

### **Long-life Gear Oils for Conventional Railway Electric Trains**

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Long-life gear oil for conventional railway electric trains is developed to reduce workloads and costs of maintenance of a gearbox. Semi-synthetic base oil, mixture of polyalphaolefin (PAO) and highly purified mineral oil, is used in the developed gear oil at the prospect of high thermostability. The additive composition is also modified to enhance oxidation resistivity. In an Indiana stirring oxidation test (ISOT) at 135°C/96hours, the developed gear oil showed enough oxidation resistivity to be used for 1,200,000 km without oil replacement at conventional railway electric trains. And the reliability at low temperature is improved as compared with current gear oil, because the viscosity at low temperature and pour-point became lower by use of semi-synthetic base oil.