



POSSIBLE TRANSITION TO
ULTRA LOW SULPHUR DIESEL
A SURVEY

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Environmental & technical reasons for ULSD (50ppm)

1. Reduction of SO_x and soot
2. Enabling cost effective soot filters and de-NO_x equipment like catalysts
3. Recommended / required for new generation diesel engines (i.e CCRII)



Technical barriers for ULSD

Outcome Dutch expert group:

- Effect of sulphur on lubricity to be clarified.
- Current gasoil specification to be extended, current specification describes maximum content of sulphur, no minimum, no lubricity, wide range of fuel quality supplies possible
- Cetane number to be taken in account in regard to combustion time and lacquering avoidance.
- Question: For road diesel (EN590) lubricity is specified at 460 μm maximum. What lubricity is required for existing engines in IWT?



Lubricity difference between gasoil and EN590 is tested

1. Sixteen samples throughout The Netherlands and Germany.
2. Tested by SGS according ISO standard wear scar diameter test on lubricity.
3. Tested by SGS according ASTM D2622 method on sulphur content.



Test results IWT gasoil

<u>Lubricity corrected wear scar diameter, μm (ISO 12156-1)</u>	<u>001</u> 407	<u>002</u> 426	<u>003</u> 404	<u>004</u> 407	<u>005</u> 289	<u>006</u> 419
<u>Sulphur, % wt (ASTM D 2622)</u>	0.120	0.119	0.176	0.111	0.179	0.184
<u>Lubricity corrected wear scar diameter, μm (ISO 12156-1)</u>	<u>007</u> 371	<u>008</u> 406	<u>009</u> 415	<u>010</u> 414	<u>011</u> 485	<u>012</u> 412
<u>Sulphur, % wt (ASTM D 2622)</u>	0.183	0.155	0.180	0.163	0.158	0.135



Test results ROAD diesel

Grade	GASOIL
Sample 001	BP Groene Kruisweg Rotterdam
Sample 002	Shell Aveling Hoogvliet
Sample 003	Esso Tramdijk Spijkenisse
Sample 004	Esso Rainer Samstag Ludwigshafen

<u>Lubricity corrected wear scar diameter, μm (ISO 12156-1)</u>	<u>001</u> 373	<u>002</u> 221	<u>003</u> 310	<u>004</u> 238
<u>Sulphur, % wt (ASTM D 2622)</u>	0.0005	0.0006	0.0007	0.0008





Conclusions

- More detailed specification, giving better overall quality, is required
- Lubricity of 50 ppm EN590 road diesel is better than current 2.000 ppm sulphur IWT gasoil

Further actions

- TNO research program incl. cylinder lacquering
 - Engine suppliers to advice on lubrication oil, filter replacement intervals etc.





Reports are available

Thanks for your attention



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