

**Convincing
Technology**



GoGas®

Drying Technologies
using radiation and convection

- Engineering
- Manufacturing
- Installation
- Startup
- Service

GoGas

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GoGaS: History of Continuous Improvements and Innovations

○○○ Mr. Heinz Goch founded GoGaS Goch GmbH in 1946 as a company dedicated to the development of gas burning technologies for commercial and industrial applications.

GoGaS started a drying technology department in 1958 which included engineering, design, and manufacturing groups. All three groups were focused on drying technologies for the paper, textile, steel, aluminum, plastics, ceramics, fiber cement, food, and other industrial applications.

After the founder's death in 1972, three family members took over the company's capital stock. In 1983, Ruhrgas became a minority partner.

GoGaS opened a new Research and Development Center in 1986 which focused on development of convection dryers, combined radiation and convection dryers, and infra-red dryers.

After many years of research and development, GoGaS launched the first short wave infra-red porous burner in 2005. This new innovative technology of burner combustion called the RADIMAX, opened new fields of application in industrial drying and heating. ●●●



2005	Launched the RADIMAX which utilizes porous volume combustion
1986	Opened a new Research and Development Center
1983	Ruhrgas joined GoGaS as a minority partner
1974	Designed the first floatation dryer for steel strip processing
1958	Started the drying technology department
1952	Manufactured the catalytic burner for industrial use
1946	Mr. Heinz Goch founded the Company

**It is not enough to know,
you have to apply;
It is not enough to want,
you have to do**

(Maxims and reflections, Johann Wolfgang von Goethe)

Unparalleled Experience in Infra-Red (IR) Technology

GoGaS offers unparalleled experience with the various types of infra-red burners including the RADIMAX porous burner, the metal fiber burner, the ceramic burner, and the catalytic burner. GoGaS' experience and products cover the complete range of the various wave lengths of infra-red gas technology. Gas was selected as the energy offering minimum costs to the customer and permits GoGaS the flexibility of presenting individual tailored solutions to each specific customer requirement. Each project benefits from the many years of GoGaS experience in infra-red technology.

Long Wave Burner

Gas fired, catalytic infra-red burners are a safe and flameless heating technology that produces a uniform low intensity heat. A wide range of material can evenly absorb long wave energy. This allows the product to be heated in small increments.

Medium Wave Burner

GoGaS supplies three different types of gas-fired medium wave infra-red burners, a ceramic burner, and a metal fiber burner with either a sintered surface or a knitted (woven) surface. These medium wave infra-red burners have proven their reliability in millions of successful operating hours. All provide a homogeneous radiation area of almost any length and width. Higher energy efficiency can be achieved by the use of a hot air cushion between the burner and the material to be dried.

