

German Kiln Technology

GKT

GERMAN KILN TECHNOLOGY COMPANY

German Kiln Technology GmbH (GKT) is an international specialist & manufacturer for kilns in advanced & technical ceramic markets. GKT has joined the market bringing with it a tradition of competence and skill.

GKT engineers with over 20 years of experience and know-how in the ceramic industry can focus all of its capabilities towards the development of outstanding solutions for the sophisticated requirements of its clients in the complex market of technical & advanced ceramics.

We provide turnkey solutions for continuous and intermittent kilns, the technology of high-temperature thermo processing, computerized control and automation technology for your products.

Working with our customers we find solutions which correspond exactly to their requirements. While unravelling the details, one has the potential to unearth ideas that result in revolutionary advancement.

We consider our customers as partners-in-business and believe this to be the basis of your and our success.

The GKT range of continuous & intermittent kilns is extensive e.g.:

▲ CONTINUOUS KILNS

- Tunnel kiln - to 1850°C
- Roller hearth kiln - to 1650°C
- Belt conveyor kiln - to 1100°C
- Pusher plate kiln - to 1800°C

▲ INTERMITTENT KILNS

- Shuttle kiln - to 1850°C
- Chamber hearth kiln - to 1850°C
- Bell type kiln - to 1850°C
- Lifting hearth kiln - to 1850°C





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Continuous Kilns

CONTINUOUS KILNS

▲ TUNNEL KILNS

**FOR FIRING REFRACTORY, SPARK PLUGS,
INSULATORS, GRINDING BALLS**

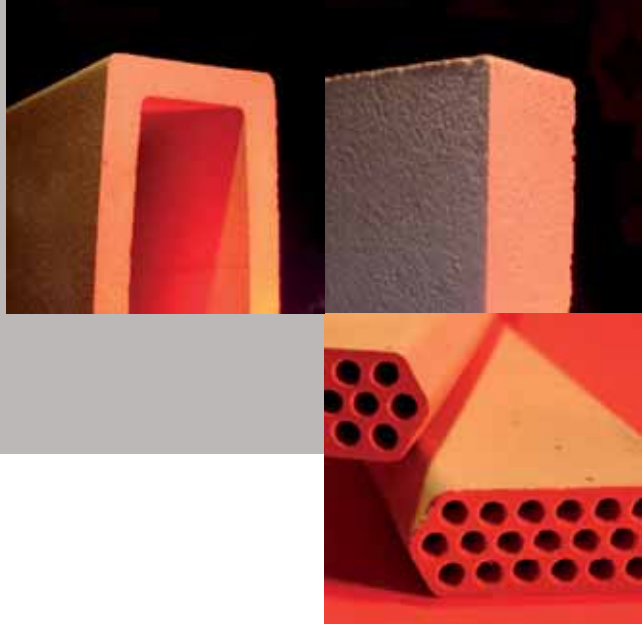
GKT tunnel kilns or other types of continuous kilns such as roller hearth or pusher plate kilns are mostly used in mass production with a long term application of the same or similar product mix.

Compared to intermittent kilns there is a huge advantage in fuel reduction.

The range of GKT tunnel kilns for the refractory industry covers sintering lines for silica, refractory clay, high alumina, zirconium, ceramic direct bound or rebounded magnesite, chromium magnesite, dolomite and magnesia spinel brick, magnesium calcium zirconium brick etc.

All GKT tunnel kilns are modular designed and constructed. Some types can be prefabricated and provide for safer transportation and fast assembling. High production output combined with the necessity of modern binder systems (high content of binder in the mass) is perfectly adapted to this type of kiln. Kiln length varies from 20 m to 200 m, firing temperature can exceed 1850°C.

The classical continuously working tunnel kiln remains an excellent choice for a wide product range such as refractory materials and spark plugs, insulators and grinding balls.





Intermittent Kilns

INTERMITTENT KILNS

▲ SHUTTLE KILNS

FOR FIRING REFRACTORY MATERIALS, ROLLER, INSULATOR, CATALYSTS, SUBSTRATES, OTHERS TECHNICAL CERAMICS

Intermittent kilns are exceptionally flexible and adaptable to a variety of product ranges. Their advantage is in economic sintering of the different products and loads. Shuttle kilns, allow for frequent change in firing cycles and load density for different products. These types of kilns facilitate mass production even with frequent changes in shape and size. GKT's intermittent kilns can be used for many applications and products. These kilns can be operated economically with different fuels as well as heated under oxidation, reduction or inert atmosphere.

