

APPENDIX B
AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	A-3 TL 147-257 1	A-3 TL 147-257 2	A-3 TL 147-257 3	A-3 TL 147-257 4
Date of Spec.		Jun. 1939	Oct. 1943	Nov. 1944
Appearance		Clear, free from undissolved water, acid and solids.		
Color	Dyed blue 2.0 mg/L Sudan blau G	Dyed blue 2.0 mg/L	Dyed blue 1.6 to 1.8 mg/L Sudan blau GN	Dyed blue 1.6 to 2.6 mg/L Dye
Octane Rating	80 min.	80 min.	80 min.	80 min.
Density @15°C	0.710-0.755	0.715-0.750	0.710-0.760	0.700-0.770
Distillation				
10 vol. %	70°C	70°C	75°C	---
50 vol. %	100°C	100°C	105°C	100°C
90 vol. %	160°C	130°C	160°C	---
End Pt.	170°C max	150°C	170°C max	190°C max
Evap.	2 vol. %	2 vol. %	2 vol. %	2 vol. %
Reid Vapor Pres. (kg/cm ²)	0.5 max	0.5 max	0.5 max	0.5 max
Iodine No. (g./100 g.)	5.0 max	5.0 max	---	---
Melting Point	-60°C max		-60°C max	-50°C max
Corrosion Test	No discoloration or attack in the copper dish test.			
Residue (mg./100 c.c.)	8 max	8 max	10 max	10 max
TEL(vol %) min	0.045-0.050	---	0.045-0.050	0.045
Aromatic Content (vol. %)	---	---	25 Max	35 max
Ethylene Dibromide (vol. %)	---	---	0.019-0.023	---
Inspection	After ½ yr storage, at 3 mos inter- vals(visual)		After ½ yr storage, at 3 mos inter- vals(visual)	Monthly intervals
Comments				Ethanol con- tent of fuel =30 vol %

APPENDIX B
AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	B-4	B-4	B-4	B-4
	<u>TL 147-304</u> 1	<u>TL 147-304</u> 2	<u>TL 147-304</u> 3	<u>TL 147-304</u> 4
Date of Spec.		Jun. 1939	Oct. 1943	Nov. 1944
Appearance	Clear, free from undissolved water, acid and solids.			
Color	Dyed blue 3.6 mg/L Sudanblau G	Dyed blue 3.6 mg/L	Dyed blue 4.0-4.3 mg/L Sudanblau GN	Dyed blue 4.0-4.3 mg/L Dye
Octane Rating	89 min	89 min	89 min	89 min
Density @15°C	0.710-0.755	0.715-0.750	0.710-0.760	0.700-0.760
Distillation				
10 vol. %	70°C	70°C	75°C	75°C
50 vol. %	100°C	100°C	105°C	---
90 vol. %	160°C	130°C	160°C	---
End Ft.	170°C max	150°C	170°C max	190°C max
Evap.	2 vol %	2 vol %	2 vol %	---
Reid Vapor Pres. (kg/cm ²)	0.5 max	0.5 max	0.5 max	0.5 max
Iodine No. (g./100 g.)	5.0 max	5.0 max	5.0 max	---
Melting Point	-60°C max	-60°C	-60°C max	-50°C max
Corrosion Test	No discoloration or attack in the copper dish test.			
Residue (mg/100 c.c)	8 max	8 max	10 max	10 max
TEL(vol. %)	0.115-0.120	0.115-0.120	0.115-0.120	0.115-0.120
Aromatic content (vol.%) max	---	---	25	35
Ethylene Dibromide (vol.%)	---	---	0.050-0.053	0.050-0.053
Inhibitor (wt %)	---	---	---	---
Inspection	After $\frac{1}{2}$ yr storage visual inspec at 3 mos intervals		After $\frac{1}{2}$ yr storage visual inspec at 3 mos intervals	After $\frac{1}{2}$ yr storage visual inspec at 3 mos intervals

