

Title: **New Dimensions in Bevel Gear Production**

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Abstract

For meanwhile more than 80 years right angle gear boxes have successfully proven their reliability for the use in marine drives. One of the prime applications was built by the Company Voith in Germany, the Voith-Schneider® Propeller. The worldwide first thruster was invented by another German company.

After the Second World War Josef Becker, the founder of Schottel Company, was focussing his activities on commercial shipping. Based on the principle of the already known outboard motors he combined two rear axle drives from trucks, blocked the differential gears and the first Z-Drive was completed (Figure 1 in paper).

The term Z-Drive is derived from the shape of the drive train. The horizontal shaft of an engine driving a vertical shaft which again drives the horizontal propeller shaft, is connected by an upper respectively a lower right angle gear box. The main characteristic of a Z-Drive is the capability to rotate the lower part 360° around the vertical shaft. This combines an excellent manoeuvrability of the ship with space saving integration as well as easy installation and dismantling. As a reference it was first installed on the motor yacht “Magdalena” driven by an engine with $P = 150$ hp input power [WITT11], [BRAB01].

Nowadays the general principle as well as the main characteristics and advantages are very much the same (Figure 1 in paper). Today’s most powerful installations are running for instance in Finnish icebreakers with an input power of $P = 7500$ kW.

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