We design these kilns specially for production of technical ceramics like: structural and electronic, Multilayer, Catalysts and filters for the automobile and chemical industries, Bioprothesis or high alumina Al_2O_3 and zirconium products as well as any kind of refractory like: silica, refractory clay, high alumina (Al_2O_3) and zirconium (ZrO_2), ceramic bound magnesite, chromium magnesite, dolomite and magnesia spinel brick, magnesium calcium zirconium brick etc. The firing temperature range is from $1000^{\circ}C$ to $1850^{\circ}C$. The effective volume for sintering starts at approx $1m^3$ and is not limited in larger constructions. As so far the largest plant has an effective setting volume of $180m^3$.



GKT intermittent kiln design incorporates a number of innovative solutions:

- ▲ Minimizing fuel consumption thanks to GKT high speed combustion system based on high velocity burners and application of secondary and / or preheated combustion air
- ▲ With pulse or modulate firing
- ▲ High temperature preheated combustion air to 600°C
- ▲ High level lining design for optimizing the fuel consumption, improving the temperature uniformity and saving cooling time
- ▲ Providing precise and flexible operation of the kiln and optimal product quality by microprocessor control system

GKT experts have many years of experience with ceramic rollers / pipes.

We are able to offer you a wide range of kilns in a flat roof design with useful kiln height up to 6.5 meters. GKT kilns with their own highly efficient burner system and sophisticated control system provide you:

- ▲ Low energy consumption
- ▲ Perfect temperature uniformity and excellent heat flow distribution
- ▲ Excellent atmosphere control during the firing cycle
- ▲ High productivity and constant quality of products



Special Kilns

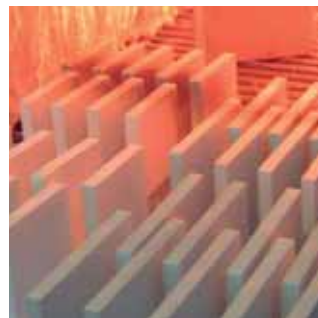
SPECIAL KILNS

▲ SPECIAL KILNS WITH INNERT ATMOSPHERE

For special products like ceramic beta alumina tubes glass with nickel or metallization of high alumina vacuum switches or other high performance technical ceramic that requires inert electrical firing, we at GKT, design our special kilns with inert atmosphere of air, N₂, nitrogen / hydrogen 95:5 % or argon. We choose the right atmosphere, depending on the product oxidation reaction and sensibility.

Our airlock sluice system guarantees a correct and a stable atmosphere. With our high performance transportation and conveyer system, we achieve an exceptional grade of automation.

If the requirement is to sinter ceramic sensor elements at 1400°C in an electrically heated lifting hearth kiln with SiC heater rods and IGBT technology in order to save energy and to improve the lifetime of the heaters, then GKT offer the right kiln to you. Our kilns are designed specifically for your product, individually, tailor made and according to your requirements. Fully automated loading and unloading stations are part of this comprehensive sophisticated kiln plant solution.



▲ ROLLER HEARTH KILNS FOR TECHNICAL CERAMIC OR GRINDING MEDIA

The roller hearth kiln, initially developed for table ware, is used now for more elaborate and diverse products. Compared to tunnel kiln, roller hearth kilns do not need the thermal indifferent kiln cars or the heavy lining and the large rail network. The resulting advantage is a considerably shorter firing cycle. Therefore by firing in single layers lower energy consumption can be achieved and less space is required.

Roller hearth kilns are built in modular construction with light brick lining. In addition to further energy savings, roller hearth kilns offer advantages for assembly.

For firing grinding balls, GKT provide both tunnel kiln and roller hearth kiln. Due to specific advantages compared with tunnel kilns, the market share of roller hearth kilns has increased. Particularly with regard to technical ceramics such as grinding balls, substrates and hard ferrites.

Generally the highest grade of automation can be achieved by using roller hearth kilns. The transportation by rollers enables a fully automatic on-line production by including loading and unloading and connectable buffer systems for unloaded or loaded transport devices.

At present, GKT roller hearth kilns can withstand use for continuous firing up to a temperature of 1650°C.



GKT BURNERS

GKT BURNERS

OPTIMAL FIRINGS FOR EACH FUEL

GKT burner experts have more than 20 years experience in designing all type of industry burners.

As a result of our many years of experience, we are able to design our burners to minimize energy consumption and pollution. GKT experts can provide complete exchange of fuel- and / or firing-systems on currently running tunnel kilns.

As per your requirements we plan, project and calculate the redevelopment or updating of your combustion system, considering optional fuel conversions as well as probably necessary modification of components.

We are able to change complete fuel - and firing systems on running tunnel kilns.

