

# **DRIVELINE LUBRICANTS — AUTOMOTIVE GEAR LUBRICANTS**

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Automotive gear lubricants must meet a number of requirements that can be satisfied only by specially formulated products. Most applications require gear oils that contain extreme pressure (EP) or antiwear additives to prevent wear, pitting, spalling, scoring, scuffing and other types of distress that can result in equipment failure and downtime. Depending on the application, protection against oxidation, thermal degradation, rust, copper corrosion and foaming must also be provided. In addition, the viscometrics of the finished lubricant must be tailored to both the high and low ambient temperatures in which the equipment will operate. A brief description of several of the specifications used to define the physical characteristics and performance attributes of many of today's automotive gear oil lubricants follows.

## **SAE J306**

The SAE J306 Standard defines automotive gear, axle and manual transmission lubricant viscosities.

This Standard was revised in June 2005 to incorporate the addition of two new viscosity grades to the viscosity classification. The new grades are SAE 110 and SAE 190. The need for the two additional grades centered on the wide variation in kinematic viscosity possible within the prior version of J306 for SAE 90 and SAE 140 grades. This wide range of kinematic viscosities could result in an axle being serviced with a lubricant that has a viscosity significantly lower or higher than the axle lubricant that the axle had been validated with, even though both lubricants were of the same viscosity grade. OEMs have expressed concerns with this wide range and have been instrumental in defining the narrower viscosity range.

The SAE J306 Standard has retained the key elements from the last revision (i.e. shear stability requirement and labeling guidelines). The need for the shear stability requirement continues due to the increasing use of wide-span multigrades, which may contain significant amounts of polymers. If these polymers shear in service, a decrease in viscosity and subsequent decrease in fluid film protection may ultimately lead to equipment failure. The shear stability requirement ensures that the lubricant will maintain sufficient oil film thickness during operation to protect equipment against premature wear and other types of distress.