

New API SN Plus (SN +) specification: Everything you need to know

Many cars that are now sold are equipped with direct-injection gasoline engines with turbo, the so-called TDGI engines. TDGI stands for: Turbocharged Direct Gasoline Injection. API SN PLUS is a new standard (!) Engine oil requirement, specially developed for TDGI engines. This requirement contains an additional element to protect the engine against 'LowSpeed Pre-Ignition' (LSPI). LSPI (a kind of 'knocking') is a known risk with these types of engines. An engine oil with the right formulation helps to prevent LSPI.

In summary:

- LSPI (Low Speed Pre-Ignition) means an unwanted and premature ignition of the fuel mixture before the spark plug sparks.
- LSPI is an extremely undesirable phenomenon, that can cause enormous engine damage within a short time, such as torn pistons.
- LSPI occurs with 'downsized' TDGI engines.
- The composition of the right engine oil, both the base oil as well as the additives, ensures that LSPI no longer occurs or significantly decreases.
- To help prevent LSPI a new 'standard' API requirement for all car manufacturers has been introduced: API 'SN Plus'.
- Several car manufacturers have had their own (OEM) engine oil requirement adapted to prevent LSPI.
- MPM offers engine oils with this new 'SN Plus' API requirement.

Advice for the workshop:

- Always use the correct, prescribed engine oil. Deviations can cause very serious engine damage.
- Be alert to signals (sounds in the low speed range) which point to LSPI and take immediate action (Note: It may be that the customer has refilled the engine with the incorrect engine oil)
- LSPI only occurs with directly injected gasoline engines and often causes serious damage to, for example, the pistons.
- LSPI is not brand-bound, so be alert.

The API is the standardization institute that mainly represents the American and Asian, (but also European) car manufacturers. In addition to the API, the ACEA (the association of European car manufacturers) is currently also assessing the addition of a standard LSPI test in the next ACEA requirement.

MPM has the products with the API SN Plus specification for you:

The current MPM portfolio contains two products with an 'SN Plus' specification:

05000DX1
MPM Motor Oil 5W-30
Premium Synthetic
DX1



05000DX1-FE
MPM Motor Oil 5W-20
Premium Synthetic
DX1 Fuel Economy



Continued on page 2

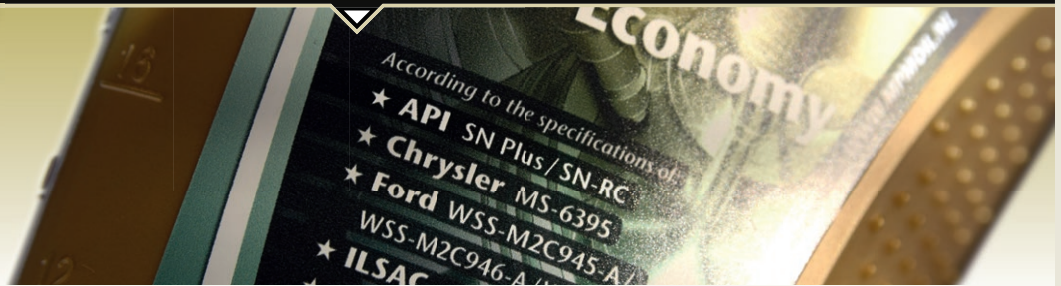


MPM International Oil Company B.V.

Cyclotronweg 1, 2629 HN Delft, The Netherlands

Phone: +31 (0)15 - 251 40 30 • Fax: +31 (0)15 - 251 40 31 • Internet: www.mpmoil.nl • E-mail: info@mpmoil.nl

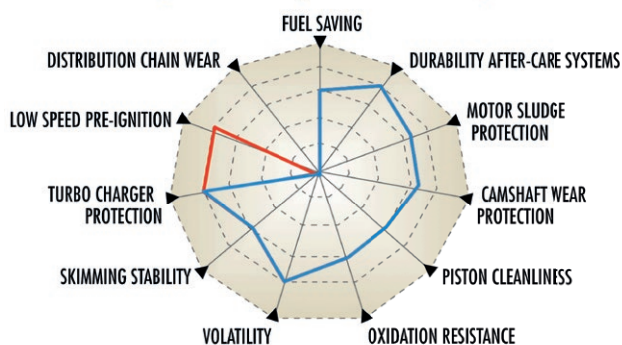
Moving things forward...



The new API SN Plus requirement really is needed, but why?

- TDGI engines, with the characteristic high power density, have a high torque at low speeds. In combination with the direct fuel injection, Low Speed Pre-Ignition, ('LSPI'), can occur. LSPI can be prevented with the right engine oil requirements.
- Car manufacturers with cars equipped with TDGI engines were confronted with the 'LSPI' phenomenon. This was extremely undesirable and immediately the need for a new standard (!) motor oil requirement arose, which provided protection against LSPI. This is the 'SN Plus' requirement. This requirement has an extra demand, which is imposed on countering 'LSPI', the so-called 'API Sequence IX test'. See diagram:

ILSAC GF-5/API SN → ILSAC GF-5/API SN Plus



- Various car manufacturers have chosen to incorporate the prevention of 'LSPI' as part of their own car manufacturer (OEM) requirement, for example GM Dexos1™ Gen 2 specification.

What is LSPI (Low-Speed-Pre-Ignition)?

Low-Speed Pre-Ignition (LSPI) is an abnormal phenomenon perceived during combustion at low engine speeds and high load. The fuel mixture ignites uncontrolled before the spark plug gives spark. The uncontrolled igniting of the fuel mixture, LSPI, can put extreme pressure on the cylinder and can be recognized by a beating sound. LSPI can cause serious damage, such as cracked pistons.

Various studies have been conducted into the cause of LSPI. A cause of LSPI has been found in the creation of 'hot spots' in the combustion chamber, when remaining oil in the cylinder comes into contact with drops of fuel.

These 'hot spots' provide ignition before the spark plug sparks. An important solution to significantly reduce LSPI, is to adapt the formulation of the engine oil. That is why the standard requirement API 'SN Plus' now exists.



How can motor oil help to prevent LSPI?

Several factors play a role in the development of LSPI, such as: the design of the engine, composition of the fuel, but also the composition of the engine oil. LSPI can for a large part be prevented if the composition (formulation) of the engine oil, and specifically the detergent additives, is adjusted. By using another type of detergent, the probability of LSPI will be significantly decreased. The application of other additives, for example Molybdenum, also clearly contributes to the prevention of LSPI. The basic engine oil performance, in this case for keeping the engine clean internally and to neutralise the acids, must always be maintained with these adapted formulations. Also the right choice of the base oil for the engine oil plays a role in the prevention of LSPI. Engine oils with this adapted formulation meet the new requirement API 'SN Plus'.

For questions:

Contact MPM Technical Product Management via support@mpmoil.nl or call 0031 (0) 15 2514030.

Sincerely,
MPM International Oil Company



MPM International Oil Company B.V.

Cyclotronweg 1, 2629 HN Delft, The Netherlands

Phone: +31 (0)15 - 251 40 30 • Fax: +31 (0)15 - 251 40 31 • Internet: www.mpmoil.nl • E-mail: info@mpmoil.nl

Moving things forward...