

Schwarzheide, 5/17/43

DISCUSSION OF KOPPERS GAS PRODUCERS

1. Production of Fuel Gas.

Mr. Kaden has stated about fuel gas production, that it had been decided to introduce no changes in the Schmalfeldt installation because any changes decided upon will merely be compromises; the gas producers must be designed for powdered fuel gasification. We have accordingly been asked to submit bids for a usual design. An engineer's report will then be handed us on the design of this installation. No approval by the Government is here required, as has been found in a discussion with Director Altpeter.

A gas of high heating value is needed for the heating of the Cowper unit, and efforts must be made to operate the Schmalfeldt unit as originally intended, i e., by gasifying powdered grude with a mixture of rinsing gas and steam. Getting a gas with a heating value of about 2000 heat units is expected, and it is to be used as a fuel gas.

We advised, that such a construction would be attempting no worthwhile objective, and that

- 1) such a gas would consume much more heat than it would produce, and
- 2) carbon will be but partially gasified; but this did not interfere with the program of these gentlemen. This experiment will have to be run at all costs. However, we already are in position today to forecast the results on the strength of our experience. We can and shall prove in our Rheinpreussen installation to the gentlemen involved the impossibility of the method.

Schmalfeldt in Lützkendorf is the originator of these tests. The fact, that the producer is fed with the Lützkendorf brown coal, and that the solid carbon is there utterly unattacked, is kept completely out of consideration. The Schmalfeldt installation is nothing more than a distillation and cracking unit. Solid carbon is carried out practically unattacked into the dump. In Ruhland, powdered grude i.e. a product dumped in Lützkendorf is to be substituted for powdered brown coal. These arguments can not be seriously contradicted, and it was decided to have the practical tests run regardless of the results, and the statement modified by saying, that the producer will not be used for gas production, but for reforming the fuel gas.

It pays therefore to discuss the whole question, because we would prefer to build a normal unit of our system, instead of rebuilding the Schmalfeldt installation.

We shall accordingly expect a request for that kind of an installation.

2) Production of Synthesis Gas.

Brabag has received the commission to design a Fischer Tropsch installation. It is to be located in Upper Silesia.

Raw material:	Upper Silesian soft coal, including grude-coke.
capacity/hour	100,000 m <sup>3</sup> CO + H <sub>2</sub> (8,000 hours/year)
CO : H <sub>2</sub>	1.65 : 1

The gas is to be used for intermediate pressure synthesis with iron catalyst, very likely to produce Katsch (?). The latter is an assumption based on the very great interest taken in this installation by Dr. Keppler, whose special field we know to be the production of edible fats.

The gentlemen at the Ingenieurtechnischen Zentrale are fully conversant with our process as a result of discussions carried out for the Zeitz addition, and we need not include here many detail. We have on our part stated, that no special requirements need be made with regard to the coal. The coal must be readily ground, i.e., abt. 75% must pass through 4900 mesh (- 175 mesh, U.S.). The required gas composition with this ratio of CO + H<sub>2</sub> has been repeatedly obtained in our Rheinpreussen pilot plant. The Gas Company has made complementary tests on condensable hydrocarbons as well as on the sulfur content. This experience has enabled us to give accurate information on which to base subsequent design and to claim the ability to produce gas of the following quality:

Raw Powdered Coal:	Water	1.95%
	Ash	8.75%
	V.M.	22.3%
	Fixed Carb	77.7%
	Heat units	<u>7650 H.U./kg</u>

Ratio CO : H<sub>2</sub> in gas produced 1.6 : 1

Composition of the gas:

CO <sub>2</sub>	11.0%
CO	54.0%
H <sub>2</sub>	34.0%
N <sub>2</sub>	1.0%

88.6%

Concentration of CO + H<sub>2</sub>

Minimum heating value	per nm <sup>3</sup> 5y. Gas	2505 H.U.
Amount of gas	per kg raw powd. coal	2.10 nm <sup>3</sup>
O <sub>2</sub> consumption:	per kg raw powd. coal	0.57 "
	per nm <sup>3</sup> synth. gas	0.27 "
CO <sub>2</sub> consumption	per kg raw powd. coal	0.14 "
undergrate firing	" " " " "	350 H.U.
Steam production, 16 atm, 350° C	" " " " "	0.71 kg
Steam consumpt. 3 atm, sat.	" " " " "	0.40 "

This represents our normal construction. However, the heater unit is too large, and we ordinarily use one heater for two gasifiers and coolers as well as desintegrators. Such a unit would produce 20,000 m<sup>3</sup> of a gas of the above character.

The discussion of the number of aggregates to be ordered has assumed great latitude. We have agreed that a total of six aggregates should be built, one of which is to be used as reserve and for emergency. The price quoted was 2.7 mill. RM per aggregate. This means 16.2 mill. for the six aggregates. The cost of gas given by us is 1.7 Pfg, based on the following:

1)	1 te ground powdered coal, at the bin	RM. 14.00
2)	1 nm <sup>3</sup> 95% oxygen	" 0.025
3)	1 8-hour labor shift	" 10.00
4)	1 kwh power	" 0.02
5)	1 m <sup>3</sup> clarified and cooled circulating water	" 0.025
6)	1 m <sup>3</sup> make-up water	" 0.025
7)	1 m <sup>3</sup> boiler water	" 0.25
8)	10 <sup>6</sup> kcal heat gas	" 4.75
9)	1 te steam, 16 atm	" 3.00
10)	1 t steam, 3 atm	" 1.50
11)	Amortization and interest	12%
12)	Maintenance and repair	2%

The Ingenieurtechnische Zentrale is in position to start on the preliminary designs. We have been asked to present a written bid in greatest detail, and if possible to supplement it at least with data on coal preparation and water treatment (the data on which will be communicated by telephone). We are also asked to give information on the sulfur content and the composition of the sulfur compounds in the gas, based on tests made at Rheinpreussen.

/s/ Sect. I/O.S.

W.M. Sternberg

(signature undecipherable)