

## THE BOSS OIL WIPER PACKING

Innovation for your compressor

LOW OIL LEAKAGE DUE TO HIGH SCRAPING EFFICIENCY  
TIGHTNESS INHERENT TO THE SYSTEM AGAINST DIRECT PASSAGE OF OIL  
AND PROCESS GAS FROM THE INTERMEDIATE DISTANCE PIECE

The **B**alanced **O**il **S**ealing **S**olution (BOSS oil wiper packing) is an innovative scraper design, developed and patented by STASSKOL. The BOSS oil wiper packing is characterized by a high scraping efficiency and tightness, due to its design which reduces both oil and gas leakages to a minimum. In addition, the PEEK and PTFE materials of our own manufacture prevent the surface of the piston rod from damages.

# THE BOSS OIL WIPER PACKING

## Innovation for your compressor

### THE TASK

Adequate lubrication of all moving parts in the crankcase of a compressor is essential for the lifetime of the engine. Oil wiper packings are used to prevent engine oil from migrating through the crankcase in the direction of the cylinder (intermediate distance piece). They have the following requirements:

- » Low oil leakage due to high scraping efficiency even at high piston speeds
- » The tight position of the oil scraper rings avoids direct oil passage and overflowing process gas from the intermediate distance piece
- » Longer operation lifetime due to low wear of the scraping edges

Conventional oil wiper packings are made of metallic scraper rings, divided into segments by separating cuts. The sharp metallic scraping edges can irreversibly damage the piston rod. Furthermore, in case of strong pulsation of the crosshead, oil can enter the intermediate distance piece through the separating cuts of the scraper rings. For this reason, STASSKOL developed a non-metallic oil wiper packing with high scraping efficiency and sealed separating cuts.

### THE DEVELOPMENT

STASSKOL uses computer-aided flow simulations for the development of new products. These results facilitate the development of new designs. The realization of the design takes place on our in-house test compressor (see picture below). Here, the efficiency of the products can be tested in realistic conditions. The use of these two methods helped STASSKOL to develop the unique geometry of the BOSS scraper rings. After extensive field tests with selected customers, the "BOSS" was ready for the market.



Test compressor at STASSKOL



## THE SOLUTION

The two scraper rings of the main scrapers are made of materials produced in-house (PTFE and PEEK) and have scraping edges with a special geometry (see picture below).

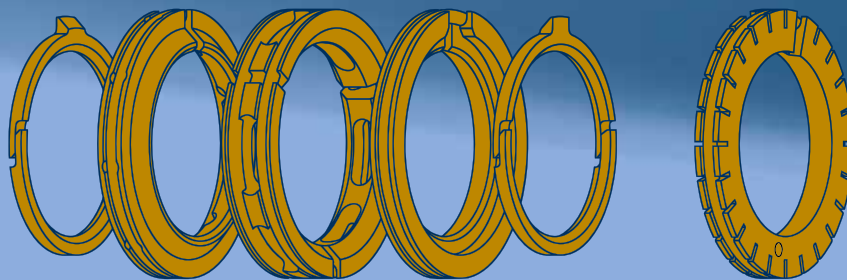


Special geometry of the scraping edges of the BOSS oil wiper packing

Two scraping edges per main wiper increase the scraping efficiency significantly. The special geometry of the angles ( $\alpha > \beta$ ) ensures that the oil still adhering to the rod during the return stroke is scraped and returned back to the crankcase.

## DESIGN AND CONCEPT

The two main scrapers are combined with the help of a tension ring in a way that the sealing surfaces are axially tight in the wiper gland, which is intended for the main scrapers (see central picture below). The axial tightness in combination with the covered separating cuts results in a tightness inherent to the system. Especially in the case of high speeds or strong pulsations of the crosshead the efficiency is highly increased, compared to that of standard oil wipers. In addition to the main scrapers and the tension ring, a pre-scraper completes the sealing design. The pre-scraper blocks the first oil flush and the remaining oil can securely be removed from the piston rod.



The BOSS oil wiper packing: two 3-piece main scrapers, a tension ring and a pre-scraper



## PROPERTIES

The Balanced Oil Sealing Solution (BOSS oil wiper packing) is an innovative design, developed and patented by STASSKOL for scraping off oil from the piston rod. The combination of two 3-piece scraping rings, one tension ring and a pre-scraper ring has the following advantages:

- » **High scraping efficiency** due to 2 scraping edges per scraper ring
- » **Recovery of oil leakage** back into the crankcase due to a special geometry of the scraping edges
- » **No direct oil passage** due to covered separating cuts at the scraping edges
- » **Gas tightness** against overflowing process gas from the intermediate distance piece
- » Use as a **buffer gas system** thanks to the high tightness of the scraper rings in combination with the wedging of the ring combination in the wiper gland
- » **Efficient oil return** through generous recesses in the tension ring
- » **Gentle handling** of the piston rod due to scraper rings made of PTFE or PEEK

## REFERENCES

Since the middle of 2015, STASSKOL has been using the design of the BOSS oil wiper packing in various applications and in compressors with a wide range of operating conditions. Here are some examples:

- » Biogas application, 2-stage compressor  
Suction pressure of the 1<sup>st</sup> stage: 3.3 bar (a)  
Discharge pressure of the 2<sup>nd</sup> stage: 32.7 bar (a)  
Average piston speed: 3.8 m/sec
- » Air application, 3-stage compressor  
Suction pressure of the 1<sup>st</sup> stage: 11.5 bar (a)  
Discharge pressure of the 3<sup>rd</sup> stage: 127 bar (a)  
Average piston speed: 5.6 m/sec
- » Natural gas application, 1-stage compressor  
Suction pressure of the 1<sup>st</sup> stage: 21 bar (a)  
Discharge pressure of the 1<sup>st</sup> stage: 60 bar (a)  
Average piston speed: 3.99 m/sec
- » Ethylene application, 2-stage compressor  
Suction pressure of the 1<sup>st</sup> stage: 1.013 bar (a)  
Discharge pressure of the 2<sup>nd</sup> stage: 7.5 bar (a)  
Average piston speed: 2.7m/sec

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