ADVANCED DRYING
FAST – EFFICIENT – SAFE

ROTHO®

ALWAYS ONE STEP AHEAD

TRADITION + INNOVATION = COMPETENCE

Four generations of the family firm ROBERT THOMAS have continued the tradition of the German, Siegerland metal industry. At the beginning of the last century, the founder of our company, Robert Thomas, began manufacturing tools for the local construction industry. Over the generations, the production program has expanded to include thin sheet products for storage and transportation such as boxes and containers as well as transport vehicles for a wide variety of uses.

Now, four generations later and active in the ceramic industry for more than 50 years, ROTHO is the trademark for an internationally renowned drying technology. It is the leading producer of metal supports for your green products.
ROTHO innovations include such product developments as Quick Point, QUATRO dryers and XStream:

- ★ Founded around 1900
- ★ Traditional family business in its 4th generation
- ★ High integrity
- ★ Innovative and qualified engineering
- ★ Knowledge through experience
- ★ Production location in Germany
- ★ Leading manufacturer of metal support units for green products
- ★ Trend-setting solutions for clay brick and tile drying
- ★ Long-standing, solid business relationships, shaped by a personal atmosphere

Quality · Engineering · Design · Production
ROTHO
MADE IN
GERMANY

ROTHO sees itself as a team which develops and realizes, in close cooperation with our partners from the ceramic industry, perfect product and system solutions. The ROTHO development and design engineering teams for drying systems stand for consequent development of innovative solutions for drying systems and trend-setting solutions.

The production in our plant in Germany guarantees a high quality standard and a great flexibility. The know how of the ROTHO assembly team, obtained through decades of experience, offers a secure foundation for professional and trouble – free planning and construction at your factory, worldwide.

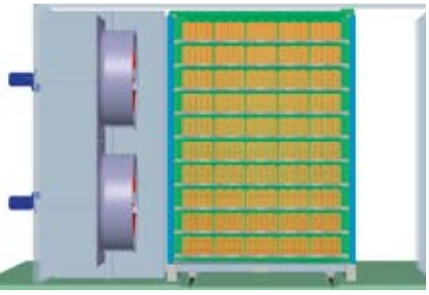
Decades of production development stand for the closest links to the ceramic industry and the ability to set trends, to create innovative ideas and to convert these into clear competitive edges for ROTHO custumers:

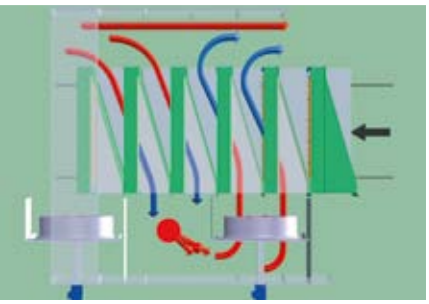
1950 to 1990:	• First metal support units for the clay brick industry • First metal support units for roof tiles • First chamber- and continuous flow dryer systems • First reverse support units for roof tiles
1998:	• QUATRO® dryer
2002:	• QuickPoint® plug-in system for roof tiles
2005:	• Quick dryer XStream for roof tiles
2007:	• STABILO ECK for clay brick plates
2008:	• Rotary fan ROTHO Mix Air
2009:	• Quick dryer XStream for clay bricks • Low-energy dryer EcoDry

