

Mr Wiley

T-456

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
COAL TO OIL DEMONSTRATION BRANCH
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From Dr. Pier's Files

2/3/41

OPERATING COSTS AND TOTAL PRODUCTION COSTS FOR THE PRODUCTION
OF A -165°C DHD GASOLINE IN PLANTS OF DIFFERENT CAPACITIES

The results are presented in the tables as well as graphically.

	RM/te DHD gasoline, endpoint -165°C, 50% by volume of aromatics				
	1	2	3	4	5
Capacity, tc/ann (finished product) te/te	1840 530	27000 2250	50000 4170	140000 11650	140000 11660
Location of plant	Ludwigshafen still 504	Ludwigshafen still 807/802	Oppau New Inst.	Oppau	Politz
	RM/te	RM/te	RM/te	RM/te	RM/te
I. Oper. costs	267.00	53.46	93.30	21.72	20.02
II. Genr. costs	64.85	57.95	23.21	16.25	16.19
III. Prod. costs ¹⁾	55.40	55.40	55.40	55.40	55.40
Total costs ²⁾	387.25	166.81	112.57	93.37	91.61
Costs of the finished product	387.25	366.81	312.57	293.37	291.61

1) Case 1 (see graph) are valid for the cost price of the feed of 200 RM/te, the case 2 for the cost price of 400 RM/te for the feed.

2) The cost of the feed in this case is only contained in the product loss in gasification + loss

The comparative cost estimated were made for the following cases:

- 1) The production of 153 te/mo = 1840 te/ann of DHD gasoline in the 1000 liter converters of the stall 504. The actual monthly expenses were used for the operating costs, as entered on the stall account sheet. The general costs are the construction costs assumed as 100,000 Mk, with an amortization in 1 year.
- 2) The production of 2,250 te/mo = 27,000 te/ann of DHD gasoline in the new installation in stalls 301/302 with 10 cbm converters. The power consumption is that estimated in the declaration for the construction permit; the price of power is based on the prices at Ludwigshafen-Opau. An amortization cost of 1.3 million RM per year is included in the general costs, which form additional costs in comparison with the present erection of the plant on the new Opau property.
- 3) The production of 4,170 te/mo = 50,000 te/ann of DHD gasoline at the new Opau property with 19 cbm reaction spaces. The power costs here used are 40% of the costs in case 4. The installation costs have been assumed to be 7.2 mill. RM, with a normal amortization in 10 years.
- 4) Production of 11,600 te/mo = 140,000 te/ ann of DHD gasoline, similar to the production in Stettin-Pölitx, but on the assumption of the power prices charged in Ludwigshafen-Opau. The differences consist in the following:

High tension current, Ludw.-Opau:	1.5 pfg/kwh	Stettin:	2 pfg/ kwh
High pressure steam	5.10 M/te	"	2.5 M/te
Low pressure steam	4.- "	"	2.- "
Power gas	1 pfg/cbm	"	0.5 pfg/cbm
Water	0.8 "	"	1.0 "

