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3

## Well equipped – Future investment at the Oberhausen site

Industrial chemistry is a matter of experience. The driving forces for innovation are process improvements and new applications. In October 2002, Celanese celebrated the 75th anniversary of the Ruhrchemie plant at Oberhausen. With its impressive history, the Ruhrchemie site has proven that it is a leader in developing new technologies and that it can adapt to changes in the market quickly.

### Continuing the glorious past

In its early years, the Ruhrchemie plant established a close network of scientists, engineers and technicians and was able to scale up discoveries in its pilot plants and set up industrial-scale production. Famous examples include the Fischer-Tropsch process for converting coal into liquid hydrocarbons, for which Ruhrchemie obtained a license, and hydroformylation called “oxo synthesis” discovered by Otto Roelen (1897 -1993).

In the beginning, that is, in 1927, the plant was founded to address a big technological-economic challenge: how to use the Ruhr region’s surplus of coking gas, not only as a source of energy, but also as a raw material for the chemical value chain. The vision was to convert coal into chemicals. The Ruhrchemie plant initially focused on the production of ammonia for fertilizer, the manufacture of synthetic fuels, and later oxo synthesis, which was employed to synthesize aldehydes and alcohols, primarily for use in lubricants and detergents.

Oxo synthesis, which has made Oberhausen a technologically leading site for fine and specialty chemicals, is very closely linked to catalysis. Researchers on-site developed breakthrough technologies. Half of the approximately 2,500 patents which the Ruhrchemie plant developed in its 75-year history are in the field of catalysis. Today, catalysts are still chemistry’s most important means of synthesizing new products and making processes more efficient.

In the 1950s, the Ruhrchemie plant created a second business mainstay by starting to manufacture polymers. The technical development of the low-pressure production process for high density polyethylene (HDPE) represents a pioneering success. Large-scale production was possible within a few years. Ultra high-molecular weight polyethylene, GUR®, is still one of those high performance, promising technical polymers used in a wide range of products from electronic components to filters and medical applications, on which Ticona has built a good reputation.



4

1. The syngas plant is being constructed on a tight schedule. It should start operating in mid-2003 and supply the plant with a mixture of carbon monoxide and hydrogen.



5

2./3. The Ruhrchemie plant wrote technology history from the Fischer-Tropsch plant (2; synthetic fuels and lubricants) to oxo synthesis (3; oxo distillation columns today).

4. Claudio Sonder (right) and Dr. Alex Kaufman, CEO Kaufman Holdings/Hatco, break ground for the new joint neopolyol ester plant at the Oberhausen site on October 28, 2002.

5. The Oberhausen site is also a popular training center for around 60 apprentices in all occupations related to the chemicals business.

6. The 3-D picture of the new neopolyol ester plant shows the dimensions of the modern outdoor installation and supply tanks.

### Expanding technology leadership

We set a new technological milestone in polymer production at Oberhausen in 2000 by building the world's first plant for large-scale production of cycloolefin copolymers (COC), marketed under the brand name Topas®. The highly transparent polymer Topas® has excellent properties and is utilized in a wide range of high-tech applications from quality packaging of pharmaceuticals to optics and medical devices. This innovative material is one of our investments in the future.

### New growth markets for Specialties

Celanese has excellent know-how in chemical intermediates at Oberhausen. We are No. 1 in carboxylic acids and we also offer a range of specialties which allow us to participate in lucrative growth markets such as aroma chemicals. A further growth product is TCD Alcohol DM, a very special polyol. Celanese is a leading producer of TCD alcohol, which is sold to a variety of markets. Various types of this material are used to produce special polymers for paints as well as to coat and harden plastic lenses and optical fibers. Coating compact discs and very special adhesive layers for DVDs are two particularly fast-growing application areas. A capacity expansion of the plant is planned for 2003.

### Ground-breaking for a neopolyol ester plant

In October 2002, executives from Celanese and Hatco Corporation broke ground for a joint venture neopolyol ester plant (NPE) in Oberhausen. Hatco, of Fords, New Jersey, is a leading manufacturer of synthetic lubricants – basestocks for refrigeration systems, car engines, jet turbines and other demanding applications. NPE will be produced in an integrated complex. Celanese already produces the most important basic materials for NPEs, namely carboxylic acids and polyols. The joint venture will primarily supply the European market from Oberhausen.

The joint venture, called Estech, will enable Celanese to continue its forward integration into the chemical value chain. The combination of Hatco's competence combined with local cost-effective production of raw materials forms the ideal basis for positioning the joint venture as a European market leader. The NPE plant will initially have a capacity of 7,000 metric tons per year: it will be capable of producing a large variety of basic esters and blends. Production is scheduled to start in fall 2003.



6

### Inauguration of a new syngas plant

Synthesis gas comprising carbon monoxide and hydrogen constitutes the raw material basis for oxo products and specialties at the Oberhausen site. The existing SAR syngas plant, which is still used to produce syngas from heavy oil, is no longer considered economical, mainly due to the high maintenance and operating costs. Construction of the new Oberhausen-SAO syngas plant started in April 2002 following the ground breaking for the plant in October. The syngas plant is scheduled to start operating by mid-2003. The new plant uses natural gas, is also more environmentally friendly, and is expected to operate much more reliable than its predecessor.

At a time when industrial chemicals companies need to secure a cost advantage and be in a position to produce growth-oriented products, the new synthetic gas plant is the ideal building block to enhance the attractiveness of the Oberhausen site. The high qualification standards of around 1,200 employees from Celanese Chemicals and Ticona are also one of Oberhausen's strengths. In addition, Oberhausen currently serves as a training center for approximately 60 apprentices. Oberhausen is adapting to our growth strategy of expanding sites in those regions in which we want to participate in sustainable growth. ◀

## CELANESE AT THE OBERHAUSEN SITE

**Area:** approx. 120 hectares (approx. 25 hectares available)

**Companies:** Celanese Chemicals incl. Estech, Ticona

**Products:** wide range of organic chemical intermediates (amines, carboxylic acid, plasticizers, NPE etc.), basic chemicals (butyraldehyde, 2-ethylhexanol, butanol etc.) as well as polymers (GUR®, COC)

**Sales volume:** approx. € 360 million

**Employees (Chemicals, Ticona):** approx. 1,200

**Apprentices:** approx. 60

**Certification:** ISO 9001, ISO 14001 and others

**Other companies:** Clariant, Messer, Syntetix