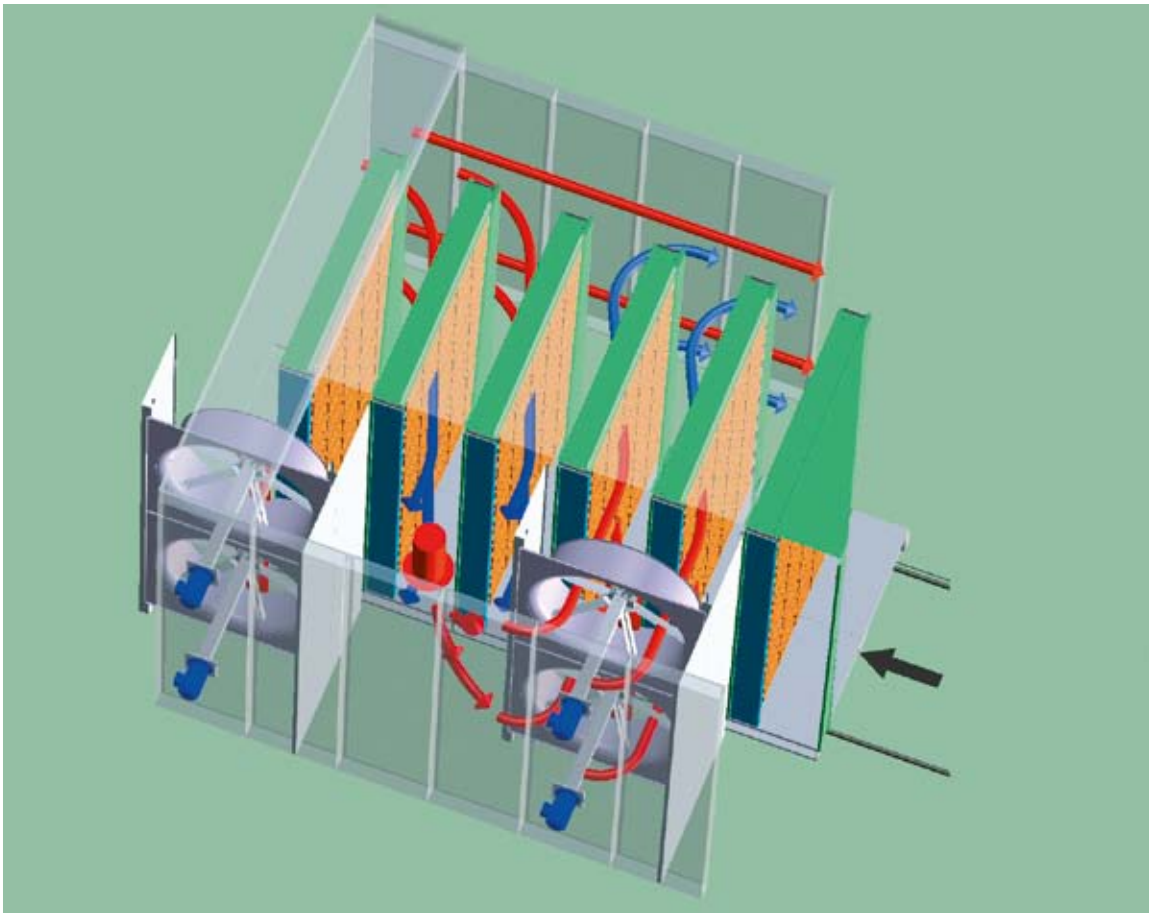
On the following pages you will find:

ADVANCED DRYING

ROTHO XStream *Brick*







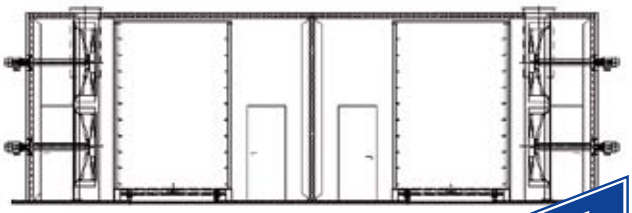
Reduce costs, improve capacity, save time

For many years, ROTHO has intensely been occupied with the quick drying of bricks. Shorter drying times are possible only if internal stresses resulting from differences in shrinkage are reduced. Therefore, quick drying also stands for a more gentle drying. Due to higher mass and heat transfer, quick drying also reduces energy consumption.

As a result of extensive fundamental research, the ROTHO quick drying concept has been further developed and is now ready for use for clay blocks and facing bricks with the designation XStream *Brick*. Quick drying is achieved by optimum flow profiles for the different brick types and the individual treatment of every single brick.

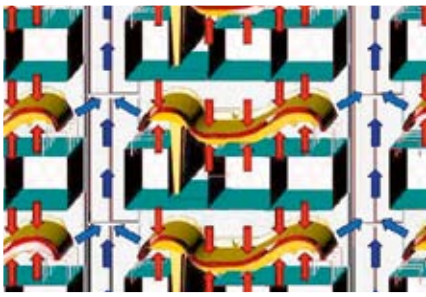
For this purpose, clay blocks and facing bricks are deposited at a cross angle to the advance direction on drying support units in drying cars. In this process, the single layers of bricks are positioned to optimize flow both through and around the clay body.

For an equal flow distribution, ROTHO XStream *Brick* uses dryer cars with integrated baffle plates. Thanks to the compact arrangement of the bricks, the XStream *Brick* requires only half of the construction area compared to other quick dryers.



PATENT PENDING

ROTHO XStream *Tile*



High efficiency and energy saving

For some years, XStream *Tile* quick dryers have been in use for standard and accessory tiles. For an optimum inflow, the roof tiles are deposited on stackable support units for green products with integrated ventilation ducts. Thanks to the gentle drying with impinging jet flow, even problematic roof tile models can be produced in the shortest time, whilst retaining the highest quality level.

Whether clay blocks, facing bricks or roof tiles, every single brick gets an optimum individual treatment in the XStream quick dryers. Thus, XStream quick dryers are very compact and feature low energy consumption.

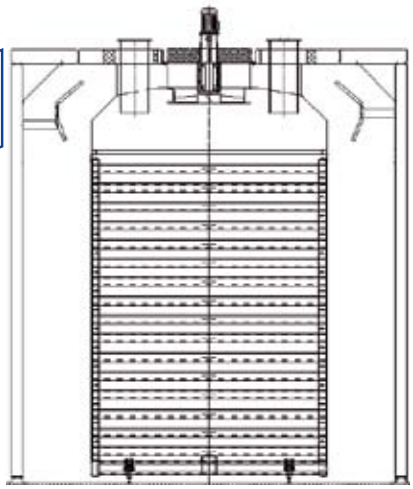
ADVANTAGES OF XSTREAM QUICK DRYERS

- Considerably lower investment costs
- Up to 20 % lower operating costs
- Up to 60 % lower space requirement
- Reduction of drying times up to 90 %
- Constant and even treatment of all green products
- Special treatment of sensitive tile areas
- Better drying of sensitive products

Drying without additional energy?

