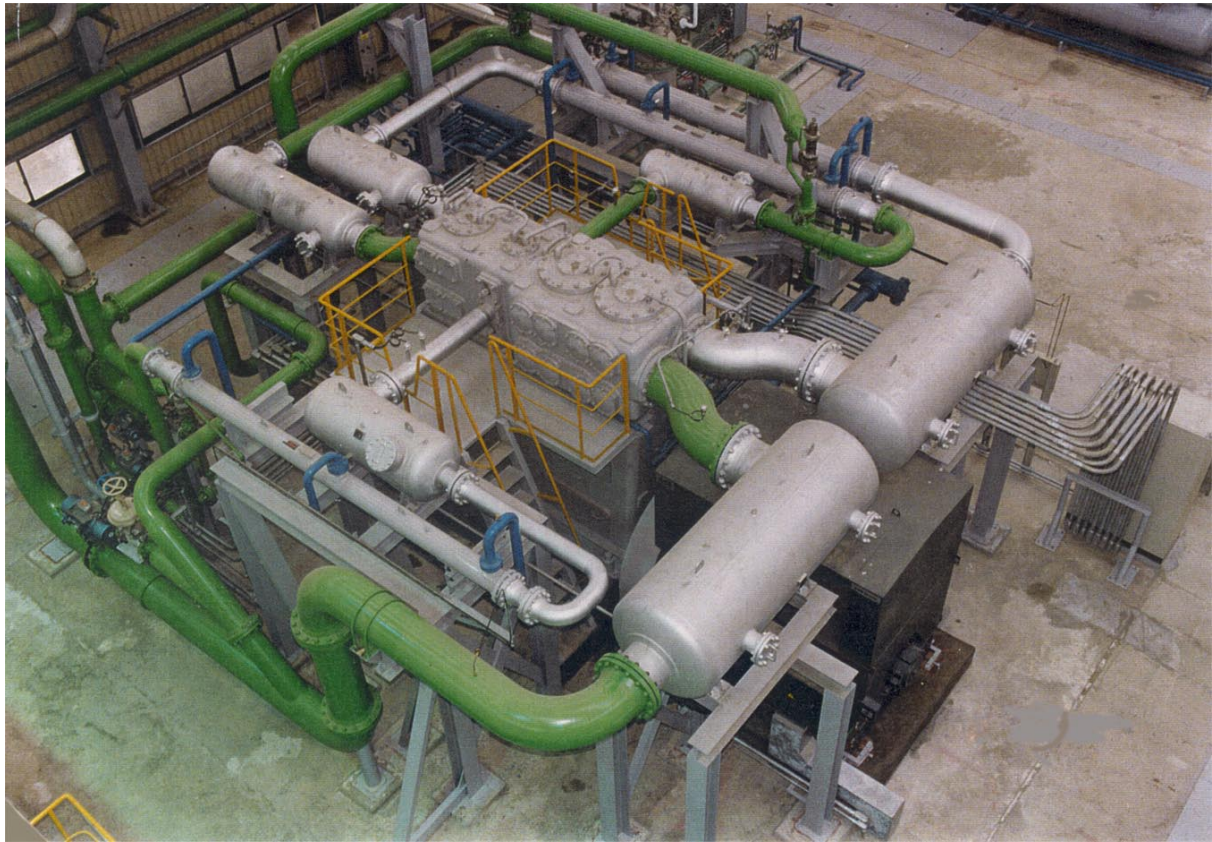




## Labyrinth Piston Compressor



### Design Features

- Oil-free compression
- Contact-free sealing of piston and piston rod
- Piston guidance by crosshead and guide bearing in the crankcase
- Simple and robust compressor design
- Suitable for long and uninterrupted service
- Large variety of standard units
- Discharge pressure up to 300 bar (4350 psi)
- Flow up to 11'000 Nm<sup>3</sup>/h (6500 scfm)
- Shaft power up to 2100 kW (2800 HP)

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# Burckhardt Compression

## Markets and Applications for Labyrinth Piston Compressors (Laby®)

### Industrial Gas Applications

- Oxygen
  - PSA/VSA air separation plants separate air into its components by adsorption. Oxygen is supplied with a purity of 93 to 97 % at moderate pressure levels.
  - Cryogenic air separation plants produce high purity oxygen, nitrogen, etc. and, depending on the process, deliver the product in gaseous or liquid state at a wide pressure range.
  - Oxygen consumers such as the steel industry, chemical industry, petrochemical industry, etc. often require gas pressures higher than those delivered by air separation plants. Therefore, compressors are needed. Oxygen promotes oxidation of a large variety of materials, including metals. Therefore, compression of oxygen can be dangerous, particularly at high pressures. The contact-less sealing technique of the Laby® design guarantees highest possible safety when compressing oxygen.
- Nitrogen
  - Air separation plants supply nitrogen at a very low dew point. Compressing this dry gas is a highly demanding task for dynamic sealing elements installed in ring sealed reciprocating compressors. The Laby® with its labyrinth sealing elements easily masters this task.
- Carbon Dioxide
  - Applications such as production of ethylene oxide and ethylene glycol require compression of gas mixtures with a high carbon dioxide content. This task is also easily handled by the Laby®.
- Carbon Monoxide
  - Carbon monoxide is used to manufacture acetic acid, polyurethane, polycarbonate, etc. It decomposes at elevated temperatures and, therefore, local high temperature spots have to be avoided during compression. Ring sealing elements create hot spots, whereas labyrinth sealing elements as installed in the Laby® avoid them.
  - The completely closed and, therefore, gas-tight crankcase of the Laby® keeps the toxic gas inside the compressor.

### HPI Applications

- Petrochemical Industry
  - In many petrochemical plants recycle gases carry dust and other particles into the compressor, which cause severe wear problems on ring sealing elements. The labyrinth seals in the Laby® are not affected by these impurities. Sulzer Burckhardt has experience with almost all processes known in the polypropylene and linear low density polyethylene market.
  - The gas-tight Laby® without gas leakage to the atmosphere is the optimal solution for oil-free ethylene feed gas applications with suction pressures up to 25 bar.
  - The Laby® is successfully used for special applications such as compression of fluorine-mixtures, VCM production, etc.

### Boil-Off Gas Applications

- The Laby® is particularly suited as a boil-off compressor for liquefied natural gas (LNG), petroleum gas (LPG), propylene, ethylene and other hydrocarbon gases for reasons such as:
  - Long time experience with this compressor design in boil-off applications
  - Gas-tight design of the compressor crankcase
  - Oil-free gas compression
  - Insensitive to sudden suction temperature changes; boil-off gas compressors for LNG receiving terminals are able to handle suction temperatures down to minus 160°C.