

Oil-Flooded Screw Compressor with 100barG Discharge Pressure

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Screw compressors have characteristics of rotary type compressors, despite being positive-displacement type compressors, and are used widely in industries because of their high efficiencies, small foot print sizes and long maintenance interval. In particular, oil-flooded screw compressors, in which oil is injected into the compressed gas, are capable of achieving high compression ratios with single steps and are expanding their applications, as the lubrication oil and oil-separation technologies have improved.

Kobe Steel developed a high discharge pressure compressor, with maximum discharge pressure of 100 barG, based on the technology for the "EH series", which covers discharge pressures up to 60barG.

One of the applications, where oil-flooded screw compressors are advantageously used, is the fuel gas compression for gas turbines. Recently, high discharge pressures are required for fuel gas compressors to improve the power generation efficiencies of gas turbines. Combined with our conventional series, the new compressor has enabled us to cover almost all the air volume and pressure requirements from gas turbine manufacturers.

On the other hand, the requirements for sulfur content reduction in automobile gasoline and diesel fuel are increasing worldwide for environmental protection, and petroleum companies are working hard to reduce sulfur contents in fuels. The main process to reduce sulfur in fuels is the desulfurization process using hydrogen and the new compressor is expected to be used, e.g., for the hydrogen compression for desulfurization and net gas boosters.

Features

- 1) High discharge pressure: The compressor covers discharge pressures up to maximum 100barG, the highest in the world for screw compressors.
- 2) High suction pressure: The new compressor can handle suction pressures up to 100barG, which may be reached during pressure variations, and can be used for the recycle compressors of desulfurization with low differential pressures.
- 3) Low energy consumption: A slide valve in the new compressor allows a linear displacement control.
- 4) Small foot print size: The high reliability of the new compressor does not require any spare machine, enabling the reduction of its installation space area compared to other types (reciprocating-type and centrifugal-type) for a given wind volume capacity.

Applications

Fuel gas compression for gas turbines; Compression of various gases used in petroleum refining and petroleum chemistry; and Oil & Gas service.

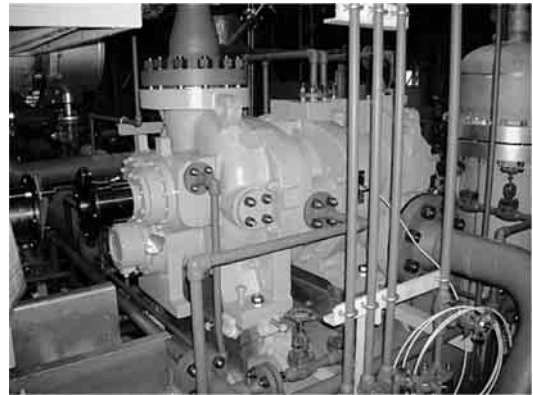


Photo 1 Outside view of Oil-flooded screw compressor

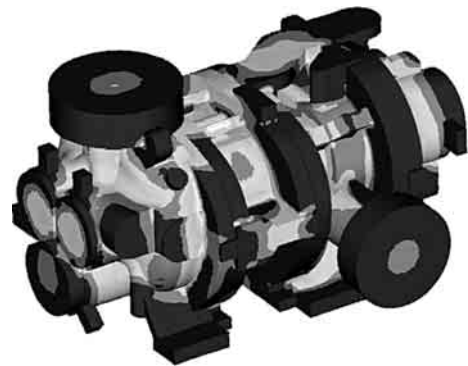


Fig. 1 Analysis of casing

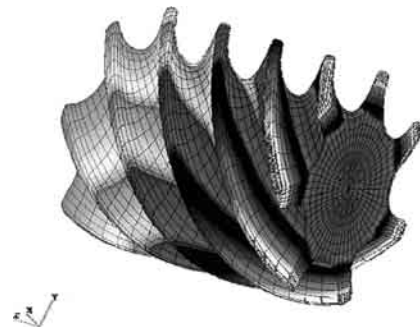


Fig. 2 Analysis example of compressor rotor temperature

Table 1 Main specifications of the high-pressure oil-flooded compressor

Displacement	200 ~ 20,000m ³ /h
Rotor profile	KOBELCO "EH" profile
Maximum discharge pressure	100barG
Maximum suction pressure	100barG
Material	Rotors: Forged carbon steel Casing: Cast steel
Shaft seal	Mechanical seal (Double arrangement available)
Capacity control	Step less 100% to 15% by slide valve Depending on rotor size