Brick and Tile Research Institute Essen regd.

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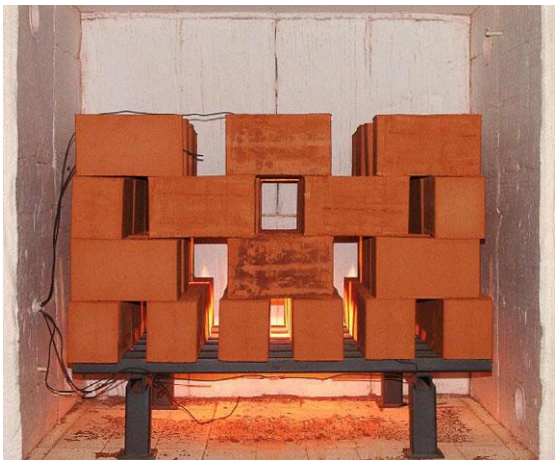
Department for Ceramic Materials



Optimization of burning curves in defined kiln atmospheres

- investigation and assessment of clay pits
- raw material testing and optimization of raw material mixture including additives
- examining of shaping behavior
- researching drying behavior and determining of parameters for the dryer design
- thermal analysis and determining of calorific values of raw materials
- researching firing behavior and optimization of product firing curve
- determination of thermal conductivity of brick bodies, single bricks and masonry parts
- brick testing according to standards and guidelines (e.g. moisture dilatation, frost resistance, chemical resistance, etc.)
- identifying of production faults
- expert reports

Process Engineering

laboratory dryer for optimization of drying curves of original sized bricks

- balance studies for dryers and kilns
- investigation of optimal drying curves for original sized bricks and hollow blocks
- consulting for energy consumption reduction and quality improvement for the drying and firing process
- planning, constructing, modifying and optimizing of drying and firing plants
- measurement of drying and firing processes
- computer simulations of drying processes with respect to the material properties

firing of original sized bricks under industrial conditions

- analysis of the entire production process
- production of small series of original sized bricks on a pilot facility
- optimizing of brick cross-sections with respect to thermal insulation
- computer-assisted dimensioning of burners at tunnel kilns
- computer-assisted calculation of thermal conductivities, temperature and heat flow distributions of perforated bricks, construction components or tunnel kilns

Environmental Engineering

Bull's Trench Kiln (BTK) emissions in Pakistan

- investigation of the emission behavior of harmful chemicals from the raw material
- calculation of chimney height according to current guidelines
- assessment of flue gas cleaning systems
- emission measurements at kilns during reconstructions or optimizations
- raw material- and material testing with respect to environmental protection
- investigation of the elution behavior of solids
- determination of damaging and soluble salts
- investigation of efflorescence and affinity of efflorescence

Available dryer equipment

adjustable variables: temperature, air velocity and humidity measurable variables: weight, shrinkage, sample temperature, air temperature, air velocity and humidity		
Dryer types	**T_{max} in °C**	**Dryer room D/W/H in cm**
dryer for single bricks	120	63/75/45
circulation dryer for round rods and small samples	120	16/16/25
dryer for setting pattern (horizontal or vertical reversing air flow)	120	75/180/64
chamber dryer (horizontal or vertical reversing air flow, ceiling height variable adjustable)	120	500/400/120
Adjustable and measureable variable: temperature		
chamber dryers	120	80/63/100
	120	100/80/200
	300	40/50/50
	650	83/62/70

Available kiln equipment

Kiln type	**T_{max} in °C**	**Fire room D/W/H in cm**
electrical heated chamber kilns	1100	78/58/67
	1200	60/37/55
	1250	30/21/14
gas heated chamber kiln	1200	90/68/78
gas heated fast firing kiln	1350	90/129/120
gas heated shuttle kiln	1200	400/270/105