

RHENANIA OSSAG A.G.
HAMBURG—GERMANY

FUELS AND LUBRICANTS

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BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE

RHENANIA OSSAG A.G.

HAMBURG - GERMANY

FUELS AND LUBRICANTS

October 1st - 31st 1945

Reported by:-

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J.G. Withers, British, Ministry of Fuel and Power.

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Fuels and Lubricants

British Intelligence Objectives Sub-Committee
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SUMMARY.

Data are given on the activities of the various refineries operated by the Rhenania-Ossag, which include their capacities, the crudes processed and the range of finished products.

Answers to a specially prepared questionnaire are included; these answers were prepared by appropriate members of the Rhenania-Ossag organisation and cover the following fields: aviation fuels, detonation research, gas turbine fuels, motor fuels, diesel fuels, fuel oils, lubricants of all types, and special products.

Specifications for many of the products are given.

2. INTRODUCTION.

The information given in this report was obtained in the course of a visit of a combined British/American team to the Hamburg area during the period October 1st to 31st 1945.

The individuals responsible for the presentation of the information and data were :-

Aviation Fuels	Obering. Rössig
Motor Fuels	Dipl.-Ing. Rumpf
Diesel Fuels	
Automotive + Aviation	Obering. Rössig
Marine (Specifications)	Herr Pollnow
Lubricants	
Aviation	Obering. Rössig
Automotive	Dipl.-Ing. Rumpf
Marine (Specifications)	Herr Pollnow
Transmission	Dipl.-Ing. Beuerlein
Hydraulic Oils	Dr.-Ing. Seeles
Railroad	Dipl.-Ing. Beuerlein
Industrial	Dipl.-Ing. Beuerlein- Rumpf
Greases	Dr.-Ing. Seeles
Aqueous Emulsions	Dipl.-Ing. Beuerlein
Bitumens	Dr.-Ing. Ziegs
Extracts + Polymers	Prof. Dr. Zerbe
Waxes	Prof. Dr. Zerbe
Rust Preventives	Dipl.-Ing. Beuerlein
Cable Oils	Dipl.-Ing. Beuerlein- Dr. Evers
Coolants	Obering. Rössig
Detergents	Dr.-Ing. Seeles
Pest Control	Prof. Dr. Zerbe
Turbine Oils	Dipl.-Ing. Beuerlein- Dr. Evers
Railway Oils	Dipl.-Ing. Beuerlein
Cutting, Drawing, Rolling,)	Dipl.-Ing. Beuerlein
Quenching and Core Oils)	
Ink Oils	Prof. Dr. Zerbe
Textile Oils	Prof. Dr. Zerbe
Leather Oils	Prof. Dr. Zerbe
Refrigeration Oils	Dipl.-Ing. Beuerlein
Insulating Oils	Dipl.-Ing. Beuerlein- Dr. Evers
Research and Development	Prof. Dr. Zerbe
Control Tests	Prof. Dr. Zerbe

The objects of the investigation were :-

- (1) To ascertain the war-time activities of the Rhenania-Ossag A.G.
- (2) To obtain answers to a comprehensive questionnaire based on these activities.
- (3) To obtain a record of research and development activities of the Company.
- (4) To obtain samples of Rhenania-Ossag products, typical of normal production.

3. GENERAL.

Rhenania-Ossag Mineralolwerk A.G. operated five refineries. Three of them - Harburg, Grasbrook and Wilhelmsburg in the Hamburg area and two - Monheim and Reisholz in the Dusseldorf area.

(a) Harburg

This refinery had a throughput of 3,500 tons of crude oil per month which was handled in normal atmospheric stills. The residue was redistilled in high vacuum stills to obtain lubricating oil distillates and asphalt. The volatile fractions from the crude were sent to the Wilhelmsburg refinery for further processing and the lubricating oils were treated partly in Harburg and partly in Grasbrook. The refining of lubricating oil was of normal type and consisted of solvent extraction using Benzol/SO₂, dewaxing and acid treating. The lubricating oil treatments were completed, additives were blended and the finished grades made at Grasbrook. The wax together with similar material from other sources, was cracked and then employed for the production of synthetic lubricating oil by polymerisation with aluminium chloride.

The full range of asphalt grades including brown asphalt was prepared from the vacuum still residue and was packed at Harburg for shipment.

(b) Grasbrook

This refinery received distillates from Harburg and from Astra Roumana and was employed in blending, grease making, acid refining and clay treating and with the recovery of oil from clay. An SO₂ extraction plant for the refining of lubricating oil was also in use.

