Reducing weight and CO_2 emissions

Environmental benefits

- Reduced fuel consumption
- Reduced CO_2 emissions
- Reduced use of hazardous elements bronze and chromium
- Made from 30% recycled material
- 100% recyclable at end of service life

With a weight savings of 40%, SKF titanium spherical plain bearings help reduce the Airbus A380's fuel usage and environmental impact, compared to conventional steel/copper beryllium bearings.

SKF titanium spherical plain bearings help the Airbus A380 shed weight to cut fuel consumption

Aircraft engineers know that in addition to improving the engine and optimizing aerodynamics, there is another sure route to higher fuel efficiency: weight reduction. Each kilogram of weight eliminated helps reduce fuel consumption as well as CO_2 emissions.

To reduce weight without negatively impacting safety or performance, SKF Aerospace proposed a solution to substitute lightweight SKF titanium spherical plain bearings for conventional steel/copper beryllium bearings on the landing gear attachment, pylon-to-wing attachment and engine support frames.

The solution was successfully implemented, and is now a standard part of the aircraft and of the manufacturer's ongoing initiative to reduce fuel use and environmental impact. After the A380 project, the solution was also developed for the A350, as well as for a number of other commercial airliners and business jets. Though installations to date have been for fixed-wing applications, the solution could be extended to other segments including helicopters.

See back for CO_2 savings calculation assumptions.

SKF BeyondZero solutions can help reduce CO_2 emissions, preserve limited resources and protect the environment from the use and spread of toxic substances. For more details, including documentation of reduced environmental impact, visit www.beyondzero.com.

Less weight = less fuel = less CO_2

As the savings calculation assumptions at right show, CO_2 reductions for body and nose landing gear arrangements alone amount to 659 tons over the 20-year life of the plane. This calculation does not include additional CO_2 equivalents for titanium spherical plain bearings for engine support frames or pylon-to-wing attachment, or for other spherical plain bearings supplied on this aircraft.

Other benefits of titanium

The ninth-most abundant element in the Earth's crust, titanium is inherently eco-friendly. Compared to conventional steel/copper beryllium bearings, the process of manufacturing SKF titanium bearings uses less of hazardous elements bronze and chromium. Additionally, at the end of their service life, titanium bearings are 100% recyclable; by contrast, the carcinogenic properties of beryllium dust create potential health risks during manufacturing and recycling.

Environmental calculation assumptions

Body and nose landing gear attachment

Number of bearings	Total weight reductions	Equivalent CO_2 reduction
12 per aircraft	110 kg	7,325 kg CO_2 per flight hour
Savings for one A380* per year		32 965 kg CO_2 equivalents
Total savings over 20 years		659 000 kg CO_2 equivalents

*Assuming 20 year product life. Calculation based on A380 technical data: weight, range, fuel capacity, etc. The distance an Airbus A380 travels per year is assumed to be 1 875 000 km. This originates from the assumptions that the distance travelled during one day is 10 000 km and that the service time during one year is 4 500 h. 4 500 h equals 187,5 days. CO_2 equivalents/kg stainless steel derived from scrap German average. The impact of stainless steel production is dependant on alloys.

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