

1 Resume

Electrical engines transform 60% of the electrical energy consumed in private households and commercial enterprises. In Denmark the annual energy loss in the electric motor bearings is estimated to be 263TJ. This project documents that the bearing losses in electric motors are reduced with 48% on average when replacing premium standard bearings with ceramic bearings (steel rings and silicon nitride balls). The theoretical energy saving potential is then 126TJ.

Measurements on discount quality bearings shows 58% energy saving potential suggesting that the average energy saving potential could be even greater since many applications are running with cheaper bearings.

The motors drives a multitude of different applications, but the main energy consumer is ventilation. Ex situ measurements on bearings experiencing loads equivalent to the ones in a ventilator shows that the energy saving potential is 43% when replacing the premium bearings in self-supporting ventilators with ceramic bearings.

During the project, certain load conditions showed 57% energy saving potential between premium bearings and ceramic bearings.