

CERTIFICATE OF QUALITY AVIATION GASOLINES

Grade: Avgas 91/96 UL (grade 91/98)
 Complies with ASTM D-910, Hjelmco company standard, Swedish law
 Extank C 102 Västerås Sweden
 Batch No.: 051/2010
 Certificate No.: 058

Laboratory report: PRR10-00224⁽¹⁾
 10-001271-0-RDAM⁽¹⁾
 Applies to:
 Destination:
 Date sampled: Jan 07 2010

Analyses	Test Method	Unit	Limits	Test Results
Appearance	Visual		Clear, bright and visually free from solid matter and undissolved water at ambient temperature	Pass
Knock value, lean mixture Octane number, Aviation Rating (table 7)	ASTM D 2700		Min 91,0	93,6
Knock value, rich mixture Octane number *****	ASTM D 909		Min 98,0	98,2
Knock value*, lean mixture Motor octane method number	ASTM D 2700		Report	93,3
Knock value*, research number	ASTM D 2699		Report	97,9
Tetraethyllead (TEL-B)	SS EN ISO 3830	gPb/L	Max 0,56 (Max 0,005*)	<0,001** transparent***
Colour	ASTM D 2392		Brown	
Net heat of combustion	ASTM D 240	MJ/kg	Min 43,5	43,6
Density at 15 degr. C.	ASTM D 4052	kg/m ³	Report	715,0
Initial Boiling Point	ASTM D 86	degrees C.	Report	34,8
Fuel evaporated 10 volume % at		degrees C.	Max 75	61,5
Fuel evaporated 40 volume % at		degrees C.	Min 75	98,3
Fuel evaporated 50 volume % at		degrees C.	Max 105	103,0
Fuel evaporated 90 volume % at		degrees C.	Max 135	109,0
Final Boiling Point		degrees C.	Max 170	129,0
Sum of 10 % + 50 %, evaporated temperatures		degrees C.	Min 135	164,5
Recovery		volume %	Min 97,0	97,8
Residue		volume %	Max 1,5	1,4
Loss		volume %	Max 1,5	0,8
Vapour Pressure, 38 degr. C.	ASTM D 323	kPa	38,0-49,0	45,0
Freezing Point	ASTM D 2386	degr. C.	Max (-58)	< - 100
Sulphur	ICP AES	mass %	0,05	<0,01
Corrosion, copper strip 2 hours at 100 degr. C.	ASTM D 130		Max 1	1a
Existent Gum* unwashed (160 degr. C.)	ASTM D 381	mg/100 mL	Max 6	<1
Oxidation stability, Potential gum (16 hours aging)	ASTM D 873	mg/100 mL	Max 10	<1
Lead precipitate	ASTM D 873	mg/100 mL	Max 4****
Water reaction*, Interface Rating	ASTM D 1094	as per table	Max 2	1
Water reaction*, Separation Rating	ASTM D 1094	as per table	Max 1	1
Water reaction, Volume change	ASTM D 1094	mL	Max +/- 2	0
Benzene*	SIS 155136	volume %	Max 0,10	<0,1
Electrical conductivity at + 21,0 degr. C.	ASTM D 2624	pS/m	Max 450	120
Conductivity improver Stadis 450® RDE/A/621		mg/L	Max 3	0,15
Colouring additive essentially 1,4-dialkylamino anthraquinone		mg/L	Max 3,1	0,0 ***
Colouring additive essentially benzene-azo-2-naphthol		mg/L	Max 6,0	0,0 ***
Colouring additive essentially ... azobenzene-4-azo-2-naphthol		mg/L	Max 2,7	0,0 ***
Antioxidant additive 2,6-ditertiary-butyl- 4-methylphenol RDE/A/607		mg/L	Max 24	0

*Hjelmco Oil company standard. **Swedish law for unleaded gasoline max. 0,005 gPb/L. ***Swedish law requires unleaded gasoline to be undyed.
 1) All analyses incl. lead but excluding additive concentrations performed by independent laboratories.


 Signature: Lars Hjelmberg 2010-Febr-12

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HJELMCO OIL AKTIEBOLAG.

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