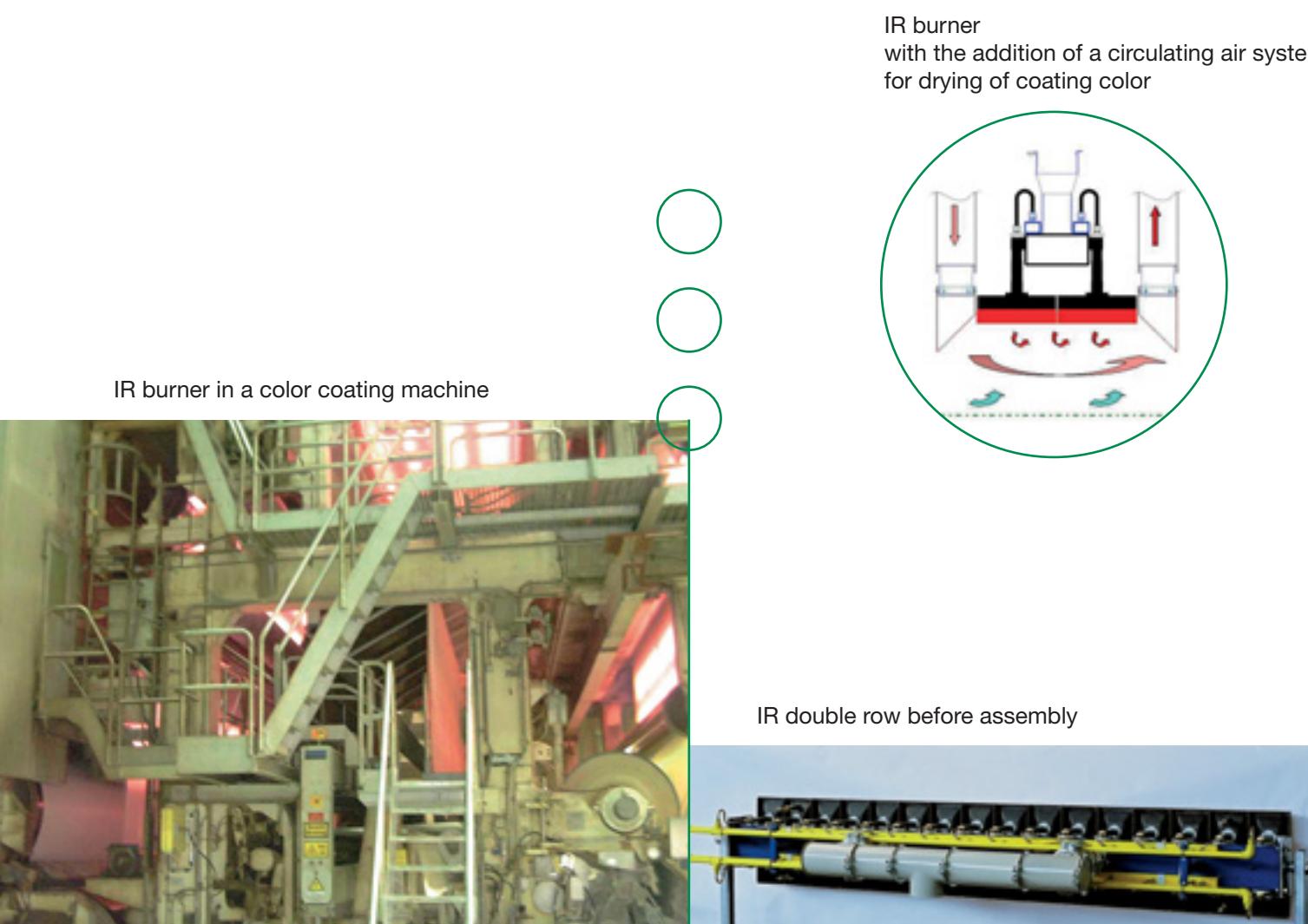
Short Wave Burner

In cooperation with the University in Erlangen, GoGaS developed a complete new concept for gas infra-red burners. Called the RADIMAX, it differs from conventional burners in that combustion does not take place at the burner surface, but rather inside an inert three dimensional porous medium. This new innovative combustion technology emits extremely high infra-red radiation which opens new fields of application in industrial drying and heating.

Type	Catalytic Burner	Ceramic Burner	Metal Fiber Burner knitted (woven) surface	Metal Fiber Burner sintered surface	Porous Burner RADIMAX
Kind	long wave burner	medium wave burner	medium wave burner	medium wave burner	short wave burner
Wave length	3.3 - 5 µm	2.4 µm	2.2 µm	2.2 µm	1.7 µm
Max. burner temperature	600 °C / 1112 °F	950 °C / 1742 °F	1050 °C / 1922 °F	1050 °C / 1922 °F	1450 °C / 2642 °F
Max. thermal load	30 kW/m ² 9500 BTU/ft ²	120 kW/m ² 38000 BTU/ft ²	200 kW/m ² 63400 BTU/ft ²	250 kW/m ² 79200 BTU/ft ²	1000 kW/m ² 317000 BTU/ft ²
Dimensions mm / inch	600 x 600 mm / 23.6 x 23.6" 450 x 1200 mm / 17.7 x 47.2" 450 x 1500 mm / 17.7 x 59.0" special size on request	140 x 375 mm / 5.5 x 14.75" 100 x 270 mm / 4.0 x 10.6" 100 x 400 mm / 4.0 x 15.75" 100 x 535 mm / 4.0 x 21.0" 100 x 800 mm / 4.0 x 31.5" special size on request	140 x 375 mm / 5.5 x 14.75" 100 x 270 mm / 4.0 x 10.6" 100 x 400 mm / 4.0 x 15.75" 100 x 535 mm / 4.0 x 21.0" 100 x 800 mm / 4.0 x 31.5" 300 x 400 mm / 11.8 x 15.75"	150 x 200 mm / 5.9 x 7.9"	150 x 200 mm / 5.9 x 7.9"
Paper drying			✓	✓	✓
Textile drying		✓	✓	✓	
Paint drying	✓	✓	✓	✓	✓
Curing of powder coating	✓	✓	✓	✓	✓
Coil Coating	✓		✓	✓	✓
Heating process	✓	✓	✓	✓	✓