APPENDIX B
AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	C-3 <u>TL 147-330</u> 1	C-3 <u>TL 147-330</u> 2	C-3 <u>TL 147-330</u> 3	C-3 <u>TL 147-330</u> 4
Date of Spec.		Jun. 1939	Oct. 1943	Nov. 1944
Appearance	Clear, free from undissolved water, acid and solids.			
Color	Dyed green 0.5 mg Sudan blau GN & 0.5 mg Flurol per L		Dyed green 0.5 mg Sudan blau GN & 0.5 mg Flurol per L	Dyed green 0.5 mg Sudan dan
Octane Rating	95		95	95
Density @15°C	0.760-0.795		0.760-0.795	0.740-0.795
Distillation				
10 vol. %	---		80°C	80°C
50 vol. %	100°C		110°C	120°C
90 vol. %	---		100°C	180°C
End Pt.	180°C max		180°C max	190°C max
Evap.	2 vol. %		2 vol. %	---
Reid Vapor Pres. (kg./cm ²)	0.45 max		0.45 max	0.45 max
Iodine No. (g./100 g.)	4 max		---	---
Melting Point	-60°C max		-60°C max	-60°C max
Corrosion Test	No discoloration or attack in the copper dish test.			
Residue (mg/100 c.c)	10 max		10 max	10 max
TEL(vol.%)	0.115-0.120		0.115-0.120	0.115-0.120
Aromatic content (vol. %) max	---		45	45
Ethylene Dibromide (vol. %)	---		0.050-0.053	0.050-0.053
Inhibitor(wt %)	---		0.01	0.01
Inspection	After 3 mos storage, vis inspec at mo intervals		After 3 mos storage, vis inspec at mo intervals	After 3 mos storage, vis inspect at mo intervals

APPENDIX B

AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	VT 702 <u>TL 147-152</u> 1	VT 702 <u>TL 147-152</u> 2	VT 702 <u>TL 147-152</u> 3
Date of Spec.	June 1939		
Appearance	Clear, free from undissolved water, acid and solids.		
Color	Water white		Water white
Octane Rating	70/--		70/89
Density @ 15°C	0.715-0.725		0.715-0.730
Distillation			
10 vol. %	60-70°C		70°C
50 vol. %	85-95°C		95°C
90 vol. %	120-130°C		130°C
End Pt.	135-145°C		145°C max
Evap.	2 vol. %		2 vol. %
Reid Vapor Pres. (kg./cm ²)	0.5 max		0.5 max
Iodine No. (g./100 g.)	3.0 max		3.0 max
Melting Point	-60°C max		-60°C max
Corrosion Test	No discoloration or attack in the copper dish test.		
Residue (mg./100 c.c)	5.0 max		5.0 max
TEL(vol. %)	0/		0/0.115
Aromatic Content (vol. %)	---		15
Ethylene Dibro- mide (vol. %)	---		---
Inhibitor (wt %)	---		---
Inspection	Yearly		Yearly
Comment:	This fuel is a hydro petrol made from German lignite by the high pressure hydrogenation process of the I.G. It must not contain straight run, cracked, or polymer gasoline, anti-knock or anti-corrosion dope or inhibitor. Maximum sulfur content--0.05 wt %.		

APPENDIX B

AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	V.T. 705	V.T. 705
	<u>TL 147-153</u>	<u>TL 147-153</u>
	1	2
Date of Spec.	Sept. 1939	
Appearance	Clear, free from undissolved water, acid & solids.	
Color	Water white	Water white
Octane Rating	72/--	72/89
Density @15°C	0.725-0.740	0.730-0.745
Distillation		
10 vol. %	60-70°C	70°C
50 vol. %	85-95°C	100°C
90 vol. %	120-130°C	145°C
End Pt.	155°C	165°C max
Evap.	2 vol. %	2 vol. %
Reid Vapor Pres. (kg./cm ²)	0.45 max	0.45 max
Iodine No. (g./100 g.)	4.0 max	4.0 max
Melting Point	-60°C max	-60°C max
Corrosion Test	No discoloration or attack in the copper dish test.	
Residue (mg./100 c.c)	--	5 max
TEL (vol. %)	0/--	0/0.115
Aromatic Content (vol. %)	---	15 max
Ethylene Dibromide (vol. %)	---	---
Inhibitor (wt %)	---	---
Inspection	Yearly	Yearly
Comments	Maximum sulfur content--0.05 wt %.	

