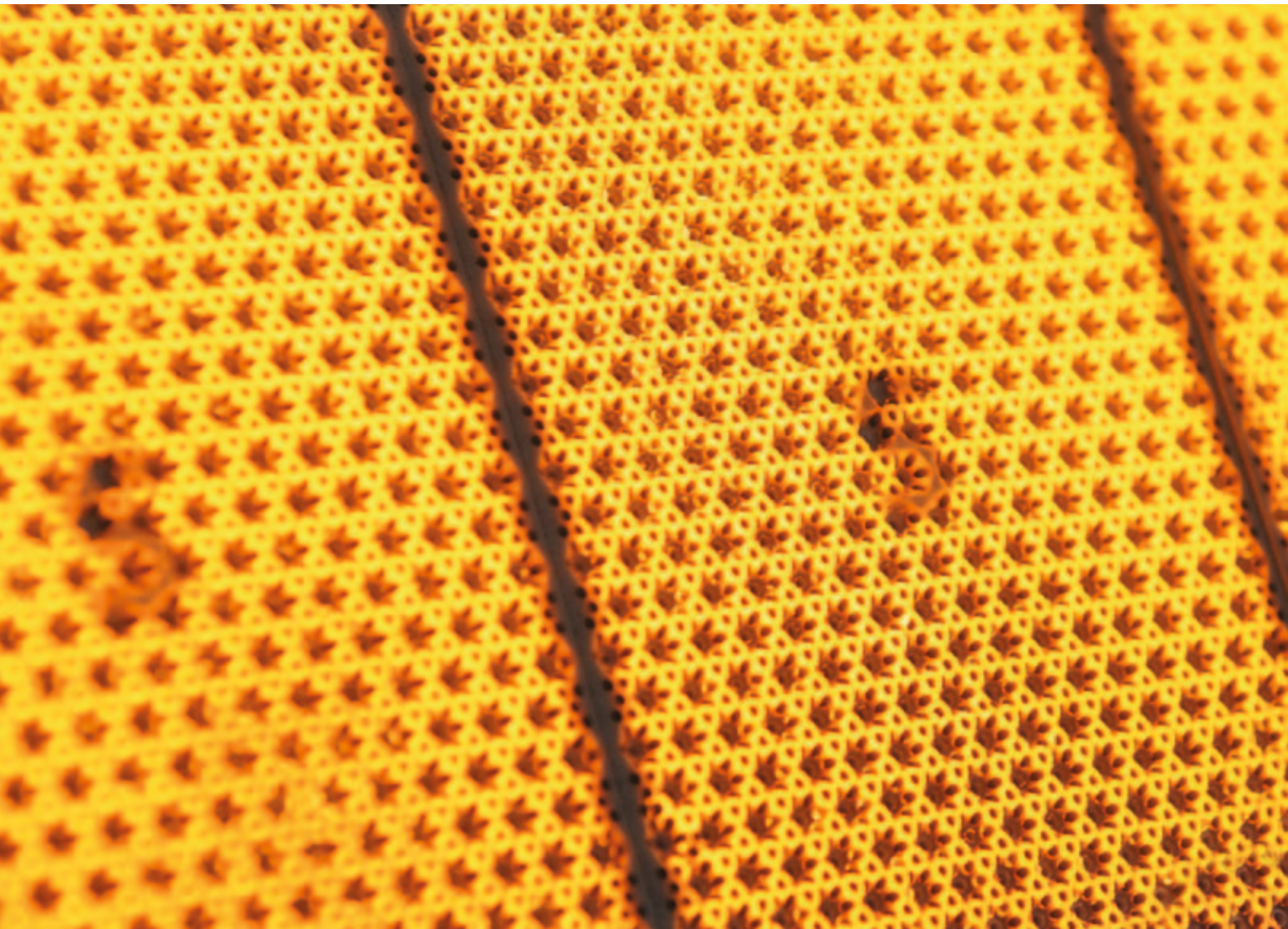


**Schwank Burners and
Ceramic Burner Tiles**
Innovative Technologies and
Efficient Heat Generation



Schwank
INNOVATIVE HEATING SOLUTIONS



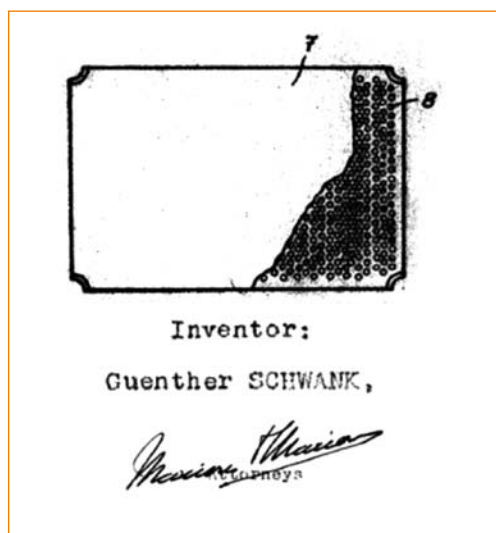
Schwank - Innovator for Clean Combustion Characteristics and Maximum Efficiency