Up to the 1950s, tiles had been dried in open-air dryers without additional energy. Today, approximately 50 to 75 % of the total consumed heat energy is used for drying.
The EcoDry drying system developed by ROTHO uses, as far as possible, ambient air and requires – depending on ambient conditions – less than 30 % of the usually consumed heat energy for drying.
The trend-setting EcoDry low-energy dryer is also based on the XStream quick drying technology.

PATENT



VENTILATION SYSTEMS – THE BEST SOLUTION FOR EVERY PRODUCT

ROTHO AirWall

Air walls – Reversible air intakes

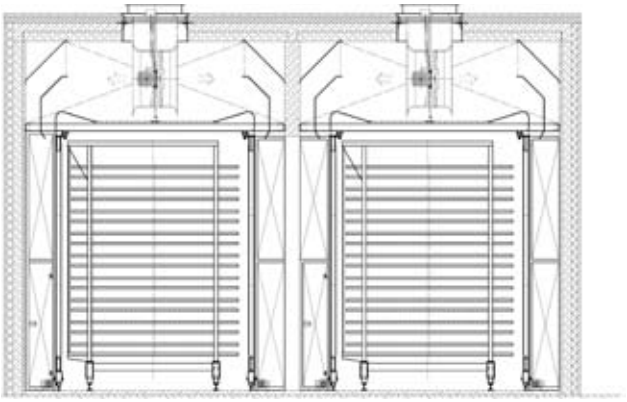
For products with short drying times such as roof tiles and clay blocks, various types of air wall dryers have proven to be effective.

Whether with vertical or horizontal air inlet slits, mobile or stationary, or as stackable support units for green products with integrated air inlet slits, ROTHO always finds the optimum solution for your specific application.

For standard roof tiles, usually dryers with a horizontal air wall are proposed. Multi-perforated air walls have proved especially easy to install and mechanically stable. For accessory tiles and clay blocks with filigree hole patterns, mostly dryers with mobile, vertical air inlet slits are used.

PRODUCT ADVANTAGES:

- Flexible dryer widths and air speeds
- Minor stream shadows
- Less drying time and higher quality thanks to reversible air intakes



ROTHO
MixAir

Rotary fans – Energy-efficient and universally applicable

As in almost every field of the ceramic industry, rotary fans are used for air circulation. An analysis of the ROTHO research department showed that there is still considerable potential for a more efficient application of this technique. The ROTHO MixAir® rotary fan combines new and proven solutions in a single unit:

- Fan wheel/guide wheel combination
- Air distribution drive with angular rotational speed
- Low-energy motor
- Newly designed fluidic air distrubutor

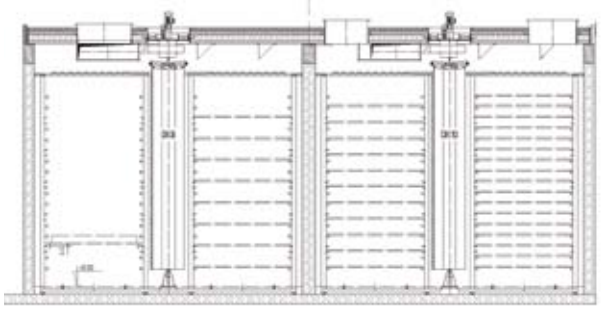
PRODUCT ADVANTAGES:

DRIVE:

- Up to 25% lower energy costs without loss of recirculation capacity
- Fast and gentle drying thanks to controlled rotary speeds of the air distributor
- Robust and easily maintained

AIR DISTRIBUTOR:

- Exceptional uniform air velocity over the entire height
- Large jet range
- Adjustable guide vanes



ROTHO QUATRO®.
THE PROVEN DRYER BUILDING SYSTEM.

Quick assembly – safe drying

Since introduction in 1988, approximately 50 ROTHO QUATRO® dryers have been successfully commissioned.

PRODUCT ADVANTAGES:

- Small stored heat
- Thermal-bridge-free construction
- High tightness
- High temperature resistance: standard design up to 150°C, custom design up to 250°C
- Removable and reusable
- The entire surface of the ceiling covering is accessible and mechanically highly stress resistant
- High corrosion safety / condensation free internal surfaces
- Quick assembly
- 5 years warranty

PATENT

The QUATRO® system is composed of independent internal dryer cases. These are formed by self-contained wall and ceiling boardings. All connecting branches for conduits, etc., are constructed at our works. The spaces between the internal chamber cases and to the outer casing are filled completely thermal-bridge-free with insulating material. If necessary, an insulating structure for the floor is provided. QUATRO® guarantees a trouble-free regulation of the drying process at all times.

