

# ALL-ROUNDER FOR SPECIAL TASKS

The SSB swirl burner turns difficult-to-process by-products into valuable special fuels

Lean substances and gases, liquids or dusts with a low heating value are often created as by-products in industrial production. Their thermal use, instead of expensive disposal, or their restricted use with the increased use of expensive supporting fuels such as natural gas or fuel oil, is a sensible measure from an economic as well as ecological perspective. SAACKE developed the internally designed steam assisted pressure jet atomizer precisely for this reason, the result: the SSB series ("SAACKE Swirl Burner"). It has now been supplemented by a tangential windbox. This swirls the combustion air more forcefully into the burner and enables a particularly short, stable flame to be used as well as the low-emission utilization of special fuels.

## MODULAR CONSTRUCTION AND INCREASED FLEXIBILITY

Regardless of the fuel, all basic versions are already equipped with features required for reliable operation in process combustion. The SSB burner series is successfully used for boiler firing as well as in thermal processing and drying plants. They are ideally suited as pilot and support burners, such as in waste incineration plants. Their modular construction is specifically designed for upgrades or modernizations, while the utilization of a variety of fuels reflects their flexibility.

## INDUSTRIAL SECTORS

Energy and heat supply

Chemical industry

Refineries

Foods

Steel and metal production

Waste incineration

Building materials

Wood processing

Standard ships and offshore plants

## ALL BENEFITS AT A GLANCE

- Reliable utilization of liquids, gases and dusts with a low heat value without support firing
- Saves on expensive standard fuels such as natural gas and light fuel oil
- Particularly stable and short flame at low heat values; the flame length can be adjusted by a swirl vane
- Under- and over-stoichiometric operation with  $\lambda$  0.3 - 4
- Broad control range
- Reliability below the emission limits in operation with special fuels
- Low-maintenance, thanks to the swirl burner technology



**SSB-LCG: RELIABLE UTILIZATION OF GASES WITH LOW HEAT VALUES**

The SSB-LCG reliably converts waste gases with extremely low heat values (such as blast-furnace or converter gases), virtually inert flue gases and even explosive vent gas-air mixtures into usable energy sources. A special muffle to introduce the gases is installed behind the burner, in which the super-critically swirled flame burns stably without support fuel. A higher heating value support fuel is only needed to reach the operating temperature. The temperature profile is extremely homogeneous, thanks to the optimal mixing of combustion air and gas, and NO<sub>x</sub> emissions are often below 20 mg/m<sup>3</sup>.

As the gas only flows in behind the actual burner, the drop in gas pressure is less than 15 mbar. This removes the need for additional investment in compressors. The air could be heated to 300 °C to increase the efficiency. Special designs utilize up to four gases and one liquid fuel. The SSB-LCG is naturally also designed for use with standard fuels, if low heat value substances are not always available. Combined operation with several fuels is also possible.

**SSB-LCL: THERMAL UTILIZATION OF LIQUIDS WITH LOW HEAT VALUES**

The SSB-LCL even burns liquids with a heating value less than 10 MJ/kg with only minimal support firing. The liquid fuel is injected into the hot combustion muffle with the aid of an atomizing lance. This special design allows for the thermal utilization of previously unsuitable substances such as molasses or vinasse. High fuel-nitrogen ratios or high viscosity of up to 20 cSt, 10 percent ash or 50 percent water are absolutely no problem for the SSB-LCL. The burner can even be modified to take an additional liquid fuel or fuel gas if desired.

**SSB-D: OPTIMAL COMBUSTION OF EVEN THE MOST DIFFICULT DUST**

Dust particles smaller than 0.5 millimeters are suitable for optimizing the thermal and economic balance. Whether petroleum coke, charcoal, lignite or coal dust, biogenic dusts such as rapeseed meal, fermentation substrate or soy and coffee husks, which are almost too small for the human eye, all can be utilized by the SSB-D in steam and heat generation or even in drying processes. The dust flame stability and the reliably low soot and CO emissions, well below limits, are particularly impressive.

Combustion figures of almost 100 percent are achieved thanks to the special flue gas recirculation within the flame zone. An explosion-safe dosing system as well as highly responsive safety valves contribute to the highest possible accident prevention standard. With its modular construction, the SSB-D is also available as a combination-type burner with natural gas or fuel oil.

**CONCLUSION**

The SAACKE SSB series has proven its worth in areas with a diverse range of requirements for over 20 years. Its wide range of application options allows the swirl burner to utilize substances with a particularly low heat value, which increases the range of fuels used, as well as reducing its own return of investment period with more efficient and economic operation.

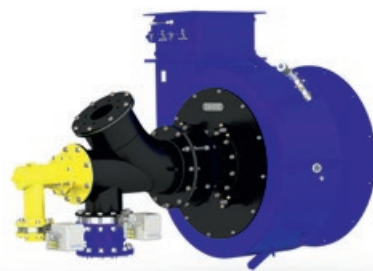
SSB – LCG



SSB – LCL



SSB – D



**Technical data:**

	Applications	Burner capacity	Fuels
<b>SSB-LCG</b>	All heat generators	1-100 MW	Gases with extremely low heat values over 2.0 MJ/m <sup>3</sup> without supporting fuel
<b>SSB-LCL</b>	Water-tube boilers, thermal fluid heaters and hot gas generators	2-50 MW	Liquids with extremely low heat values (5-15 MJ/kg)
<b>SSB-D</b>	Water-tube boilers and hot gas generators	2-60 MW	All fuels present as dusts with a particle size <0.5 mm and a heat value of 10-30 MJ/kg