■ Leading Manufacturer since 1938

The world's first gas-fired ceramic burner tile was developed and patented by Günther Schwank, founder of the Schwank Group, in 1938. Since that time, Schwank has developed into one of the leading manufacturers of ceramic tiles and burners. The goal: achieving maximum performance and efficiency coupled with clean combustion.

■ Quality "Made in Germany"

Throughout the world, the name Schwank enjoys an excellent reputation in the field of gas-fired infrared heaters. Extraordinarily high quality, long life-cycles as well as economical and clean combustion behaviour speak for themselves. Thanks to the "Made in Germany" in-house production of the burners and ceramic burner tiles, as well as the dedicated R&D operations, Schwank has been able to reliably guarantee these properties and improve them further over the years.



First gas-fired ceramic burner tile; approx. 1938.

Schwank Burner Technology - Derived from the Sun

Heat Output on Demand

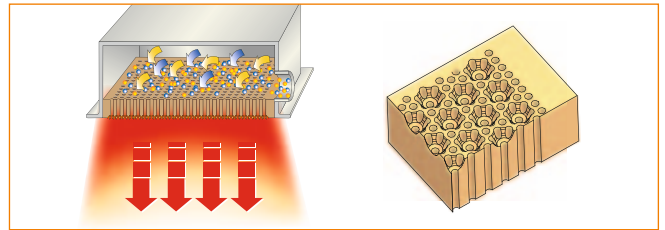
The core of all Schwank burners is the ceramic burner tile: ceraSchwank. Within its approximate 3,600 convex passages, the gas-air mixture combusts homogeneously and cleanly. Due to this heating reaction, the ceramic surface reaches temperatures of up to 1,150°C, emitting infrared radiation - like the sun. Depending on the tile structure and burner design, 150 W/cm² or more will be set free. On a surface of a 120 cm² ceramic tile, a heat output of 0.6 - 1.8 kW is generated in an infrared burner – for condensing boilers the output is 10 - 15 kW.

Infrared Radiation

Alongside the extremely wide performance spectrum, the radiation efficiency – or radiant factor – is the determining factor for most thermal engineering applications. In order to positively influence the radiation efficiency, high-quality materials are of great importance as are special characteristics of the surface and perforation. ceraSchwank features a patented formulated recipe and a special surface with a honeycomb structure providing a higher radiant efficiency than common surfaces.

Clean Combustion

Gas-fired burners with ceramic tiles by Schwank are operating in a very ecological way with low emissions. This is due to the fact that thermal NO_x and CO are reduced to an absolute minimum thanks to the homogeneous combustion. In the course of a European research project, experts concluded that ceraSchwank achieves emission values which may otherwise only be obtained by catalytically coated burner tiles. Due to these properties, ceraSchwank ranks among the most efficient and environmentally friendly ceramic burner tiles worldwide.



Functioning of the Schwank Ceramic Burner Tile

Life-Cycle

Another core feature of Schwank ceramic tiles and ceramic burners is their practically unlimited durability. The high-quality ceramics do not reveal noticeable wear or corrosion effects even when subject to an arbitrary number of hot/cold cycles over the burner's life – an essential difference to all metallic burner surfaces or conventional burner tiles.



