



ZF EcoFlex

Fiber composite coupling for
electric multiple units (EMU)



World
Premiere



Innovative, lubrication-free and electrically insulated

EcoFlex is a newly developed fiber composite coupling for use in electric multiple units (EMU). The solution combines experience from the automotive sector with rail-specific requirements.

By combining the latest development processes with many years of experience, we have created EcoFlex in such a way that it meets dynamic requirements while, compared to conventional coupling systems, requiring neither oil lubrication nor oil changes. The low-maintenance, low-friction characteristics of this innovative coupling actively help reduce lifecycle costs. The use of insulating materials between the motor and gearbox hub makes the coupling design electrically insulating.

In trains, relative motion between the electric motor and gearbox means a flexible coupling is required for torque transmission. Key demands here include handling axial and radial offsets while maintaining synchronous torque transfer. Over the long term, the coupling must also withstand challenges such as track switches, uneven or dirty rails, and acceleration. These offsets are compensated by circumferentially arranged fiber packages, which ensure reliable torque transmission between the gearbox and electric motor. The core innovation of this coupling lies in these fiber packages – bundles of synthetic fibers that, working together, enable both torque transmission and the compensation of dynamic offsets between motor and gearbox.

Technical data

Weight [kg]	26.5
Speed [min⁻¹]	0 ... 6,000
Bolt circle diameter [mm]	180
Outer rotation diameter [mm]	245 – 257
Radial / axial offset [mm]	12.8 / ± 7
Nominal torque [Nm]	2,100
Slipping torque [Nm]	3,700 – 5,500

Highlights

- **Easy maintenance**
No maintenance expenditure thanks to grease and oil-free coupling
- **Universal application**
Easy integration and retrofitting possible
- **Electrical insulation**
Resistance > 1,000 MΩ due to use of insulating materials

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