QUATRO® variants

The QUATRO® system is designed for all types of dryers and can be supplied with a building height of up to 10 m. The ceiling boards are self-contained with a span of up to 11 m. In case of considerable loads applied on the ceiling, a light-weight supporting construction within the building is used. The standard QUATRO® system is dimensioned for usual loads arising from assemblies and superstructures. Additionally, a working load of 150 kg/m² is admissible. The ceiling covering consists of highly stressable plates and its total surface is accessible. QUATRO® is compatible with all current ventilating systems.

QUATRO® insulation

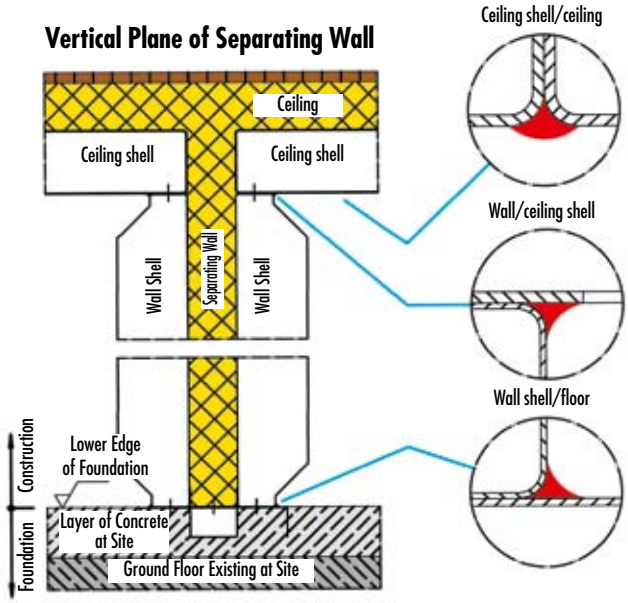
The thermal-bridge-free building system guarantees an optimum insulation: k-value 0.4 W/(m² K). An internal temperature of 150°C leads to an external temperature of only approximately 7°C above the ambient temperature in the standard execution. The insulation consists of bend-resistant, hydrophobed mineral insulating material.

ROTHO QUATRO®

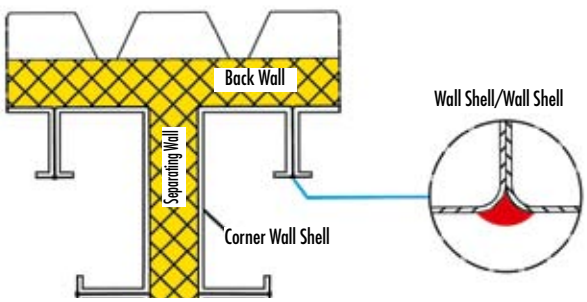
Assembly and sealing system

- Efficient and quick assembly thanks to pre-fabricated components
- The complete dryer is assembled by screwing the shells together successively
- All sealing is carried out after aligning and fastening of the complete building
- Our building system guarantees a perfect rigid and sealed structure
- The flange connections form an ideal joint to receive the permanently elastic sealing material
- All sealing surfaces are inside the dryer and, thanks to their free accessibility, guarantee a safe seal, which can be checked at any time
- The special corner wall design eliminates all sealing problems in the corners of the dryer