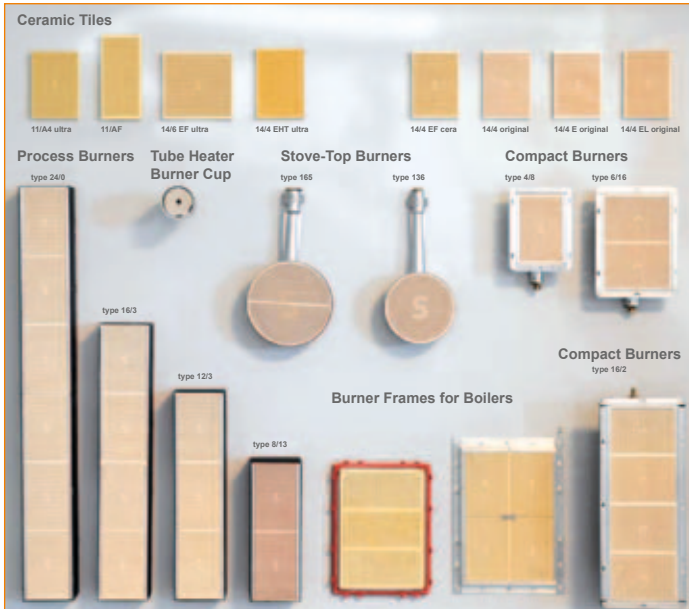
Schwank ceramic burner tiles subject to life-cycle tests.



Dimensional accuracy of up to +/- 0.1 mm.

Large Variety of Products & Applications

■ Schwank Burners and Burner Tiles are Used in the Most Versatile Applications.



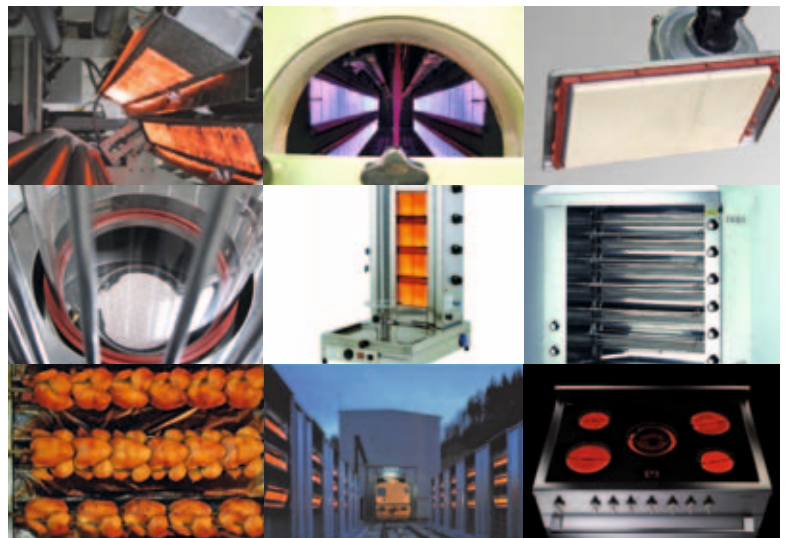
Products at a Glance Burners and Burner tiles:

- Ceramic burner tiles with and without honeycomb surface structure
- Atmospheric burners
- Cooking place burners
- Burner frames for condensing boilers
- Process burners

Product examples
for burners and tiles

Applications of Ceramic Burners and Burner Tiles:

- Decentralised infrared heating systems [luminous/high-intensity and tube heaters/ low intensity] for industrial and commercial facilities, sports facilities, stadiums or outdoor hospitality applications.
- High-efficiency condensing boilers and conventional boilers
- Space heating appliances
- Process heat e.g. for drying paper, textiles, paint and defrosting facilities
- Hospitality applications e.g. for the preparation of gyros and chicken roasters
- Hotplates, ceramic hobs and gas stovetops
- Barbecue grills
- Construction site drying systems



Typical applications for Schwank burners and tiles.

Quality and Efficiency - Properties in which we Trust

■ Maximum Radiant Performance and Life-Cycle

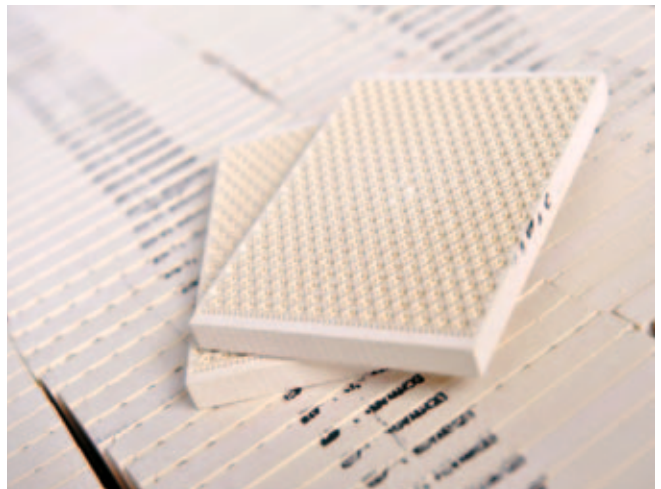
Burners and ceramic burner tiles are also being used in the products of Schwank infrared heating systems. For these heating systems, a maximum radiant performance [radiant factor] and life-cycle are essential even under the harshest conditions. For decades, Schwank has used ceramic burner tiles in a wide range of applications – and thus knows what counts. By way of in-house research & development and production, Schwank is continuously improving the product properties.