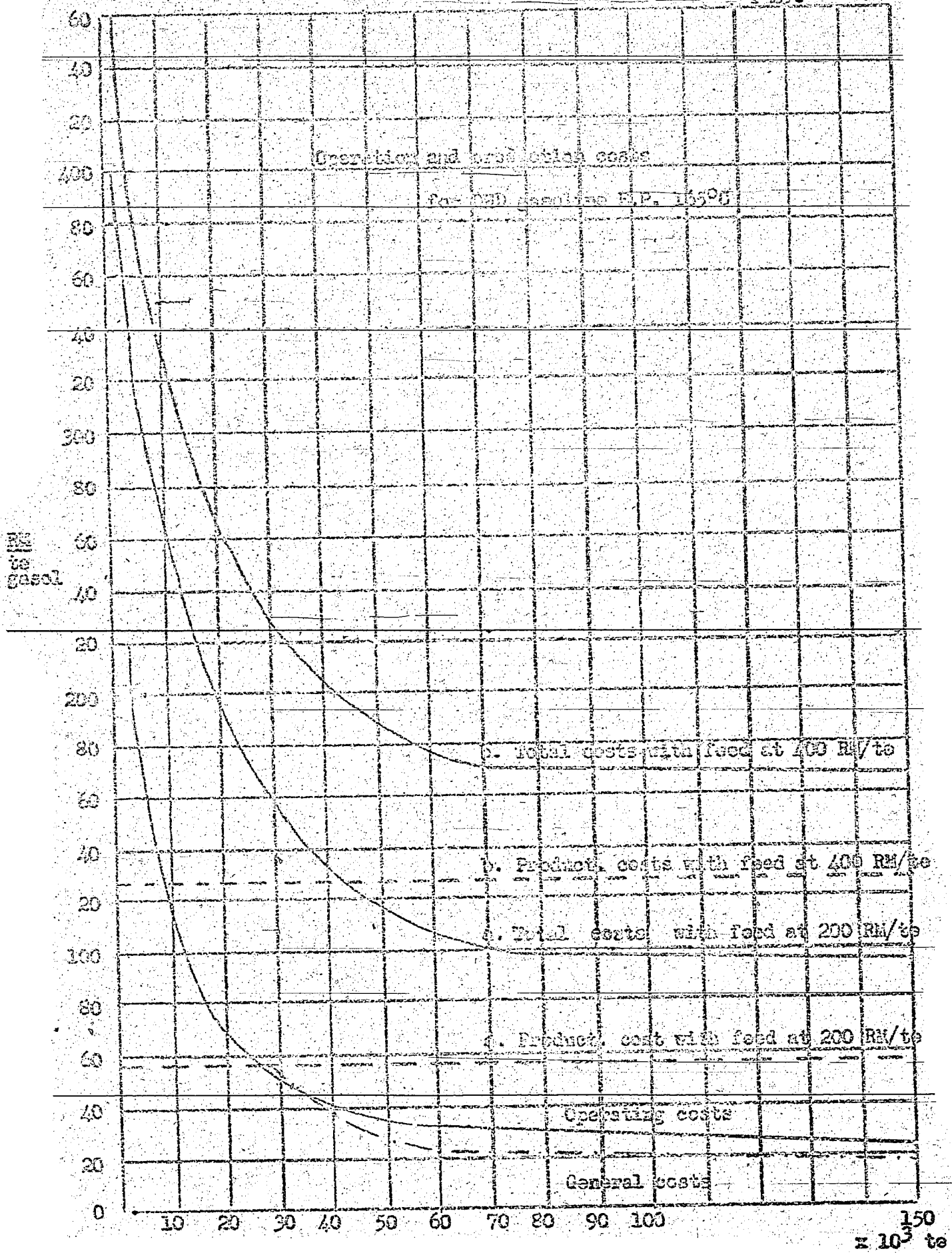
The other costs are used as estimated for Pölitx.

- 5) The production of 11,600 te/mo = 140,000 te/ann in Stettin-Pölitx. The power consumption is that furnished by Mr. Plauth, Engineer in Charge, in his tables. The installation costs are based on 13,725 mill. with an amortization in 10 years.

The product costs have been assumed to be the same for all cases. It is assumed that 75% of the injection is obtained as C₁-free catchpot bottoms, with a residue of 5% of heavy gasoline, 10% in the catchpot, in the case of Buranadan gasoline. A 190 Mk/te credit is given for this residue. The feed is computed at a price of

- a) 200 Mk/te
- b) 400.- Mk/te

/s/ Sussenguth
Simon.



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Operation and Reworking Costs for the Production of -165°C DHD Gasoline in Ludwigshafen-Oppeu, with Different Installation Capacities