Vertical Plane of Separating Wall

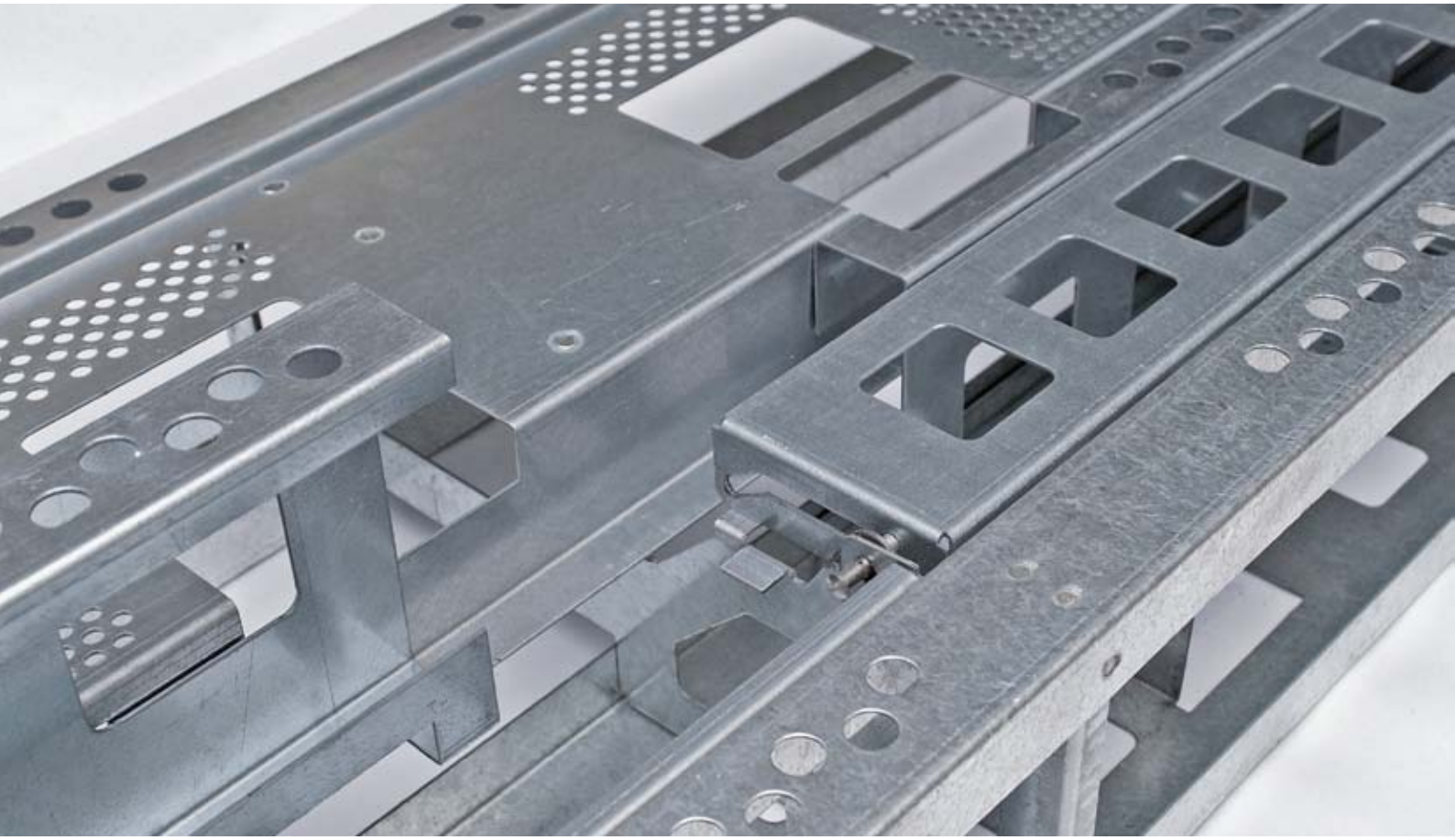


Horizontal Plane of Back Wall/Separating Wall



ROTHO DESIGN FOR ROOF TILE SUPPORT UNITS. OPEN, LIGHT, DURABLE AND ECONOMIC.

ROTHO DESIGN *Tile*



Single frame or support unit – The individual standard

More than 1.5 billions roof tiles are dried every year on ROTHO drying support units.

PRODUCT ADVANTAGES:

- Optimal design in cooperation with the customer
- Intense project monitoring based on decades of experience
- High air permeability
- Optimum economy of space for the maximum number of setting places
- High dimensionally stability at low own weight thanks to intelligent design solutions (SEC)
- Reduced load applied to the plant and lower heat absorption
- High precision of the supporting faces
- Optimum design of the supporting areas for different types of tiles

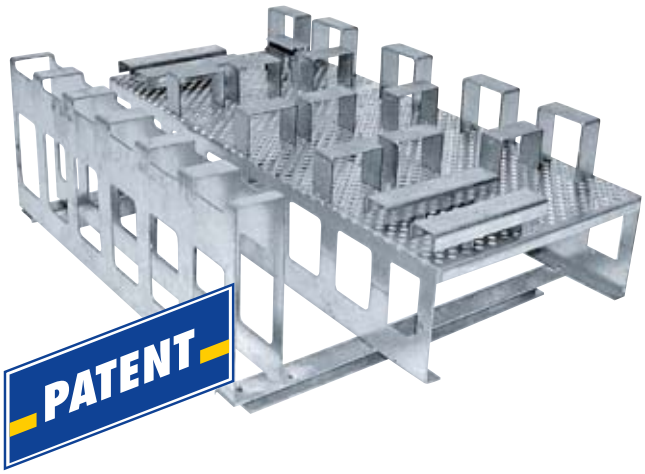
As the leading manufacturer of support units for the roof tile industry, ROTHO produces up to 100,000 support units per year. Each single project is handled individually and realized in accordance with the SEC (Save Energy Concept). The SEC principle is based on intelligent constructive solutions in sheet metal forming with the result that even with a low weight a high dimensional stability is achieved. Resulting in, reduced heat absorption of the roof tile support units and protection of the plant during its operation.

ROTHO QuickPoint®

QuickPoint® – Ready for new challenges

The supporting points, provided with a minimum support surface, provide the tile with the required distance from the basic board and thus allows the maximum aeration of the bottom surface of the tile.

The basic board with grid perforation allows the positioning of a supporting point at any place for the best tile support. With an adequate configuration it is possible to dry different types of tiles on only one support unit. QuickPoint® can also be modified at a later date for new types of tiles by simply pinning up or changing individual supporting points.



