

Experiments for Improving
Paraffin Production in Zeitz
Ludwigshafen, 9 November 1942

Besides low filter yield in the deparaffining plant at Zeitz, a second difficulty, that of deterioration of the paraffin in the transition from the former MTH-conditions (Medium temperature hydrogenation) to the TTH operating method (low temp. hydr.) was observed. It is probably difficult to find an operating method (Fahrweise) satisfactory all around, because with TTH, even though the paraffin content of the product is high enough to meet the required production and the filter yield, according to Zeitz reports, is satisfactory and sufficient for working up the production, the paraffin is too oily for oxidation in the fatty acid plants and, furthermore, high pressure hydrogenation produces too little diesel oil. On the other hand, with MTH the paraffin is good, the filter yield is sufficient for processing the production, although below the theoretical, and diesel oil production is satisfactory, but most of the machine oil production is eliminated, which is unsatisfactory to the Reich Economics Ministry, and the paraffin in the cold catch pot residue is not enough to cover requirements.

The too low filter yield and the insufficient de-oiling of the paraffin in Zeitz are phenomena entirely independent of each other. It may be expected, however, that with an improved filter yield, the paraffin can also be better de-oiled. For this purpose, the following experiments are under way or projected:

Ludwigshafen is conducting small scale tests to find out whether the quantity of filter aid used in Zeitz is sufficient, whether the filter aid is not partially destroyed in the recycling or is too greatly deteriorated by harmful by-products produced in distillation, whether a greater make-up filter aid addition will not produce material improvements in the recycle operating method, and whether other filter aids could be used in place of Paraflow.

Large scale experiments are to be made in Zeitz on the effectiveness of filter aid as soon as the two new filter units are installed. In addition, Ludwigshafen suggests that the kind and quantity of filter aid be varied now during the operation of the present filters and that dosing pumps be installed for this purpose, whereby much time could be saved, compared to the present method of admixture to large tanks.

Experiences in Lützensdorf have shown that the volume of the filter cake can be very much reduced by adding the optimum quantity of filter aid to distillate oil, whereby the porosity of the cake for wash-propane is considerably increased. The application of a strong propane wash has recently produced exceptionally favorable results with residue oil. To maintain a thin cake the filter rotation can also be increased. By this method former filter yields were considerably increased in the processing of residue oil. With distillate oil the effect is satisfactory even though not quite as great.

Accordingly, the following is to be tried in Zeitz, where the filter cake tends to dry out and form cracks, which make the effectiveness of a propane wash questionable:

increase the filter r.p.m.,
strengthen the propane wash,

~~if need be by installing other spraying devices, for which Ludwigshafen has already made suggestions,~~
and decreasing the run-off of the wash filtrate.

Furthermore, an additional propane drying unit is to be installed, based on past experience that the washing nozzles are easily plugged by ice crystals. An increase in the propane wash capacity there was made possible only by the installation of such a drying unit.

The problem of improving the paraffin, which has been unsuitable for oxidation to fatty acids, has been examined in two directions. First, subsequent refining in Ludwigshafen has shown that satisfactory paraffin may be obtained thereby, i.e. that the TTH-paraffin is inherently good and made inferior only by the high oil content, which may be considered an argument for a simultaneous improvement in the paraffin by an increase in the filter yield, be it by means of filter aid, stronger propane wash, or both.

On the other hand, refining the TTH-paraffins with H_2 under pressure has been investigated in small scale experiments in Ludwigshafen. It was found that with catalyst 7846W a good oxidizable paraffin can be obtained with a max. loss of 20% in paraffin. An experiment on a semi-industrial scale for more accurate tests is proposed for Ludwigshafen in November. Other small scale experiments are under way to determine whether the use of catalyst 7846W, in place of catalyst 5058, already causes such an improvement in the cold catch pot product (Abstreifer) in the TTH operating method that subsequent paraffin refining becomes superfluous. With positive results, we could then run directly to the greatest possible lubricating oil and paraffin yield in the TTH process.

According to statements made by Dr. Altpeter in the discussion in the Reichsamt on the 1 October 1942, the paraffin requirement will reach 5700 t/month on completion of the fatty acid plant at Heydebreck, namely:

1700	t/month	at	Oppau
1700	"	"	Magdeburg
2300	"	"	Heydebreck

Of this, 3300 t/month is to be supplied by Zeitz and 1500 t/month by Espenhain, or a total of 4800 t/month, so that even with the full Zeitz capacity there would be a deficiency of 900 t/month of paraffin.

Therefore, it appears advisable in any case to investigate the possibility of paraffin production in German petroleum refineries very closely, since an estimated 50000 t/ann, corresponding to 4000 t/month, of paraffin could be recovered from the paraffinic residue (Gatsch) from light oils. In the U.S.A. all paraffin is produced from paraffinic residues from petroleum. In Germany, the petroleum industry had, up to the

present time, concerned itself solely with deparaffining for the purpose of lubricating oil production and was not interested in de-oiling the paraffinic residue. With the large quantities of paraffin recoverable from the paraffinic residue in the oil refineries the examination of this problem must be considered very urgent.

On the other hand, Zeitz has long ago planned to enlarge its plant by installing more filters in case the measures discussed should not be entirely successful. This plan was frustrated by the fact that the iron required for filters 11 and 12 has not been made available until just recently, while the building permit for filters 13 and 14 has not yet been granted. Furthermore, Brabag proposes to ask for a building permit for 6 additional filters. It appears proper to order these filters in any case, because, if full production in Zeitz can be achieved in some other way, they can be used to advantage in deparaffining plants in the petroleum industry, for example.