Paper Drying

Infra-red burners are normally used for drying of the coated web in paper processing equipment. GoGaS uses the RADIMAX porous burner or the metal fiber burners (knitted or sintered) depending on the required capacity and the space availability. These burners, noted for their reliable operation, offer uniform drying of the coating color at maximum efficiency. •••



Textile Drying

GoGaS infra-red pre-dryers have a proven history of being the technology used to improve quality and efficiency during the dyeing of textiles. The radiation energy is generated by either gas or electric burners and with a quick cool-down, the GoGaS infra-red burners ensure absolute safety in all operating conditions. •••



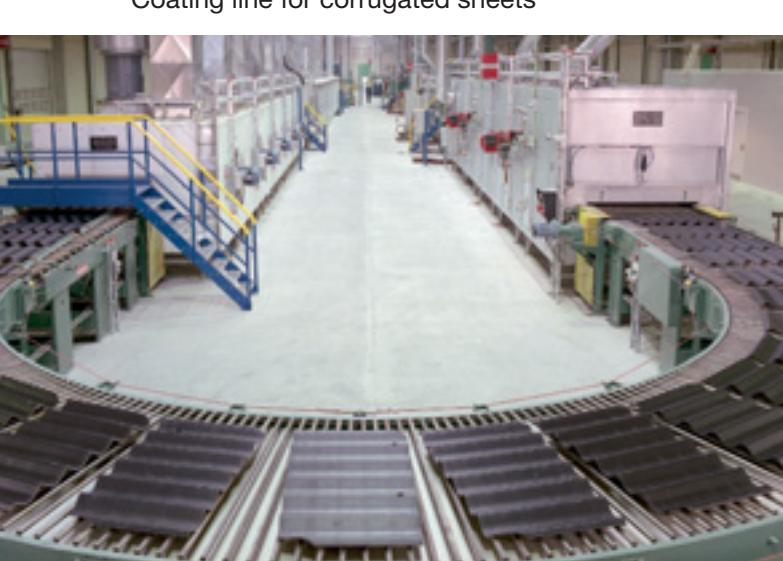
Paint Drying

○○○ The GoGaS product line for paint drying includes circulating air dryers and infra-red dryers for either wet paint or powder coating applications.

GoGaS provides many years of experience and expertise in the manufacture and supply of conventional circulating air dryers and infra-red dryers. GoGaS is the only dryer manufacturer in the world that offers long wave, medium wave, and short wave gas fired infra-red burners. That uniqueness makes GoGaS number one in providing excellent solutions for the customer's specific process. •••

Building Materials

○○○ GoGaS supplies components, as well as turnkey systems, for drying and surface coating of various materials. These materials include gypsum fiber, wood and fiber cement boards, and roof tiles in either flat or corrugated forms. The complete turnkey systems include transportation, heating, coating, drying, cooling, and stacking processes. •••



Coating line for corrugated sheets



Gas IR curing zone for powder coatings

Heating channel with GoGaS metal fiber burners



Radiating Fields

○○○ Radiating fields are suitable in cases where it is necessary to have a high heat transfer in a small space. These type systems, having to operate especially efficiently due to the high energy demand, use the fumes for additional convective heat transfer.

GoGaS has the experience, expertise, and range of products with different wave lengths to provide the optimum solution to different conditions of operation. •••

Examples of application:

- caramelize sugar icing on cookies
- testing of fireproof clothing
- warming of plastic foils before thermoforming
- dry coating