PRODUCT ADVANTAGES:

- Airflow to the upper side and bottom side of the tile
- Quick, even drying
- Individual sampling for drying tests
- Short delivery times
- Standardized system structure with minimized support points
- Possibility of later modification for additional models
- Suitable for all current ventilation systems

ROTHO DESIGN FOR BRICK SUPPORT UNITS. PROFILED, PROCESS-SAFE AND COST EFFECTIVE.

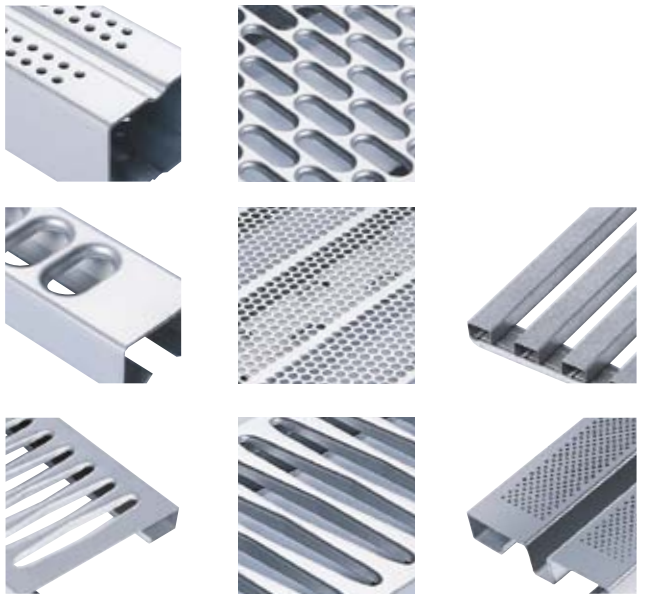
ROTHO DESIGN Brick

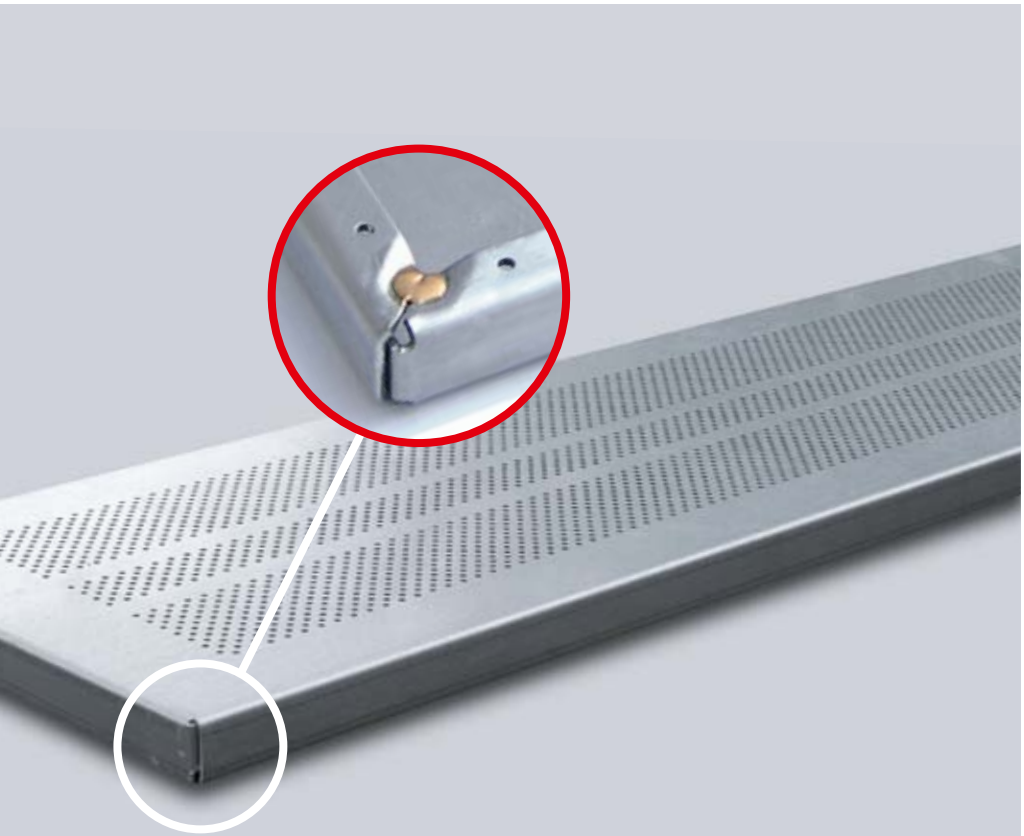
From the drying board to the large-format pallet – Always the right solution

Individual designs in form, surface design and size are the absolute standard for the ROTHO production program. Brick pallets, in many tried-and-tested design variations, offer an optimum weight/effective surface ratio (SEC) and constantly certified material quality. Large-format pallets for universal application in a wide variety of brick formats guarantee a long-lasting even surface in every design, thanks to the bend-resistant construction across both axis. More than 50 years of know-how in brick drying ensure competent solutions with an advantageous price/performance ratio.