APPENDIX B
AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	V.T. 810 <u>TL 147-154</u> 1	V.T. 810 <u>TL 147-154</u> 2
Date of Spec.	Sept. 1939	
Appearance	Clear, free from undissolved water, acid & solids.	
Color	Water white	Water white
Octane Rating	70/-	67/
Density @15°C	0.715-0.725	0.715-0.725
Distillation		
10 vol %	60-70°C	65°C
50 vol %	85-95°C	95°C
90 vol %	120-130°C	135°C
End Pt.	135-145°C.	150°C max
Evap.	2 vol. %	2 vol. %
Reid Vapor Pres. (kg./cm ²)	0.5	0.5
Iodine No. (g./100 g.)	3.0 max	3.0 max
Melting Point	-60°C max	-60°C max
Corrosion Test	No discoloration or attack in the copper dish test.	
Residue (ng./100 c.c)	--	5.0 max
TEL (vol. %)	0/-	
Aromatic Content (vol. %)	--	11-15
Ethylene Dibromide (vol. %)	--	--
Inhibitor (wt %)	--	--
Inspection	Yearly	Yearly
Comments	Maximum sulfur content--0.05 wt %.	

APPENDIX B

AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	VT 100 <u>TL 147-100</u> 1	VT 100 <u>TL 147-100</u> 2	VT 100 <u>TL 147-100</u> 3
Date of Spec.	October 1943		
Appearance	Clear, free from undissolved water, acid and solids.		
Color	Water white		
Octane Rating	72/89		
Density @15°C	0.710-0.755		
Distillation			
10 vol. %	70°C		
50 vol. %	100°C		
90 vol. %	150°C		
End Pt.	170°C		
Evap.	2 vol. %		
Reid Vapor Pres. (kg./cm ²)	0.5		
Iodine No. (g./100 g.)	5 max		
Melting Point	-60°C max		
Corrosion Test	No discoloration or attack in the copper dish test.		
Residue (mg./100 c.c)	5 max		
TEL (vol. %)	0/0.115 vol %		
Aromatic Content (vol. %)	25 max		
Ethylene Dibromide (vol. %)	---		
Inhibitor (wt %)	---		
Comments:	Straight run gasolng. Max sulfur content 0.05 wt %		

APPENDIX B
AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	VT 708 <u>TL 147-158</u> 1	VT 708 <u>TL 147-158</u> 2	VT 708 <u>TL 147-158</u> 3
Date of Spec	Oct. 1943		
Appearance	Clear, free from undissolved water, acid & solids.		
Color	Water white		
Octane Rating	70 / 89		
Density @15°C	0.710-0.740		
Distillation			
10 Vol. %	70°C		
50 Vol. %	100°C		
90 Vol. %	150°C		
End Pt.	170°C		
Evap.	2 vol. %		
Reid Vapor Pres. (kg./cm ²)	0.5		
Iodine No. (g./100 g.)	4 max		
Melting Point	-60°C max		
Corrosion Test	No discoloration or attack in the copper dish test.		
Residue (mg./100 c.c)	5 max		
TEL (vol. %)	0 / 0.115 vol %		
Aromatic Content (vol. %)	15 max		
Ethylene Dibromide (vol. %)	---		
Inhibitor (wt %)	---		
Comments	Hydrogenated gaso- line. Aniline point of 55°C max. Maxi- mum sulfur content 0.05 wt %.		

