

## SAE Viscosity Grades For Engine Oils\*(1),(2)

SAE Viscosity Grade	Low-Temperature (°C) Cranking Viscosity <sup>(3)</sup> , mPa-s Max	Low-Temperature (°C) Pumping Viscosity <sup>(4)</sup> , mPa-s Max with No Yield Stress <sup>(4)</sup>	Low-Shear-Rate Kinematic Viscosity <sup>(5)</sup> (mm <sup>2</sup> /s) at 100°C Min	Low-Shear-Rate Kinematic Viscosity <sup>(5)</sup> (mm <sup>2</sup> /s) at 100°C Max	High-Shear-Rate Viscosity <sup>(6)</sup> , mPa-s at 150°C Min
0W	6200 at -35	60000 at -40	3.8	-	-
5W	6600 at -30	60000 at -35	3.8	-	-
10W	7000 at -25	60000 at -30	4.1	-	-
15W	7000 at -20	60000 at -25	5.6	-	-
20W	9500 at -15	60000 at -20	5.6	-	-
25W	13000 at -10	60000 at -15	9.3	-	-
20	-	-	5.6	<9.3	2.6
30	-	-	9.3	<12.5	2.9
40	-	-	12.5	<16.3	3.5 (SAE 0W-40, 5W-40, 10W-40 grades)
40	-	-	12.5	<16.3	3.7 (SAE 15W-40, 20W-40, 25W-40, 40 grades)
50	-	-	16.3	<21.9	3.7
60	-	-	21.9	<26.1	3.7

<sup>(1)</sup> Notes — 1 cP = 1 mPa-s; 1 mm<sup>2</sup>/s=1cSt

<sup>(2)</sup> All values, with the exception of the low-temperature cranking viscosity, are critical specifications as defined by ASTM D3244 (see text, Section 3)

<sup>(3)</sup> ASTM D5293: Cranking viscosity – The non-critical specification protocol in ASTM D3244 shall be applied with a P value of 0.95.

\*This document – SAE J300 revision of November 2007 – supersedes SAE J300 of May 2004. This revision becomes effective July 2010, 18 months after the revised Standard became available for voluntary compliance. Reprinted with permission from SAE J300.

<sup>(4)</sup> ASTM D4684: Note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity.

<sup>(5)</sup> ASTM D445

<sup>(6)</sup> ASTM D4683, CEC L-36-A-90 (ASTM D4741), or ASTM D5481

## API Base Oil Classification

Group	Vis. Index	Saturates	Sulfur	Other
I	≥80 - <120	<90%	and/or >0.03%	-
II	≥80 - <120	≥90%	and ≤0.03%	-
III	≥120	≥90%	and ≤0.03%	-
IV				PAO (Poly Alpha Olefin)
V				Everything Else

- Companies also use their own marketing phrases: “Group 1-1/2” and “Group 2+”
- “Group III” can be legally labeled “Synthetic”
  - The word “Synthetic” is not part of the API Classification
  - “Synthetic” is a marketing term, not a technical term

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