PRODUCT ADVANTAGES:

- Different perforation systems for an optimum aeration
- From the cost-optimized basic version to tailored solutions
- Materials from galvanized to special steels
- Process-safe and dimensionally stable at low weight
- Reduced load applied to the plant
- Reduced heat absorption





STABILO ECK – The toughest of all pallets

PRODUCT ADVANTAGES:

- Robust
- Hard-wearing
- Durable
- True to dimension

ROTHO DRYER CARS.

A STRONG DESIGN

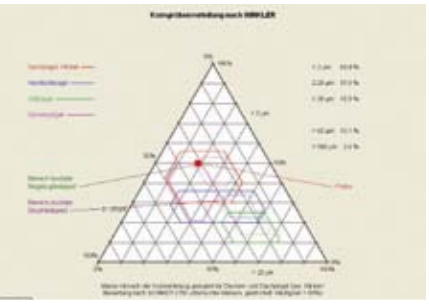
ROTHO dryer cars are designed for their individual application and are supplied both in light-weight execution and rolled sections. Depending on requirements, the surfaces of base frames and side plates can be serially or individually galvanized or coated.

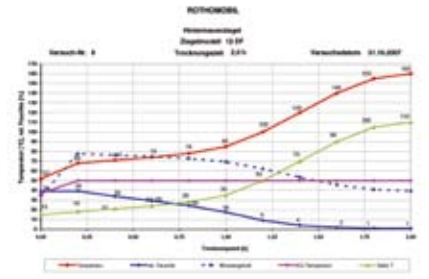
PRODUCT ADVANTAGES:

- High capacity
- High running precision
- Long lifetime
- Low weight
- Reduced heat absorption
- Low maintenance

ANALYSIS AND OPTIMISATION – THE DATUM

ROTHO Optimisation





On site consultation

ROTHO meets the increasing requirements for consultation services, not only by considering the optimum operation of existing dryers but also by regarding the well-founded design of new plants.

Objective:

- Improvement of product quality
- Reduction of energy consumption
- Performance increase

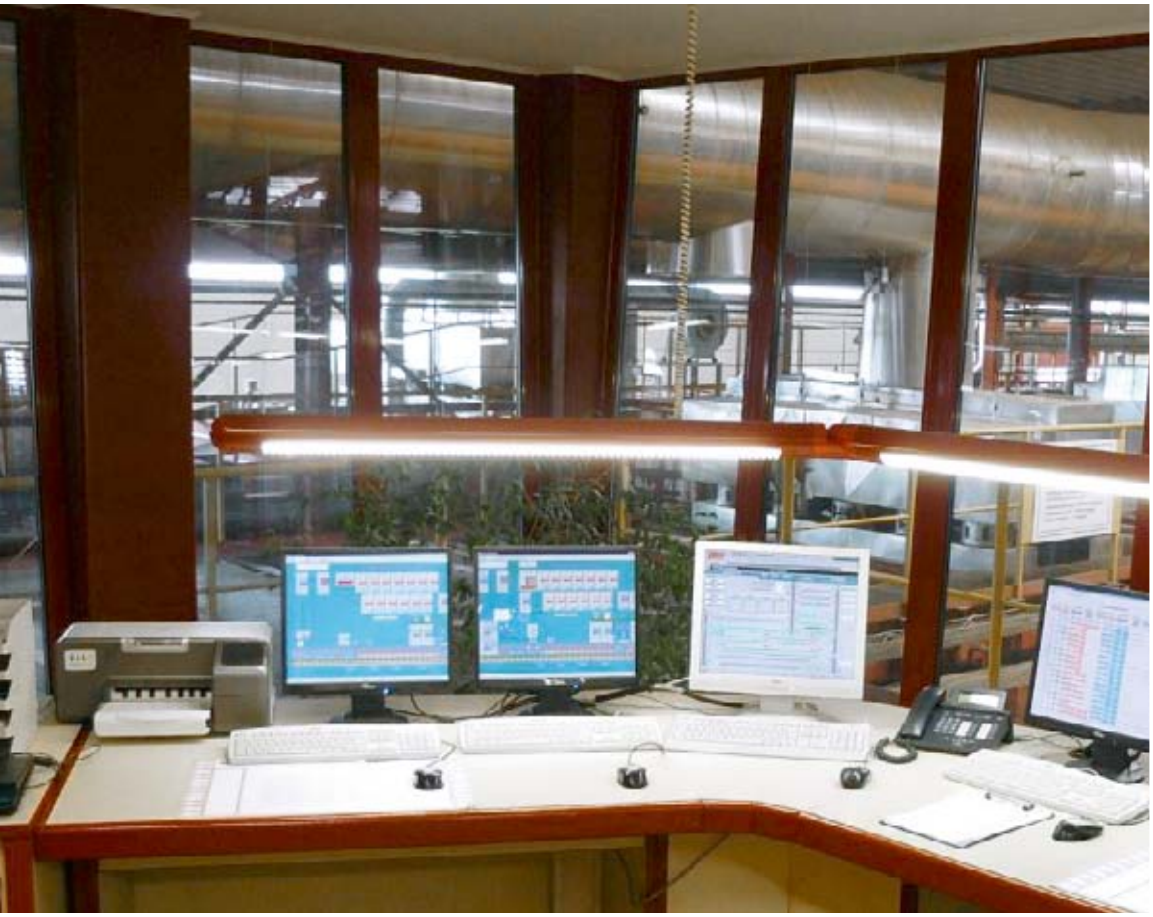
Additionally to the necessary ceramic knowledge of raw material suitability and the advantages and disadvantages of aeration and heating systems, the ROTHO team also possesses the practical experience in the production of roof tiles, clay blocks and facing bricks.

