Nouryon

Duomeen TDO

Friction modifier

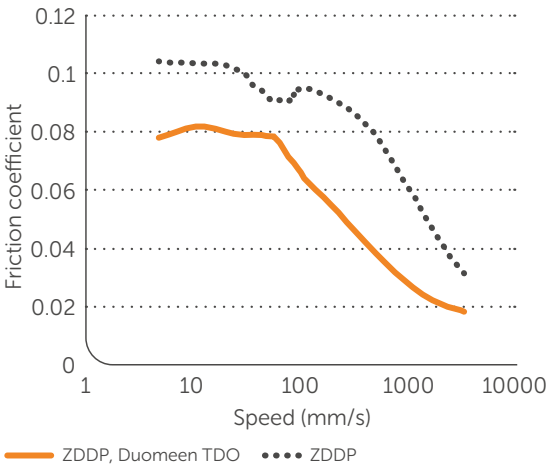
Fuel economy improvement is a key objective in the development of PCMOs and HDDEOs. One way of improving fuel economy is to use friction modifiers to reduce friction and thereby increasing the fuel efficiency. By choosing the right friction modifier, savings up to 2% of fuel can be achieved. This does not only bring a fuel saving, it also helps reducing CO_2 emissions.

Even in the high performance formulations the friction is reduced by 18% with Duomeen TDO

Friction modifiers are added to engine oils, and other fluids for automatic and manual transmissions.

MTM friction evaluation

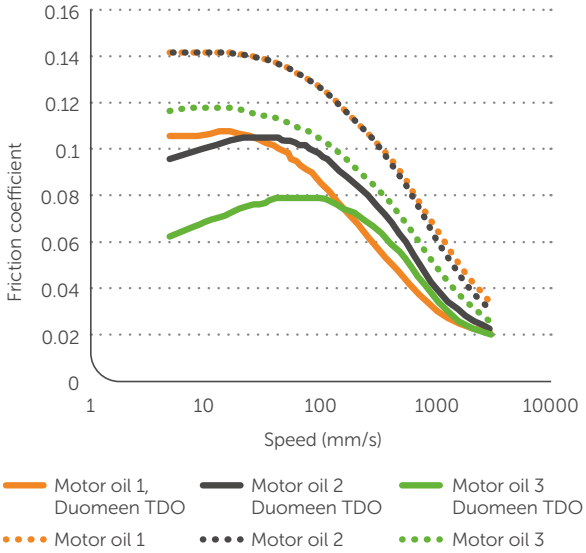
In this graph we compare the addition of Duomeen TDO in a Group II base oil which includes ZDDP. As can be seen the friction is lowered by 20% in the boundary, mixed and hydrodynamic regions thereby providing the best possible friction.



Addition of 0.5 wt% of Duomeen TDO in base oil including ZDDP. MTM test at 120°C and 50/50 slide roll ratio.

In a PCMO or HDDEO (motor oils) or in transmission oils there are many different components and chemistries which may compete for the surface. The compatibility of Duomeen TDO with other performance additives was assessed by 'top treating' three different fully formulated 'off the shelf' lubricants.

These are: low cost standard motor oil 5W30 (motor oil 1), high end motor oil 5W30 (motor oil 2) and high end motor oil 0W30 (motor oil 3).



Addition of 0.5 wt% of Duomeen TDO in 3 different fully formulated off the shelf oil. MTM test at 120°C and 50/50 slide roll ratio.

The results show that in all three fully formulated oils the friction is significantly lowered even though the motor oils already include friction modifiers. Even in the high performance formulations the friction is reduced by 18% highlighting that Duomeen TDO can be used effectively and is fully compatible with other additives. It also demonstrates that Duomeen TDO can be used as an effective 'top treat' and significant reduction in friction can be realized. The best result is obtained by top treating a 0W30 high performance fully formulated oil.

Duomeen TDO Product Data Sheet

Application	Additive for engine/transmission oil for improved fuel economy	
Use	0.3-0.75 wt% is recommended	
Typical properties	Chemical and physical data	Typical values
	Appearance	brown paste at 20°C
	Density	865 kg/m^3 at 65°C
	Flash point	>150°C
	Melting point	30-40°C
	Viscosity	80 mPa s at 60 °C
	HLB value	6 Davies Scale 0-40
	Vapour pressure	< 0.1 mm Hg at 20°C
	Pour point	35°C
	Flash point	235°C
	Melting point	30-40°C
	Equivalent mass	449
	Typical Data are based on our own measurements or derived from the literature They do not constitute part of the delivery specification	
Usage	Before adding the Duomeen TDO the product should be heated to 50°C to ensure homogeneous blending	
Storage and handling	Duomeen TDO is available in drums or bulk Duomeen TDO should be stored under cover, protected against rain and direct sunlight	
Handling and safety	A Safety Data Sheet is available	

For more information visit surfacechemistry.nouryon.com

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