

Nouryon

Ethomeen T/12

Friction modifier

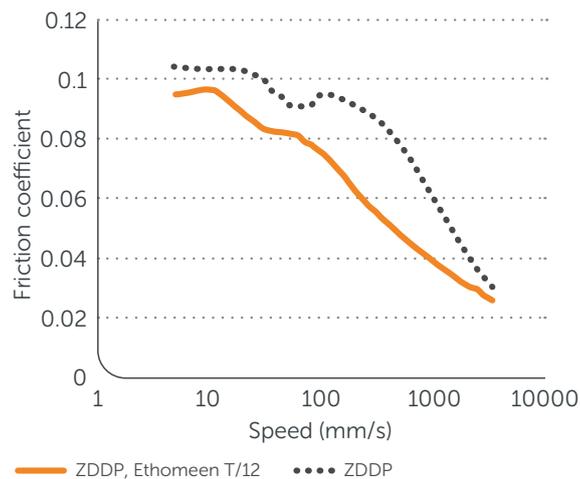
Trying to improve fuel economy is a key requirement in the development of PCMOs and HDDEOs. Friction modifiers are used in these formulations to facilitate an increase in fuel efficiency. Such friction modifiers can provide savings of 2%. This in turn equates to helping reduce overall CO² emissions.

The best improvement is achieved when top treating the 5W30 oils – a reduction of almost 60% is apparent in the mixed region

Friction modifiers are commonly used in engine oils, and are added to fluids for automatic and manual transmissions.

MTM friction evaluation

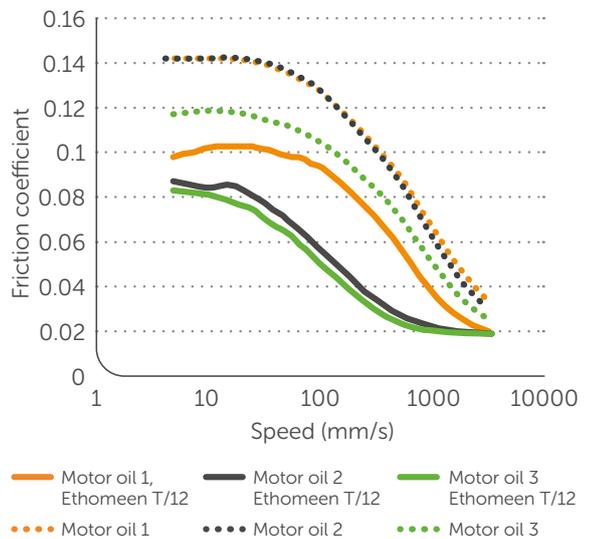
In this graph we compare Ethomeen T/12 in a Group II base oil which includes ZDDP. As can be seen there is a general lowering of the friction across all regions. A change in the friction profile where the friction moves quicker into mixed lubrication which may lead to reduced wear.



Addition of 0.5 wt% of Ethomeen T/12 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 chemistries which may compete for the surface. To evaluate the compatibility of Ethomeen T/12 with other performance additives

it has also been assessed in three different fully formulated 'off the shelf' oils. The three oils 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 Ethomeen T/12 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 reduced even though the formulations already include friction modifiers. The best improvement is achieved when top treating the 5W30 oils – a reduction of almost 60% is apparent in the mixed region. The additional of Ethomeen T/12 as a top treat to Motor oil 1 and 2 decreases the friction such that they now outperform Motor oil 3 (0W30).

Ethomeen T/12 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
	Amine number	156-165 mgKOH/g
	Primary + Secondary Amine	max 3 %
	Color	0-6 Gardner
	Moisture	max 1%
	Equivalent mass	340-360
	Tertiary Amine	min 96%
	HLB value	10.1 Davies Scale 0-40
	Viscosity	34 cP at 50°C, 29 cP at 70°C
	Pour point	32°C
	Flash point	>100°C
	Cloud point	33°C
	Melting point	29°C
	Appearance	paste at 25°C
	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 Ethomeen T/12 the product should be heated to 50°C to ensure homogeneous blending	
Storage and handling	Ethomeen T/12 is available in drums or bulk Ethomeen T/12 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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