Radiating field with GoGaS ceramic burners



Railcar Defrosting Installations

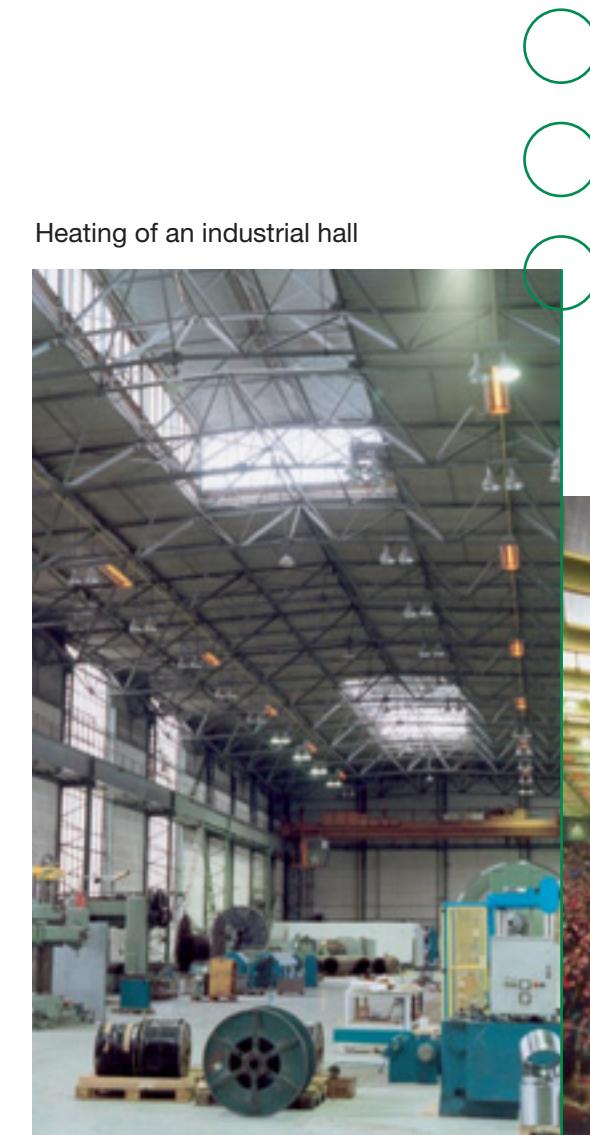
• • • Bulk solids can be discharged trouble-free during the winter months with our defrosting installation. Bulk solids include black coal, ores, gypsum (from flue gas de-sulphurization), limestone, etc. We offer four different types of defrosting installations which have proven to be technically advanced, reliable and practical in use. By preventing production stops, our defrosting installation will reduce your cost and improve your efficiency. • • •

Methods to defrost railcars:

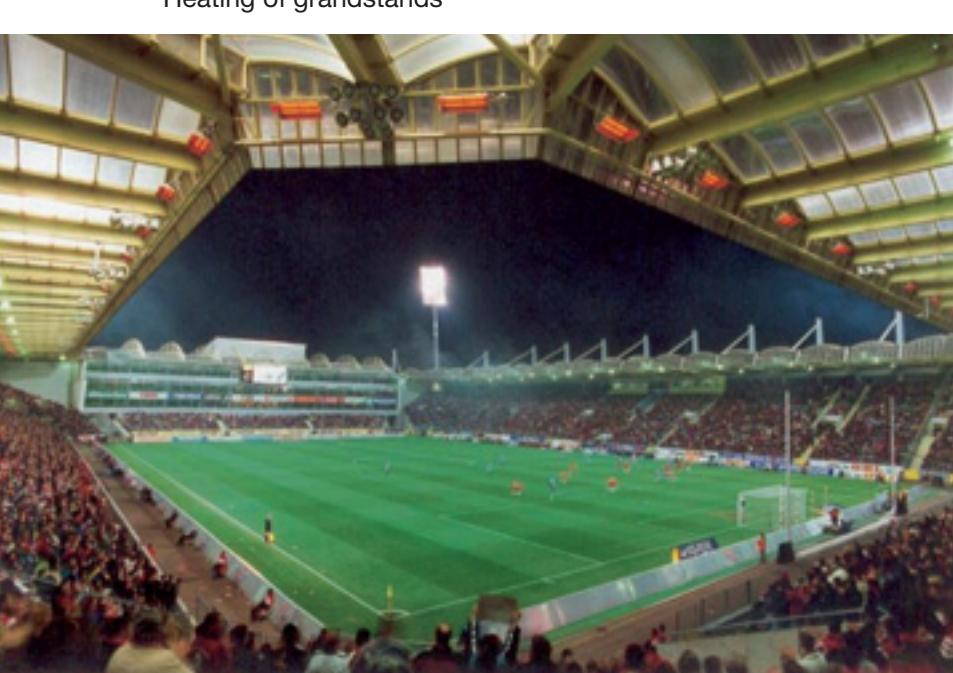
- ceramic burners for heating the side surfaces and special floor burners
- dark radiators for heating the side surfaces and special floor burners
- electrical infra-red radiators and special floor burners
- warm air defrosting



GoGaS free-standing defrosting installation for railcars



Heating of an industrial hall



Heating of grandstands

Space Heating Systems

• • • GoGaS provides efficient cost-effective solutions for space heating of commercial and industrial buildings or structures. The wide range of space heating systems include bright radiation, dark radiation, warm air heating, and air conditioning equipment, plus appropriate controls for buildings or structures such as:

- manufacturing plants
- warehouses or storage buildings
- stadiums and sports facilities
- patios and decks
- churches