■ Properties of Schwank Products Burners and Tiles

- High mechanical strength [defined by breaking load]
- Extreme temperature stability and resistance to temperature shocks
- Extremely low thermal linear expansion
- High insulation effect through high internal porosity
- No mechanical wear, optimised ceramic structural stability due to carefully selected materials, quality tests and controlled manufacturing processes
- Special honeycomb surface structures and perforations
- Ultimate mechanical precision with tolerances of just +/- 0.1 mm



Lining of burners with ceramic tiles.

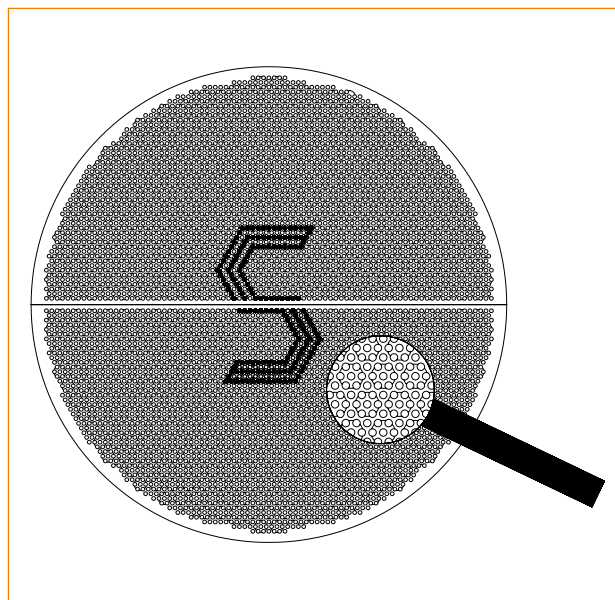
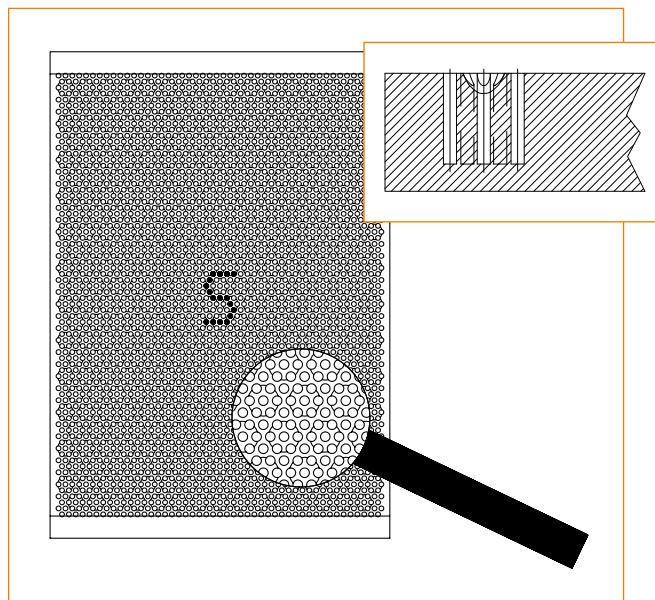


Top: ceraSchwank – one of the most efficient ceramic tiles in the world. Bottom: From development right through to production – Made in Germany.

Ceramic Burner Tiles - [Standard Tiles]

■ Technical Data

Ceramic Burner Tiles



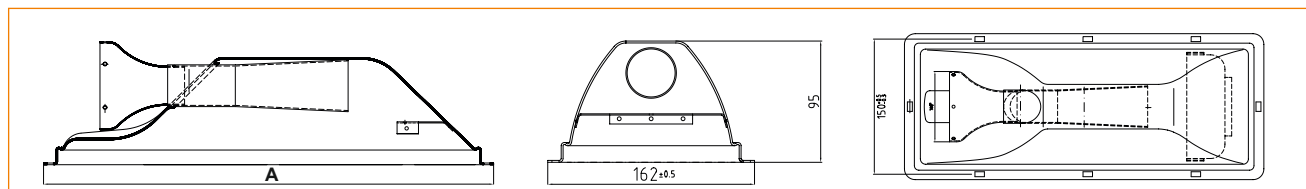
Technical Data	
Max. Size	182 x 80, 140 x 140 oder Ø 165 mm
Min. Size	68 x 48 mm
Thickness	6 - 15 mm
Shape	round or rectangular
Hole Diameter	1.0 - 1.4 mm
Surface	flat or honeycomb
Max. structural depth	< 2.8 mm
Internal Porosity	40 - 64%
Mechanical Strength [breaking load]	19 - 24kg
Max. Operational Temperature	< 1,150°C
Thermal Expansion	-1.8E ⁻⁶ - 2.5E ⁻⁶ [K ⁻¹]
Hole pattern	entire tile or partial
Holes / cm ²	< 30
Finishing [optional]	leveled, ground, cut, grooved