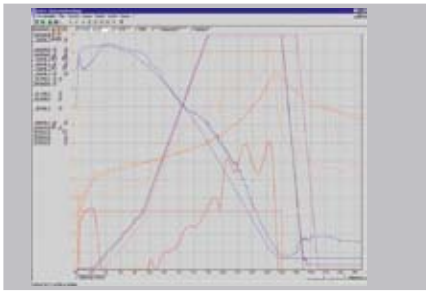
Objectives of our consultation are:

- Evaluation of raw material
- Optimization of raw material mixtures
- Preparation of achievable drying curves in the mobile test dryer
- Measurement of airflow profiles in the dryer cross section
- Running of new drying curves at the operating dryer
- Preparation of energy and mass balances
- Reporting of improvemets potentials at existing plants
- Selection of the optimum drying system for new plants

ROTHO AUTOMATION – SIMPLY FLEXIBLE

ROTHO Control





Intelligent process control

The intelligent process control systems of ROTHO optimize operations under changing operating conditions so that products with excellent quality can be produced constantly.

PRODUCT ADVANTAGES:

- Simple intuitive control of complex operations
- Process-oriented functioning
- Manifold control options

ROTHO control cabinets:

- Utilization type Siemens Simatice PLC
- Automatic preparation of the S7 software without requiring any programming knowledge
- Control via operator panel (as an option pilot systems)

ROTHO process control:

- Open user-defined configurable and parameterizable process system
- Definition of access authorizations
- Documentation of control operations, messages and alerts
- Graphic editor for product- and chamber-related drying programs
- Simple manipulation of running drying programs
- Graphic plant visualization
- Simple implementation of control strategies via module system
- User-defined temporal representation of all detected measurement and actuating variables
- Language selection

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Prof. Dr. Leisenberg GmbH+Co.KG

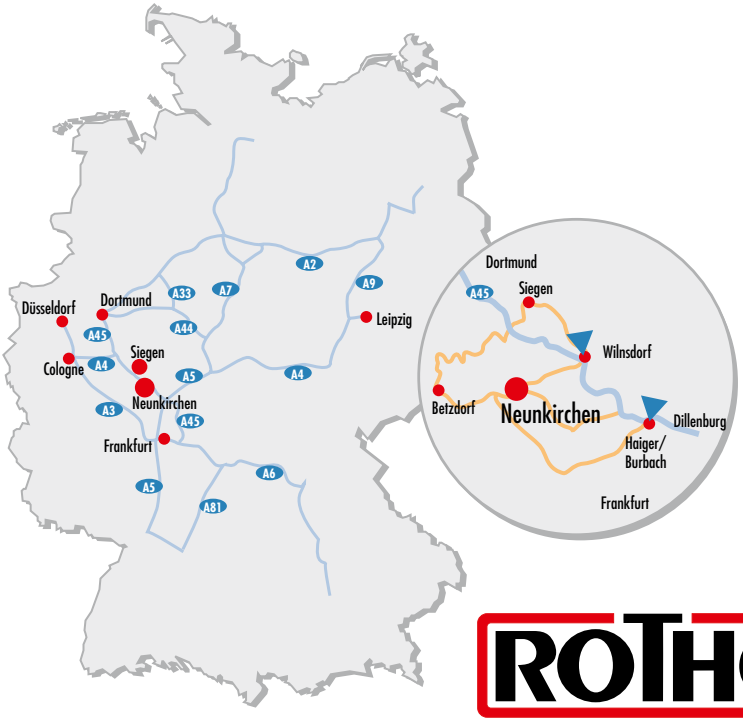
ROBERT THOMAS – MADE IN GERMANY
QUALITY PRODUCTS FOR MORE THAN 100 YEARS

Development and administration ROTHO, Neunkirchen

Headquarters / production ROTHO, Neunkirchen

Development and production THOMAS, Neunkirchen

Dispatch- and customer service center THOMAS, Burbach



ROTHO®

ALWAYS ONE STEP AHEAD

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