SURFACE VEHICLE STANDARD

J306™ FEB2025

Issued 1998-03
Revised 2025-02

Superseding J306 FEB2019

Automotive Driveline Lubricant Viscosity Classification

RATIONALE

The rationale for revising Table 1 (viscosity grade classification) was to include additional viscosity grades, capturing the lower fluid viscosities used in electric drive unit applications. Also, an alternate approved test method for kinematic viscosity measurement was included.

1. SCOPE

This SAE Standard defines the limits for a classification of automotive gear lubricants in rheological terms only. Other lubricant characteristics are not considered.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J300 Engine Oil Viscosity Classification

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D445 Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)

ASTM D2983 Standard Test Method for Low-Temperature Viscosity of Automotive Fluid Lubricants Measured by Brookfield Viscometer

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ASTM D3244 Standard Practice for Utilization of Test Data to Determine Conformance with Specifications

ASTM D7042 Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)

2.1.3 CEC Test Methods

Available from Coordinating European Council, Avenue de Tervueren 188 A, Postbox 4, 1150 Brussels, Belgium, www.cectests.org.

CEC Test Method CEC L-45-A-99: Viscosity Shear Stability of Transmission Lubricants (KRL - Tapered Roller Bearing Test Rig) Shear Stability Test, 1999.

3. SIGNIFICANCE AND USE

This SAE Standard is intended for use by equipment manufacturers in defining and recommending automotive gear, axle, and manual transmission lubricants; for oil marketers in labeling such lubricants with respect to their viscosity; and for users following their owner's manual recommendations. The SAE viscosity grades shown in Table 1 constitute a classification for automotive gear, axle, and manual transmission lubricants in rheological terms only. Disputes between laboratories as to whether a product conforms with any specification in Table 1 shall be resolved by application of the procedures described in ASTM D3244. For this purpose, all specifications in Table 1 are critical specifications to which conformance based upon reproducibility of the prescribed test method is required. The product shall be considered to be in conformance if the Assigned Test Value (ATV) is within the specification.

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Table 1 - Automotive driveline lubricant viscosity classification

SAE Viscosity Grade	Maximum Viscosity cP, at Temperature of -40 °C(1)	Maximum Temperature for Absolute Viscosity of 150000 cP, °C(1)	Kinematic Viscosity at 100 °C, cSt(2) Minimum(3)	Kinematic Viscosity at 100 °C, cSt(2) Maximum
62W	1200	--	1.6	--
63W	2500	--	2.0	--
64W	5000	--	2.5	--
65W	10000	--	3.8	--
70W	--	-55	3.8	--
75W	--	-40	3.8	--
80W	--	-26	8.5	--
85W	--	-12	11.0	--
62	--	--	1.6	<2.0
63	--	--	2.0	<2.5
64	--	--	2.5	<3.8
65	--	--	3.8	<5.0
70	--	--	5.0	<6.5
75	--	--	6.5	<8.5
80	--	--	8.5	<11.0
85	--	--	11.0	<13.5
90	--	--	13.5	<18.5
110	--	--	18.5	<24.0
140	--	--	24.0	<32.5
190	--	--	32.5	<41.0
250	--	--	41.0	--

Note: 1 cP = 1 mPa·s; 1 cSt = 1 mm^2/s

(1) Using ASTM D2983.

(2) Using ASTM D445 or ASTM D7042.

(3) Limit must also be met after testing in CEC L-45-A-99, Method C (20 hours).