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	Costs/month:					Costs/1000 finished gas, 165°C, 50% arom. by volume				
	1	2	3	4	5	1	2	3	4	5
Capacity of plant, te/ann finished product	1840	27000	50000	140000	140000	1840	27000	50000	140000	140000
Reaction volume of DHD converters	935 li.	10 cbm	19 cbm	54 cbm	54 cbm	935 li.	10 cbm	19 cbm	54 cbm	54 cbm
Location of Plant	Lu-Stall 504	Lu-Stall 801/802	Op-New Plant	Op.	Steppin-Politz	Lu-Stall 504	Lu-Stall 801/802	Op-New Plant	Op.	Steppin-Politz
I. Operation Costs										
Wages (1.65 RM/h)	7 603.--	20 500.--	24 200.--	48 250.--	48 250.--	49.70	9.12	8.20	4.14	4.14
Salaries	3 328.--	4 000.--	4 000.0	5 000.--	5 000.--	21.75	1.78	0.96	0.43	0.43
Power										
High Tension (1.5 pf/wh)	375.--	15 000.--	11 200.--	28 000.--	28 000.--	2.45	6.66	2.69	2.40	2.40
Low Tension (2 ")	56.--	700.--	1 550.--	3 370.--	3 370.--	0.37	0.31	0.37	0.33	0.33
High Pr. Steam (5.10 pf/wh)	3 808.--	14 700.--	17 000.--	42 500.--	42 500.--	57.80	6.53	4.08	3.64	3.64
Low " Steam (4 ")	1 000.--	7 350.--	930.--	2 330.--	2 330.--	6.54	3.27	0.22	0.20	0.20
Power Gas (1.0 pf/wh)	2 620.--	17 900.--	7 120.--	17 800.--	17 800.--	17.13	7.96	1.71	1.53	1.53
Water (0.8 ")	100.--	1 110.--	1 150.--	2 880.--	2 880.--	0.65	0.49	0.28	0.25	0.25
Oct. Costs for 12 months (7.35 RM/kg 7350)	630.--	6 600.--	12 500.--	36 750.--	36 750.--	4.12	2.94	3.00	3.15	3.15
Materials	150.--	1 000.--	1 710.--	4 800.--	4 800.--	0.98	0.44	0.41	0.41	0.41
Nitrogen (2.4 pf/cbm)	1 142.--	2 400.--	2 400.--	1 000.--	1 000.--	7.46	1.07	0.58	0.09	0.09
HR, Tank Cars	3 000.--	4 000.--	-	-	-	19.60	1.78	-	-	-
Rental of Tanks										
Repairs	12 000.--	25 000.--	45 000.--	60 000.--	60 000.--	78.45	11.11	10.80	5.15	5.15
General Costs	40 812.--	120 260.--	138 760.--	253 180.--	233 305.--	267.--	53.46	33.90	21.72	20.02
II. General Costs										
General 2.5% of oper. costs	1 020.--	3 080.--	3 469.--	6 520.--	5 833.--	6.67	1.27	0.83	0.56	0.50
Management 3% of inst. cost	250.--	9 500.--	18 000.--	34 300.--	34 300.--	1.64	4.22	4.32	2.94	2.94
Interest 3% " "	250.--	9 500.--	18 000.--	34 300.--	34 300.--	1.64	4.22	4.32	2.94	2.94
Amortization of " "	8 400.--	108 300.--	60 000.--	114 400.--	114 400.--	54.90	48.14	14.40	9.81	9.81
III. Production Costs	9 920.--	130 380.--	99 469.--	189 520.--	189 633.--	64.85	57.95	23.87	16.25	16.19
Gasification + Loss (kg @ 20 fig.)	10 700.--	157 500.--	292 000.--	816 000.--	816 000.--	70.--	70.--	70.--	70.--	70.--
(Production factor 1.35)										
Motor gasoline credit from residues @ 15 fig.	Cr. 1 255.--	Cr. 18 490.--	Cr. 24 200.--	Cr. 95 600.--	Cr. 95 600.--	Cr. 8.20	Cr. 8.20	Cr. 8.20	Cr. 8.20	Cr. 8.20
By @ 558 credit 200 cbm @ 800 h.u./te gasoline	Cr. 978.--	Cr. 14 400.--	Cr. 26 680.--	Cr. 74 620.--	Cr. 74 620.--	Cr. 6.40	Cr. 6.40	Cr. 6.40	Cr. 6.40	Cr. 6.40
IV. Total Costs	8 467.--	124 610.--	231 120.--	645 780.--	645 780.--	55.40	55.40	55.40	55.40	55.40
	59 199.--	375 250.--	469 349.--	1 088 480.--	1 068 718.--	387.25	166.81	112.57	93.37	91.61

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