

Associated Octel Co Ltd. Hayle Works

1939 – 1974

For 35 years Hayle Works on North Quay was a manufacturing unit of the multi-national chemical company Associated Octel Co. Ltd, who manufactured and distributed lead anti-knock compounds to oil refineries world wide.

Bromine was extracted from sea-water for the production of the scavenger which was an essential component of anti – knock compounds. The scavenger, ethylene dibromide, produced by reacting bromine with ethylene, removed unwanted lead oxides from internal combustion engines after combustion.

The basic requirements were sulphuric acid, sourced from Bristol and Plymouth, soda ash and chlorine from ICI factories in Cheshire and ethylene produced from alcohol supplied by Distillers Co. The scavenger was shipped to the sister factory at Northwich in mid-Cheshire which produced the tetraethyl lead octane improver.

Hayle and Northwich were built on behalf of the Ministry of Aircraft Production by British Ethyl Corporation as wartime projects. British Ethyl was a company formed at the behest of H M Government and jointly owned by ICI Alkali and Associated Ethyl Co, each having 50% holdings. Associated Ethyl owned all technical details and know-how, but ICI staffed, built and operated the plant. The *raison d'être* for the whole project was the ultimate availability of 100 Octane gasoline for the Royal Air Force. (The octane number of motor gasoline at that time was 65)

The chosen site was never ideal, and could not be expanded. However, it was secure and had the advantage of a ready supply of warm sea water from the adjacent power Station. Bromine extraction efficiency improved at higher temperature. The main disadvantages were the dilution of sea water by partial recirculation of process effluent and fresh water dilution from the Hayle River, particularly on neap tides. Extended lines of communication and high transport costs were always a problem.

Construction began in Sept 1939 and was speedily completed by July 1940 and under the most challenging conditions. The first scavenger left the plant in August 1940. The process chosen was the Ethyl-Dow “alkali” process, a US development first used in 1934. Cost and time constraints restricted plant and equipment to a minimum which meant that some desirable facilities were only available after 1948.

The wartime plant had a design capacity of 2,500 tons per year but, as with most chemical plant, this was gradually exceeded. Even so, production was still inadequate during the early war years.

It was inevitable that a relatively new company, operating under wartime conditions, should undergo change. ICI had no commercial interest in staying with the project post war and, as a result, on 1st Jan 1945 British Ethyl became wholly owned by Associated Ethyl with ICI agreeing to continue to operate the plant until 1st Jan 1948. Associated Ethyl also purchased the plant from the Air Ministry at the same time.

Attempts were made during 1941-42 to increase capacity, but the Air Ministry refused to sanction further capital expenditure. Significantly, when Associated assumed full control and ownership, improvements were made. During 1948-9 sea water flows were increased by the installation of a booster pump house. A sulphur store was constructed on the Quay to serve the Contact Sulphuric Acid plant that was installed. The quality of the ethylene dibromide scavenger was improved when liquid ethylene, from Petrochemicals, Manchester replaced the in-house production of ethylene from ethyl alcohol.

These refinements and additional facilities made operations more efficient, but plant capacity remained an issue. In 1954 when the Company’s major expansion in Ellesmere Port and Anglesey were completed and commissioned, conversion of the Hayle plant began. In October, after producing 43,400 tons of bromine, the original “alkali” process was closed down to be replaced by the more elegant and efficient “acid” process, also developed by Dow. Over the next 18 months plant and equipment were installed to accommodate the new process and to double the production capacity to 5,000 tons per year.

The “acid” process was licensed from Dow Chemicals and was a later development on the alkali process. Both the acid process and use of liquid ethylene were features of the Anglesey Bromine Plant established in 1953.

In 1961 the Company name was changed to Associated Octel Co Ltd, to avoid confusion in the market place with Ethyl Corporation of the USA

The Anglesey plant, with lower power and transport costs, produced the scavenger at a much lower cost than Hayle. By the early 1960’s its capacity had increased to 15,000 tons per year. In order to improve the economics of Hayle, surplus bromine was sold on the open market. Investment was made in bulk and semi-bulk distribution equipment. Sales improved steadily until in 1968, when scavenger ceased to be produced at Hayle, nearly 4,500 tons of bromine was sold. Markets were in Holland, Switzerland, North West England and West Yorkshire. Some bromine was also sold to China and India

In 1973 the need for significant capital expenditure for the replacement of ageing equipment precipitated the decision to close down and rely solely on the 30,000 ton facility in Anglesey.

The plant was demolished and the site handed back to its owners, Harvey & Co, in mid 1974.