed to top firing with index push and fire lanes.

Figure 8: Cross section through the preheat zone showing alternate flat set pattern

To accomplish top firing without fire lanes, Swindell Dressler has developed a unique patented firing arrangement with burners firing through the load from the top. The high velocity roof burners entrain six times the volume of burner input; so that for every 1 cu. ft. of heating gases supplied through the burners, 6 cu. ft. of kiln gases are recirculated. This recirculation creates excellent temperature uniformity through the load.

Figure 9 shows the exit end of a **LOW-SET™** tunnel kiln. This kiln has a 3-brick high setting.

Figure 10 shows a typical control room with a computer-controlled system.
Worldwide Commitment
To Quality

Customer service, turnkey kiln and plant packages, clay testing, and more. These are the ceramic solutions we offer structural clay manufacturers anywhere in the world.

We're ready to design and build kilns and plants to handle any of your structural clay needs, whether you fire brick, hollow clay block, roofing tile, pavers, clay sewer pipe, or other products.

Our solutions improve firing time and reduce fuel costs. This means faster delivery of your product to your market.

Customers in Europe, Africa, Asia, Australia, as well as North and South America, are now enjoying the benefits of efficient, reliable Swindell Dressler technology. Shuttle or tunnel kiln, new plant or revamp - our goal is to meet your needs.

Swindell Dressler. We build creative ceramic solutions that keep customers satisfied. Contact our sales department at 412/788/7100 or Fax 412/788/7110.

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