

Essen, April 13, 1942.

COST COMPARISON OF THE WINKLER AND THE KOPPERS
 POWDERED COAL GASIFICATION PROCESSES.

(Per nm^3 of raw water gas.)

Construction costs, for the production of 645,000 nm^3
 ($\text{CO} + \text{H}_2$) in 24 hours, corresponding to 760,000 nm^3 water gas
 from Koppers producer, and 840,000 nm^3 water gas from Winkler.

Koppers installation, incl. reserve Cowper	RM 5,300,000
Winkler installation	3,000,000

Koppers Installation:

1. Amortization and interest, 15%	Pfg 0.2870/ nm^3
2. 0.16 nm^3 oxygen @, pfg 3.1	0.4960 "
3. 0.539 kg coal, RM 9.-/te	0.4770 "
4. 24 man-hour labor, a day @ RM 2.-/hr, incl. superv.	0.0560 "
5. 0.120 kg outside steam, @ RM 1.50/te	0.0180 "
6. 0.035 kwh power, 1.5 pfg	0.0525 "
7. 20 li. circulating water, @ pfg 2.0/ m^3	0.0400 "
8. 0.53 li. feed water, @ pfg 20.0/ m^3	0.0105 "
9. 650 kcal outside heat, @ RM 1.-/1 million H.U.	0.0650 "
10. 2.5% cost of repairs, referred to construction costs	0.0477 "

Total

Pfg 1.5497/ nm^3

= pfg. 1.82/ nm^3 $\text{CO} + \text{H}_2$

Winkler Installation:

1. Amortization and interest, 15%	Pfg 0.1470/nm ³
2. 0.237 nm ³ oxygen, @ pfg 3.1	0.7350 "
3. 0.561 kg coal, @ RM 9.-/te	0.5050 "
4. 18 man-hour labor a day, @ RM 2.-/hr, incl superv.	0.0343 "
5. 0.028 kwh power, @ pfg 1.5	0.0420/nm ³
6. 17 li. circulation water, @ pfg 2.0/m ³	0.0340 "
7. 0.622 li. feed water, @ pfg 20.0/m ³	0.0125 "
8. 3% repair costs on construction costs	0.0294 "

Total production costs 1.5392/nm³

$$= 2.11 \text{ Pfg/nm}^3 \text{ CO} + \text{H}_2$$

We have been told in the discussion with Mr. Mott that a comparison of operating costs by the Koppers and Winkler processes had only theoretical significance, because the brown coal gasification is predicated for both processes, although it is impossible to run a Winkler generator with it. For this reason, Dr. Mott, when compiling data for the Winkler generator and deriving the cost per m³ water gas or per m³ CO + H₂ based them on grude coke utilization, while the Koppers data were compiled on the basis of use of brown coal fines. The cost of the raw material, whether powdered brown coal or grude coke was set the same in the computations, or RM 9.-/te.

The comparison is therefore not only theoretically inaccurate, but actually wrong, being based on different fuels.

W. M. Sternberg.