TYPE OF BURNERS

▲ GKT RECIRCULATION BURNERS

are high velocity burners which can achieve an excellent heat transfer. All GKT recirculation burners can be provided with secondary air boxes to attain a better flue gas homogenisation as well as a faster cooling down process. As a result of secondary air supply an overheating of the fired product at low temperature is avoided as well as more control over exhaust gas. Further on GKT recirculation burners can be supplied with connections for electrical ignition, ignition burners, UV and ionization flame detection.



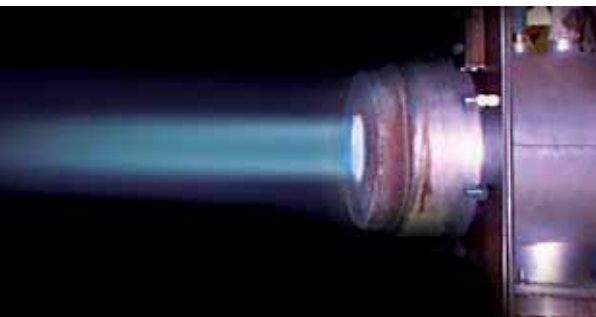
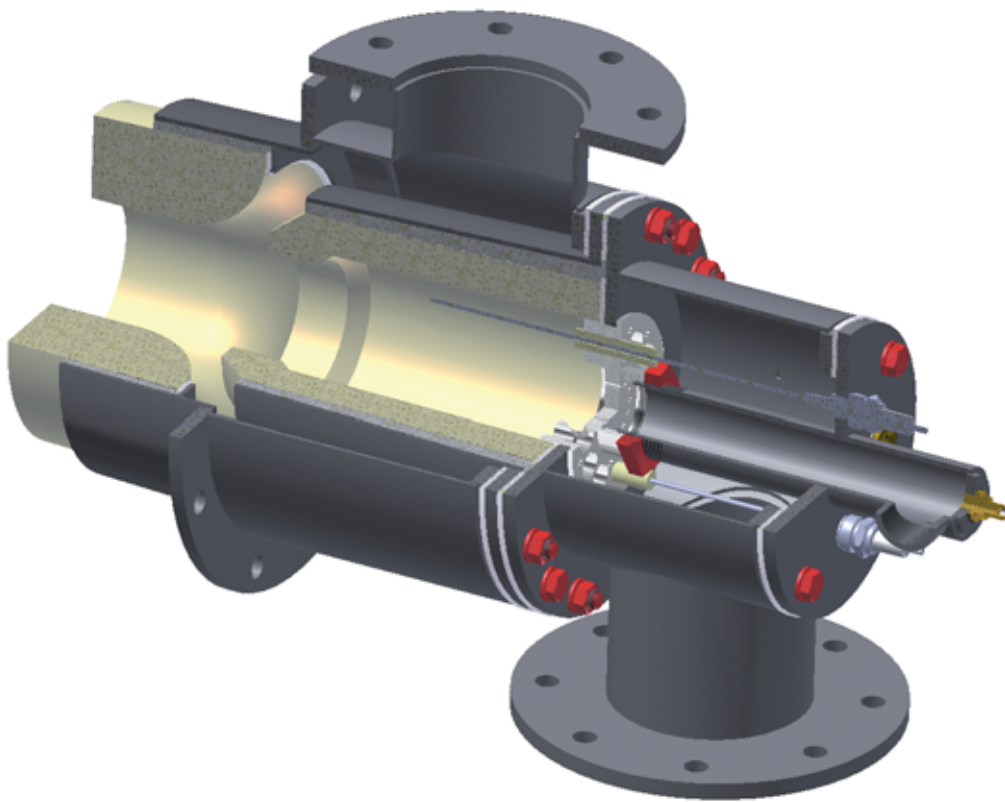
▲ GKT WLT BURNERS

are special designed burners for industrial kiln with liberation of 10-55 KW per burner. The burner has an attached burning chamber, part of the brick lining, in which nearly complete combustion is achieved. High temperature flue gas leaves the burning chamber with high velocity. Because of this high velocity an excellent heat transfer as well as an optimal temperature distribution is achieved.

▲ GKT SPECIAL BURNERS

in addition to the standard GKT burners. GKT is also able to supply burners for many special applications. The burners are used in the chemical industry, e.g. torches with discontinuously appearing flammable gases etc.

▲ Nearly all burners can be provided as **MULTI FUEL BURNERS**.

