PILLER BLOWERS & COMPRESSORS
IN THE NITROGEN & SYNGAS INDUSTRY

UREA AND NITROGEN FERTILIZER
PRODUCTION
– Gas Blowers for complex fertilizers (NPK)

HYDROGEN GENERATION H₂, HTCR™ PROCESS
BY HALDOR TOPSOE
– Combustion Air Blowers > 70 kPa

SULPHURIC ACID PRODUCTION
– Air, SO₂ Gas Blowers

AMMONIA AND METHANOL PRODUCTION /
PROCESSING
– N₂ Blowers for start up circuit
– Recirculation Blower for Formaldehyde/UFC
  production (FORMOX™ process)

STEAM COMPRESSION
Blowers for Mechanical Vapor Recompresssion
– Wastewater Treatment
– PILLER Industrial Heat Pump
PILLER BLOWERS IN HYDROGEN TECHNOLOGY

The Haldor Topsoe Convection Reformer (HTCR™) is a well known steam reforming technology for hydrogen production. PILLER Blowers are used in this process to supply the burner for the combustion chamber with air. For the required high differential pressure (approx. 80 kPa), an installation of two blowers in series is used as a reliable and economical solution.

### PILLER in Hydrogen Technology

**Radial blower** 45773 KX 80560 – Two blowers in series with connecting ductwork
**Location** Russia
**Gas composition** Air

**Technical Data**
- Suction volume flow: 49,937.4 m³/h
- Inlet temperature: –50 °C to +38 °C
- Differential pressure: 78.03 kPa
- Efficiency, blower 1: 82.7 %
- Efficiency, blower 2: 81.6 %
- Shaft speed: 3,360 rpm
- Shaft power, blower 1: 563.6 kW
- Shaft power, blower 2: 577.7 kW
- Material
  - Impeller / Casing: N-A-XTRA® 700 (1.8988)
  - Shaft: 1.4571 (AISI 316Ti)

PILLER BLOWERS IN THE SULPHURIC ACID PROCESS

Sulphuric acid is produced almost exclusively by the so-called contact process or double contact process. The task of the blower is to convey the usually dry SO₂ or the required air through the entire plant and to overcome the system resistance in equipment and pipelines.

**Air Blower**
A blower conveys dry air for the sulphur combustion to the furnace. The blower is located downstream of the drying tower where the air is sprinkled with e.g. 93 – 98 % sulphuric acid. The blower can also be installed upstream of the drying tower, then it transports humid atmospheric air.

**PILLER in Sulphuric Acid Process**

**Radial blower** 50770 KX 81120
**Location** Kazakhstan
**Gas composition** Air

**Technical Data**
- Suction volume flow: 222,249 m³/h
- Inlet temperature: –30 °C to +30 °C
- Differential pressure: 49 kPa
- Efficiency: 77 %
- Shaft speed: 2,059 rpm
- Shaft power: 453.6 kW
- Material
  - Impeller / Casing: N-A-XTRA® M700 (1.8928) / N-A-XTRA® 700 (1.8988)
  - Shaft: ST 52-3

**SO₂ Gas Blower**
The dedusted, washed and cooled SO₂ gas is moved by an SO₂ gas blower through a drying tower sprinkled with approx. 96 % sulphuric acid to the contact plant.

**PILLER in Sulphuric Acid Process**

**Radial blower** 28790 KXGAE 90250
**Location** Germany
**Gas composition** Air and SO₂, H₂O < 30 mg/Nm³

**Technical Data**
- Suction volume flow: 10,241.937 m³/h
- Inlet temperature: 55 °C
- Differential pressure: 49.41 kPa
- Efficiency: 77.2 %
- Shaft speed: 5,498 rpm
- Shaft power: 166.2 kW
- Material
  - Impeller / Casing: 1.4501 (Super-Duplex)/1.4462 (Duplex)
  - Drive: Single stage steam turbine

PILLER BLOWERS IN THE METHANOL PRODUCTION

N₂-Blowers are used for the preparation of Reforming and Syngas plants and the pre-heating of the Synthesis-Catalyst.

**PILLER in Methanol Production**

**Radial blower** 28730 GKXGAEQP 90160
**Location** Russia
**Gas composition** N₂ Nitrogen

**Technical Data**
- Suction volume flow: 10,241.937 m³/h
- Inlet temperature: 55 °C
- Differential pressure: 265.13 kPa
- Efficiency: 73.9 %
- Shaft speed: 8,649 rpm
- Shaft power: 453.6 kW
- Material
  - Impeller / Casing: N-A-XTRA® M700 (1.8928) / N-A-XTRA® 700 (1.8988)
  - Casing: ST 52-3
  - Shaft: 1.6582

BLOWER DESIGN – MADE BY PILLER

It is worth taking a look at the engineering features of PILLER Blowers to get a brief overview in comparison with other solutions:

- **Special Materials and Surface Treatment:**
  PILLER has a wide variety of materials available to meet special application needs, e.g. impellers made out of Duplex or Titanium.

- **Impeller Design:**
  The closed radial bladed impellers – MADE BY PILLER – are extremely useful in applications that require the highest attainable efficiency.

- **Shaft Seal:**
  The blower shaft must be sealed at the shaft passage to prevent process gas leakage. The floating ring type shaft sealing ensures the tightness of the blower. The seal has a horizontal split which allows easy assembly and maintenance without dismantling the impeller.

- **Bearing:**
  A Squeeze Oil Damper Bearing system was developed and patented by PILLER. It combines the simplicity and low cost of anti-friction bearings with the performance of hydrodynamic supercritical speed fluid film bearings. In many applications PILLER Blowers replace Turbocompressors. Advantages are: smaller investment, better efficiency, wider range of operation, lower maintenance costs and less sensitivity to process gas contamination. This leads to higher reliability and easier operation.