(c) Wilhelmsburg

The Wilhelmsburg refinery was operated for the distillation of light petroleum fractions and for the preparation of special boiling point spirits.

The feed stocks for this work were obtained from Harburg, Misburg, Reithbrook and from Heide.

The feed stock (4,500 tons per month) was acid treated before distillation and the finished products were distributed for use in oil seed extraction and by the rubber, cleaning, and paint industries.

(d) Monheim

The Monheim refinery (throughput 13,000 tons per month) was engaged chiefly in the manufacture of lubricating oils of low viscosity index and of high melting point bitumens. These were prepared prior to the War from Venezuelan topped crude and lubricating oil base distillate but during the War, the feed stock was Rumanian and Nienhagen topped crudes.

The finished lubricating oil products were light and heavy machine oils, cylinder oils, cable and hydraulic oils. These were refined by treatment with sulphuric acid followed by clay treatment, but the hydraulic oil was first extracted with sulphur dioxide.

(e) Reisholz

This refinery (throughput 3,500 tons per month) like that of the Wilhelmsburg was employed for the manufacture of special boiling point spirits from gasoline and for the storage and blending of motor fuel components.

The feed stock before the war was Venezuelan gasoline but during the war similar material was obtained from Rumania, from the Nerag refinery at Hannover, from the Wintershall refinery at Saltzburgen and from Lobou.

During refining, naphthenic acids (yield 500 kilos per month) were recovered from the spent soda solution from the refining of the distillates. These acids were sent to Grasbrook refinery.

A roller-bearing test machine with a heatable test-head was used for examining greases. A plain bearing test apparatus, with heatable bearings and adjustable load, was used for testing plain bearing greases. Foam testing equipment was used to examine the foaming tendencies of emulsions. The regularity of separation of emulsifiable machine oils was controlled by testing the emulsions at high temperatures in the drying ovens, observations being made of the degree of oil separation.

Corrosion tests were carried out using various procedures, e.g. hanging up the articles under test in the open or in enclosed spaces under control conditions.

Cylinder oils were tested in a film testing apparatus which was lost at the Froital Works. At the same works there was an arrangement for testing turbine oils in which the latter could be examined in turbines heated to different temperatures. This equipment has also been lost.

5. TECHNICAL REPORTS ISSUED BY RHENANIA-OSSAG:*

Below is a list of technical reports covering the refinery and laboratory activities of Rhénania-Ossag. For convenience this list has been divided as follows :-

1. Refinery reports 1939 to 1945.
2. Laboratory reports 1936 to 1940.
3. Laboratory reports 1941 to 1945.
4. Engine Test Laboratory reports 1941 to 1945.

It will be seen from sections 2 and 3 that in general the laboratory investigations concerned the development of (a) Refinery processes (b) Special products and uses thereof and (c) Analytical and testing procedures.

The research work was done under the direction of Professor Zerbe at the laboratories of the Grasbrook and Harburg refineries, but it should be observed that Zerbe's laboratories were separate from those used for routine control of refinery operations. Zerbe's interests appear to have been a long term in character and were not specifically directed towards the furtherance of Germany's war effort. From the titles of laboratory reports it will be seen that one of the chief interests was the use of various types of olefins derived from wax and the cracking of waxy oil and their employment for the manufacture of lubricating oils and other products.

* These Reports can be obtained through the North German Oil Control.

The use of solvents in the separation of types of cracked distillate for subsequent polymerisation was investigated and work was done on methods of disposal of acid sludges and on the provision from oil, of substitutes for such materials as leather, putty, paints, rubber extenders etc. Of particular interest is the work associated with the Harburg synthetic lubricating oil plant and the attempts which were made to elucidate the fundamental nature of Voltol.

In reply to a question as to why Rhonania-Ossag had not participated fully in the German development of petroleum products, it was stated that because this Company was regarded as of "foreign ownership", it was not taken into the confidence of the German Government. Most of this development work was done either at the laboratories of the Ministries concerned or by the I.G. Farbenind. A.G. This left the laboratories of the Rhonania-Ossag free to work on problems allied to their own production.

(1) Refinery Reports.

Yearly Reports

Grasbrook Works:	1939, 1940, 1941
Harburg Works:	1939, 1940, 1941
Wilhelmsburg Works:	1939, 1940, 1941, 1942, 1943.

Monthly Reports

Grasbrook Works:	1939, 1940, 1941, 1942, 1943, 1944.
Harburg Works:	1939, 1940, 1941, 1942, 1943 and up to and including April 1944.
Wilhelmsburg Works:	1939, 1940, 1941, 1942, 1943, 1944 to January 1945.