Petroleum products

Engine oil

SAE viscosity and API service category

SAE 5W-40 · API SM



Material illustration

Technical characteristics

Engine oil, SAE 5W-40 · API SM. SAE identifies the viscosity class and API identifies the engine service category.

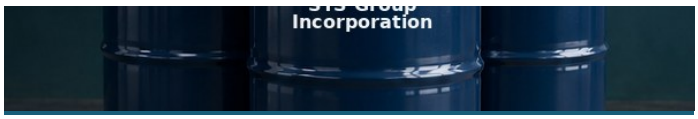
Property	Reference value	Method or source
Viscosity at 100 °C	**12.5 ≤ ν < 16.3 mm²/s**	SAE J300
Service category	**API SM**	API
Cold cranking (CCS)	**≤ 6600 mPa·s / −30 °C**	SAE J300
Low-temperature pumping (MRV)	**≤ 60 000 mPa·s / −35 °C**	SAE J300
HTHS · 150 °C	**≥ 3.5 mPa·s**	SAE J300
Kinematic viscosity	**ASTM D445**	ASTM D445

Under SAE J300 the kinematic viscosity band at 100 °C is 12.5 ≤ ν < 16.3 mm²/s. ASTM D445 measures this property. High-temperature, high-shear viscosity (HTHS) is a separate measurement. The 5W designation covers low-temperature cranking and pumpability tests.



Applications

For petrol engines whose service manual specifies SAE 5W-40 and API SM. Mixed fleets also need to account for engine type and cold-start conditions. API lists SM for petrol engines of model year 2010 and earlier, subject to the individual vehicle's requirements.



Packaging and receipt

Packs suit individual service jobs and drums suit workshops with pump dispensing. IBCs or bulk delivery can be agreed for central stores. Each container is identified by fluid and lot.

For acceptance, check the agreed specification and the certificate of analysis (COA) for the delivered lot.