

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
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OFFICE OF SYNTHETIC LIQUID FUEL  
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From Dr. H. Pier's files

T - 442

High Pressure Experiments  
Lu-wigshafen 558

W. M. Sternberg  
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COMPARISON OF INSTALLATION COSTS, IRON REQUIREMENTS AND  
QUALITY OF THE FINISHED PRODUCTS FROM COAL AND TAR

1). Hydrogenation of bituminous coal.

a) Aviation gasoline

The installation costs and requirements in materials are known for the Blechhammer project under construction for the hydrogenation of Upper Silesian coals,

Production	180,000 te/ye of aviation gasoline.
Iron requirements	190 - 200,000 te
Capital investment	200 - 210 mill. Mark
Quality	Bituminous coal aviation gasoline, equal to VT 705

b) Aviation gasoline from fuel oil.

Installation costs and requirements in construction materials are also known from the designs of the hydrogenation installation and low temperature-carbonization plant under construction in Blechhammer, for Upper Silesian coal.

Production	220,000 te/ye aviation gasoline 250,000 te/ye fuel oil 50,000 te/ye carbonization fuel oil
Iron requirements	310,000 te *
Capital investment	443 mill. Mark *

\* ) including low temperature carbonization of bituminous coal.

Quality	Fuel oil	Aviation gasoline
d <sub>20</sub>	1.079	almost equal to
Visc.	19.9° E/50°E	VT 705
Xylene insolubles	0.01%	
Carbon residue	1.3	
Flash point	180°	
Lower heating value/li.	9900	

## 2). Low Temperature Carbonization of Bituminous Coal.

### a) Method of distillation for fuel oil.

There exist some more accurately performed calculations for the L.T.C. plant under construction at Blechhammer: the Lurgi system with gas flushing. The costs and the iron requirements for this plant agree with the data for the Auschwitz project which have been worked out in the mean time, bearing in mind the difference in the size of production, as well as the fact that in Blechhammer the low temperature carbonization will be done on briquettes, and the cost of briquetting is included in the figures, while in Auschwitz bituminous coal is to be carbonized directly.

Installation:	Blechhammer	Auschwitz
Production, tar (including gasoline)	184,000 te/ye	77,000 te/ye
Capital requirements	26 mill. Mk including coal storage, bins and conveying, but no power plant, power distribution and auxiliary plants.	21.3 mill. Mk including power production, distribution and auxiliary plants.
Iron requirements	20,000 te	19,200 te

The tars on distillation form the following products:

Fuel oil	50,000 te/ye	46,000 te/ye
H.T. Tar (Heissteer)	45,500 "	23,000 "
Gasoline	8,500 "	8,000 "

The properties of the fuel oil are as follows:

d <sub>20</sub>	1.000
Viscosity	7.8° E/20°E
carbon residue	2.0%
Pour point	abt. -13°
Lower heat value/li	8,950

The tar can be hydrogenated, with the following results, if computations are based on an aviation gasoline production of 180,000 te:

Production	180,000 te/ye aviation gasoline
Yield	63
Installation cost	155 mill Mk.
Iron requirements	130,000 te
Quality	somewhat lower than VT 705

The tar, hydrogenated to fuel oil, would not produce a normal fuel oil because of the high paraffin content, and it would deviate from the OKM specification either in specific weight or in the pour point.

b) Hydrogenation.

If the total flushing gas-low temperature tar of good quality of a composition

4%	solids
20%	asphalt
30%	-325°C

be hydrogenated to aviation gasoline, the yield will amount to about 64%. For a production capacity of 180,000 te/ye of aviation gasoline,

the construction costs will be	145 mill. Mk
the iron requirements	120,000 te.

The quality of the aviation gasoline produced will be similar as in the hydrogenation of the tar, and somewhat poorer than VT 705.

/s/: Hübner  
Oettinger  
Becker