APPENDIX B

AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	VT 207 <u>TL 147-157</u> 1	VT 707 <u>TL 147-157</u> 2
Date of Spec.	October 1943	
Appearance	Clear, free from undissolved water, acid & solids.	
Color		Water white
Octane Rating		72 / 89
Density @ 15°C		0.720-0.740
Distillation		
Init.		40°C
10 Vol. %		70°C
50 Vol. %		100°C
90 Vol. %		145°C
End Pt.		165°C
Evap.		2 vol. %
Reid Vapor Pres. (kg./cm ²)		0.45 max
Iodine No. (g./100 g.)		3 max
Melting Point		-60°C max
Corrosion Test	No discoloration or attack in the copper dish test.	
Residue (mg./100 c.c.)		5 max
TEL (vol. %)		0 / 0.115 vol %
Aromatic Content (vol. %)		15 max.
Ethylene Dibromide (vol. %)		---
Inhibitor (wt.%)		---
Comments		Hydrogenated gaso- line. Aniline point of 50°C. Maximum sulfur content-0.05 wt %

APPENDIX B
AVIATION FUEL SPECIFICATIONS--OTTO ENGINE

Specification Number	VT 302 <u>TL 147-150</u> 1	VT 811 <u>TL 147-155</u> 1	VT 812 <u>TL 147-162</u> 1
Appearance	Clear, free from undissolved water, acid & solids		
Color	Water white	Water white	Water white
Octane Rating	---	70 / 89	70 / 89
Density @ 15°C	0.875	0.725-0.750	0.720-0.740
Distillation			
Init.	80°C	40°C	40°C
10 vol. %	---	70°C	70°C
50 vol. %	---	105°C	110°C
75 vol. %	100°C	---	---
90 vol. %	---	145°C	150°C
95 vol. %	145°C	---	---
End Pt.	---	165°C	165°C
Evap.	2 vol %	2 vol %	2 vol %
Reid Vapor Pres. (kg./cm ²)	0.25	0.50	0.50
Iodine No. (g./100 g.)	1.0 max	3.0 max	3.0 max
Melting Point	-10°C max	-60°C max	-60°C max
Corrosion Test	No discoloration or attack in the copper dish test.		
Residue (mg./100 c.c)	5 max	5 max	5 max
TEL (vol. %)	---	0 / 0.115 vol %	0 / 0.115 vol %
Aromatic Content (vol. %)	100.0	6-15.0	15.0 max
Ethylene Dibromide (vol. %)	---	---	---
Inhibitor (wt %)	---	---	---
Comments	Max. sulfur content 0.08 wt %	Hydrogenated gasoline. Ana- line point of 52°C. Max Sul- fur content 0.05 wt %	Hydrogenated gasoline. Ana- line point of 44-54°C. Max sulfur content 0.05 wt %

APPENDIX B

AVIATION FUEL SPECIFICATIONS--DIESEL ENGINE

Specification Number	K-1	K-1
	<u>TL 147-351</u> 1	<u>TL 147-351</u> 2
Date	April 1944	
Centane No.	60 min.	50 min
Density @ 20°C	0.810 min.	0.810 min.
Boiling Range	I.B.P. about 160°C.	I.B.P. about 160°C. 95 vol % off-350°C.
Setting Point °C	-45 max	-45 max
Viscosity	1.1°E min @20°C	1.1°E min @20°C
Flash Point °C	above 50	above 50
Acid Value mg KOH/gm	0.7 max	0.7 max
Sulfur Content wt %	1 max	1 max
Ash Content	Traces only	Traces only
Corrosion Test	Negative	4 mg max
Conradson Test Wt %	0.1 max	0.1 max
Water Content	Traces only	Traces only
Storage Stability	After 1 yr inspec at 6 mos intervals	After 1 yr inspec at 6 mos intervals