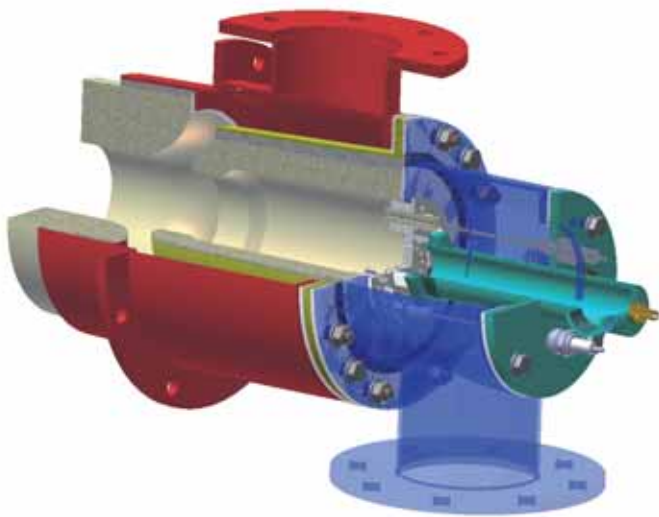


GKT Computerized Control System

GKT COMPUTERIZED CONTROL SYSTEM

PMC

The measurement and control system is the most important component of the firing process beside the burner technology and high temperature brick lining. Advancements in our technology are virtually limitless with the help of today's software. There are challenges and obstacles but none that are unsolvable. We program our procedure software according to your requirements for the firing process and control.



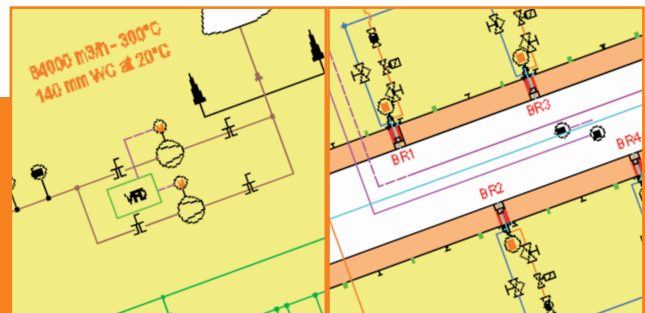
VISUALISATION

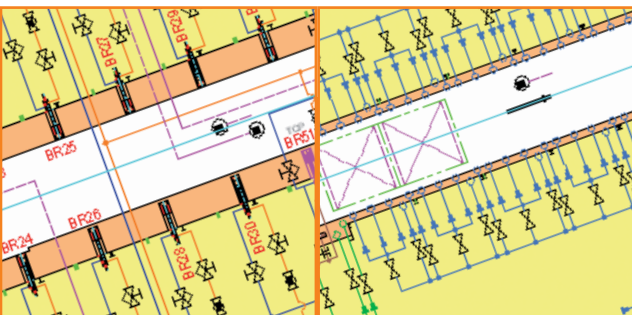
Operators are not confined to the production area monitoring and controlling can be conducted from remote locations within the plant.

The kiln is controlled by means of the specific PC software package, a control system developed by GKT with ISO standards to allow comprehensive control and monitoring of all the kiln's functions, and creates daily reports on production and the consumption of gas and electricity.

In addition a clear access level structure can be programmed to correspond to the management philosophy of the firm.

In order to run the plant safely and efficiently, a GKT specialist technician will provide a training course which includes the necessary knowledge to access the various levels of the system, with specific security standards so that adjustments to production parameters can be made as appropriate.





In addition to kiln design and manufacturing GKT offers services ranging from the consultation to complete technical support.

▲ CONSULTATION & OPTIMISATION

- Technical development
- Firing procedure technology
- PMC advice & optimization
- Energy use and recovery
- Optimizing kiln & plant operations

▲ INSPECTION

- Certified compliance inspections
- Individually tailored

▲ RENOVATION & REPAIR

- Realistic consumption reduction
- Modification & modernization of kilns
- Renewal of different components
- PMC & visualization upgrade

▲ EDUCATION & TRAINING

- Education and advice based on your needs
- Operator safety and security training
- Programming & visualization training on site

▲ MAINTENANCE & SPARE PARTS

- Monitoring of availability of spare parts
- One time & annual maintenance service plans



ENERGY SAVING & ENVIRONMENTAL PROTECTION

GKT has set up standards for energy efficiency and savings. Less consumption means lower energy costs as well as less CO₂ emissions.

By using of innovative software and the constant advancement of our plants we can offer the following system solutions that have been designed specifically for the ceramic industry:

- ▲ Energy efficiency increase by recovering waste air and waste gas flow
- ▲ Increase of energy efficiency and modernization older kiln plants
- ▲ Reduction of pollutant emissions by state-of-the-art firing technology
- ▲ Optimised measuring control technology
- ▲ GKT special burner system to achieve the best customized firing solution.

We would be pleased to offer consultation.



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