Atmospheric Burners

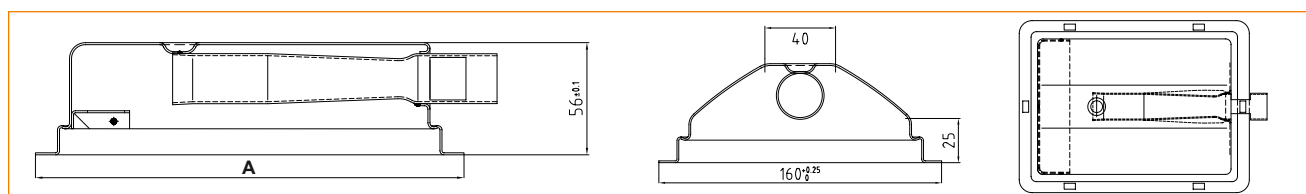
[Standard Burners]

Technical Data

Atmospheric Burners



Type	Performance [kW]	Length A [mm]	Number of Ceramic Tiles
16/2	6.5	398	4
24/2	9.8	582	6
32/1	13.0	76	8



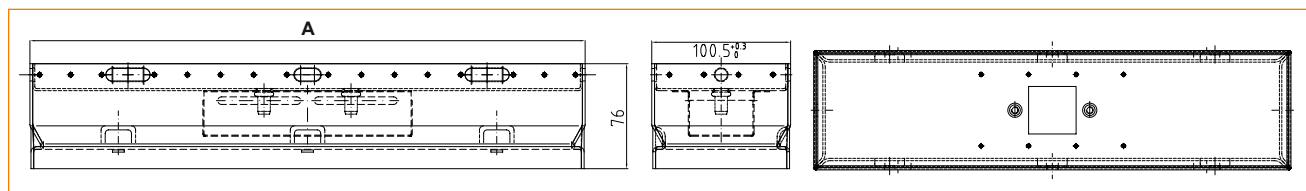
Type	Performance [kW]		Length A [mm]	Number of Ceramic Tiles
	from	to		
8/16	3	3.5	230.5	2
Gas	Natural gas	LPG	City gas	Nonstandard gas
operating pressure	17 mbar	50 mbar	6 mbar	On request

Applications:

- Infrared heaters / patio heaters
- Drying systems
- Process heat
- Road construction
- Weed killing
- Barbecues / rotisserie appliances

Technical Data

Modular burners for industrial applications [forced air]



Type	Performance [kW]		Length A [mm]	Number of Ceramic Tiles
	from	to		
8/13	1.9	3.2	270.5	2
12/3	2.9	4.9	402	3
16/3	3.9	6.5	534	4
24/3	5.9	9.8	800	6

Applications:

- Industrial process heat, modular burners may be arranged to form surface areas of arbitrary geometry

Innovative. Experienced. Competent.

Advantages at a Glance:

- High mechanical strength
- Extreme temperature stability and resistance to temperature
- Extremely low thermal linear expansion
- Long life-cycle, no mechanical wear
- Special honeycomb surface structure providing more output at the same size
- Clean combustion and an excellent flame stability
- Production accuracy with tolerances of just +/- 0.1 mm
- Quality "Made in Germany"

Experience for more safety

For more than 70 years, the name Schwank has stood for high-quality and cost-efficient heating systems. As the market leader for gas fired infrared heaters, Schwank has comprehensive experience in manufacturing cost-efficient heating systems using advanced ceramic tiles. More than 150,000 satisfied customers and over 2 million appliances produced speak for themselves [for references, see www.schwank.co.uk].

As a German manufacturer, we aspire to a high standard of excellence in delivering products and a service of the highest quality. Every single Schwank product guarantees to be highly efficient while minimising the carbon footprint.



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