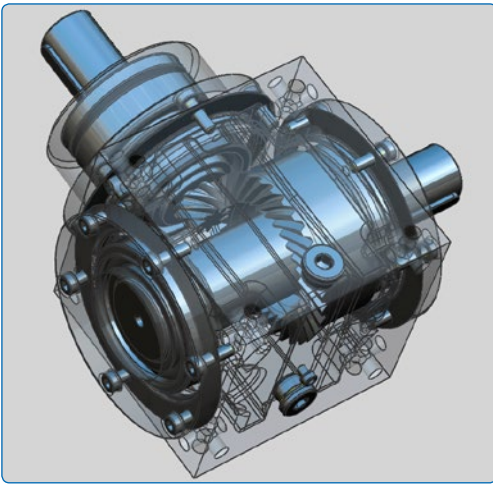


# Sustainability that pays off.



## Spiral bevel gearbox efficiency and performance



ZAE-spiral bevel gear unit – ratio 4:1

Improvements in gear efficiency and reduction in energy losses, continually play a role in the design of industrial drives. As a manufacturer of drive solutions we make every effort to meet these objectives. For this reason, in the development of our spiral bevel product, we have optimised our selection of bearings, seals and lubricants.

Compact, high speed single stage spiral bevel gears are used on many mechanical drive applications. For this type of transmission, achieving higher efficiencies can be very beneficial. Low efficiency not only results in high energy consumption of the machine but also limits the drives thermal especially in high-speed applications.

The task therefore has been to reduce the power losses of the transmission through significantly improved efficiency and while this also results in reduced running costs through lower energy consumption, our goal was also to reduce the maintenance frequency for the transmissions.

In the new design, attention was given specifically to bearings, oil seals and lubrication. Gear quality has been optimised to reduced losses and a significant improvement has been achieved by replacing taper roller bearings with angular contact ball bearing having equivalent load capacity but with reduced co-efficient of friction and lower power losses.

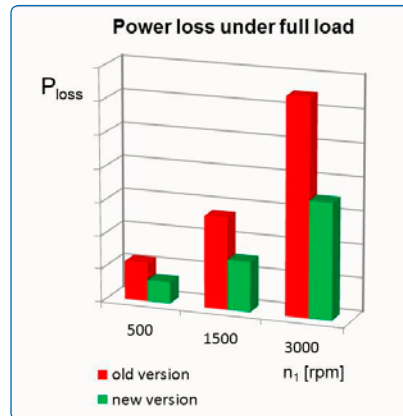
Oil seals with optimised lip pressures have resulted in a 50% reduction in frictional seal losses. The use of synthetic lubricants with optimal viscosity have provided further reduction in gearing and bearing losses. These lubricants also offer

BLUECOMPETENCE

Alliance Member



The earth's resources in terms of raw material and energy are known to be limited. Industrial companies have a high level of responsibility when developing products to protect these resources for future generations and it is our motivation to do this.



Power losses significantly reduced

increased thermal resilience and prolonged life of up to 30,000 hours.

Extensive in house full load testing of the product has proved that the power losses of the new transmissions are significantly reduced and consequently the thermal capacities have been increased by up to 50%. This increase in thermal capacity allows for the use of smaller gear units and prolongs the intervals between oil changes by up to a factor of five.

The company philosophy and objectives are to continue to design and develop products which contribute to our future sustainability.

#### Contact:

ZAE-AntriebsSysteme GmbH & Co KG  
Dipl.-Ing. Kaj Sellschopp  
Head of development and construction  
Phone: +49 40/85393-256  
Fax: +49 40/85393-249  
E-Mail: kaj.sellschopp@zae.de  
Hamburg

#### Facts:

- Revision of spiral bevel product designs
- Halving power losses by increasing efficiency of up to 98%
- Increasing transmission capacity by up to 50%
- Oil change intervals extended by a factor of 5
- Smaller, more compact gears use less material and therefore reduce costs