

**TOPAZ ENERGY LTD PRODUCT SUPPLY SPECIFICATION**

**SULPHUR FREE DIESEL AGO EN590**

IS EN 590 2004			Winter	Summer	Spec test	IP / ASTM	Note
Applicable period			16/10 - 15/03	16/03 - 30/09	Method	EquivMethod	(a)
Appearance			C & B, free from visible water and sediment at 15°C or at ambient whichever is higher.		Visual		
Density at 15°C	kg/m <sup>3</sup>		820.0 - 845.0	820.0 - 845.0	BS EN ISO 3675 BS EN ISO 12185	D 4052 or D 1298	
<i>Colour ASTM</i>		max	2.5	2.5		D 1500	
<i>Odour</i>			Marketable	Marketable			
Cetane Number		min	51	51	EN ISO 5165	D 613	(b)
Cetane Index		min	46	46	EN ISO 4264	IP380	(b)
Polycyclic Aromatic Hydrocarbons	%m/m	max	11	11	IP 391		
Viscosity at 40 °C	mm <sup>2</sup> /s		2.00-4.50	2.00-4.50	EN ISO 3104	D 445	
<i>Cloud Point</i>	°C	max	-5	+3	EN 23015	D 2500	(e)
CFPP	°C	max	-15	-5	EN 116	IP 309	(e)
Sulphur	mg/kg	max	10	10	EN 24260	IP336	
Lubricity-wear scar at 60 °C	µm	max	460	460	ISO 12156		(f)
Copper Corrosion (3 hrs at 100 °C)			Class 1	Class 1	EN ISO 2160	D 130	
<i>Hydrogen Sulphide</i>			Pass	Pass	SMS231		
Carbon Residue ( on 10% dist residue)	%m/m	max	0.30	0.30	EN ISO 10370	D 4530	
Water	mg/kg	max	200	200	EN ISO 12937	D 1744	
Total Contamination - Particulate Matter	mg/kg	max	24	24	EN 12662		
Ash	%m/m	max	0.01	0.01	EN ISO 6245	D 482	
Flash Point	°C	min	60	60	EN 22719	D 93	(c)
Strong Acid Number	mgKOH/g		Nil	Nil	D 974		
<i>Total Acid Number</i>	mgKOH/g	max	0.5	0.5	D 974		
Distillation					EN ISO 3405	D 86	
Recovered at 250 °C	%v	max	65	65			
Recovered at 350 °C	%v	min	85	85			
95% recovered at	°C	max	360	360	BS 7392		
<i>Oxidation Stability:</i>	g/m <sup>3</sup>	max	25	25	EN ISO 12205	D 2274	
<i>Existent sludge</i>	mg/100ml	max	2	2	SMS 2708		
<i>Potential – Existent sludge</i>	mg/100ml	max	4	4	SMS 2709		
Additives:							
Fatty Acid Methyl Ester (FAME)	%V/V	max	5	5	EN 14078		

*Tests in Italics do not appear in the above specification but are additional tests required by Topaz Energy*

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### **Notes**

- (a) Applicable periods refer to the distribution of fuel from the refinery. Distribution location's stocks should be managed such that from October 1<sup>st</sup> fuel supplied to end customers' meet the Winter Quality requirements.
- (b) Cetane Number (CN) determination need not be carried out if the Calculated Cetane Index (CCI) is a minimum of 51. This figure is higher than that set in EN590. But until evidence of a correlation of CN to CCI in low Sulphur fuels can be demonstrated satisfactorily the higher CCI will be required.
- (c) Min 60°C applies ex refinery, min 60 °C for supplies ex terminal.  
The figure of min 60°C is higher than that set in EN 590 (> 55 °C) but is commonly agreed minimum within the UK Oil industry for many reasons. E.g. safety, switch loading, and importantly the ability to dual or downgrade this material to GOCI and particularly the Marine market.
- (d) Static dissipater additive to be added. Target conductivity is 200 pS/m with an absolute minimum, in refinery tankage of 50 pS/m.
- (e) Cold flow improvers are permitted to achieve the CFPP specification.
- (f) To ensure adequate lubricity performance when tested by the HFRR method, a lubricity additive may be used to achieve the lubricity specification.