Made in China

Bayer MaterialScience constructed its largest production site in Shanghai in just a few years. Bayer Technology Services was instrumental in planning all of its facilities. 2011 will mark the next major milestone in the development of this location.

Bayer is investing €2.1 billion in the expansion of its site in Shanghai. While the world’s largest plant for the production of the polyurethane raw material MDI (350,000 tpa) and the facility for the production of the polycarbonate Makrolon® (200,000 tpa) are now operating, the TDI plant (250,000 tpa) will be commissioned in 2011.
Through his work Alfred Soppe has made a decisive contribution to the construction of the Bayer site in Shanghai. Below: A view of the HDI and MDI plants.
What Success Creates

particularly those colleagues with families have been. “It seems that with this group the willingness to move was almost greater than with bachelors,” Hansen recalls.

Alfred Soppe confirms that Shanghai offers optimal conditions, especially for families with young children. “In terms of childcare and international schools, the choices here are excellent.” The same is true for the cultural program. This is no small wonder considering that Shanghai is the venue for the World Expo in 2010.

These conditions do not only attract employees from Germany. Bayer colleagues from all over the world are making their way to ambitious China. At one point he had assembled employees from seven countries in his team alone, mainly from South American and other Asian countries, says Soppe.

His team consists of the people who are constructing the unit in which hydrochloric acid will one day be recycled. Hydrochloric acid is a by-product in the production of TDI, the abbreviation for toluene diisocyanate, which is an essential precursor for the production of polyurethane flexible foam used in, for example, mattresses or upholstered furniture. The subgroup Bayer MaterialScience is constructing a world-scale TDI production plant with an annual capacity of 250,000 metric tons at its site in the Shanghai Chemical Industry Park (SCIP).

The TDI plant will be a major milestone in the expansion of the Bayer Integrated Site Shanghai at the SCIP, located at the Southwestern periphery of the metropolis. Ten years ago this area was still a greenfield site, where one was more likely to see shrimp fishermen throwing their nets into the sea. Within just a short time, a production site has emerged that is among the largest in the Bayer Group. Since 2003 Bayer MaterialScience has built and is now operating various plants for the production of raw materials for coatings and world-scale facilities for the production of polycarbonates and for the polyurethane raw material MDI. All of them supply high-quality materials to customers in China and other areas of the AsiaPacific region.

Bayer Technology Services has played a major role in all these projects. Indeed, plant engineering is of such importance to the local subsidiary that Bayer Technology Services even added it to the name of its Chinese company, which is known as Bayer Technology and Engineering (Shanghai). In the early days, this subsidiary employed some 50 colleagues, but in the meantime, this figure has increased to around 800. Some 400 alone are involved in the TDI plant, which will produce TDI in several reaction steps from a precursor.

Bayer Integrated Site Shanghai: The TDI plant is a major milestone in the expansion of the facility in the southwest of the Chinese metropolis.

REPRESENTING THE INTERESTS OF THE OWNER

Interviewed Dr. Ralf Sick-Sonntag, Head of Engineering, regarding the role of Bayer Technology Services in owner’s engineering.

Is the TDI train a particularly successful example of owner’s engineering in practice?
Sick-Sonntag: Yes, in every respect.
How would you describe your role in owner’s engineering?
Sick-Sonntag: It can be compared to an architect who closely represents the interests of the building’s owner. But our responsibilities go even further: we discuss and check the business case with the owner, consider all alternative solutions and supervise construction from the initial planning to the plant start-up.
What if the customer is only interested in an average turnkey factory at as low a price as possible?
Sick-Sonntag: Here too we can help by first discussing with customers whether their idea for a solution is the right one for their particular requirements. If that is the case, we can support them in realizing the project successfully for the designated purpose.
In which sectors are you involved?
Sick-Sonntag: Our main areas of expertise lie with the chemical and pharmaceutical industries. It is important to keep in mind that this includes the relevant infrastructure provision, waste management and utility installations.
What are the strengths of Bayer Technology Services?
Sick-Sonntag: Clearly, our employees. I am not exaggerating when I say they are international experts with the highest level of competence.
That Alfred Soppe was suggested to be Project Manager for the hydrochloric acid recycling unit is no accident. The engineer has had over 15 years of experience with various plants involved in chlorine chemistry. And hydrochloric acid recycling also focuses on chlorine, whereby the chlorine is recovered from the hydrogen chloride (HCl) present in hydrochloric acid and then recycled back into production. Despite his years of experience in this field, Soppe has entered unknown territory with the new plant in Shanghai. “It is the first Bayer plant in which the chlorine is not extracted by electrolysis, but is instead chemically recovered through oxidation,” he explains. It will also be the world’s largest plant of its kind with an annual capacity of 120,000 metric tons of chlorine. No wonder it is such an exciting assignment for Soppe and his team!

The official groundbreaking ceremony for the entire TDI plant took place in October 2008. In May 2009 the work began on the facility for HCl recycling. The first visible highlight came in mid-September, when cranes pulled four reaction columns into their positions for the eventual production of the TDI intermediate TDA. The longest of these columns extends 30 meters into the sky. Together with experts from Bayer Technology Services and Bayer MaterialScience, some 2,000 craftsmen from external contractors are currently at work at the the TDI plant construction site, which is comparable in size to about 12 football fields.

After the MDI facility, the TDI plant will be the second largest production unit of Bayer MaterialScience at the SCIP. This is also reflected in the amount of material processed for this site. Some 35,000 metric tons of concrete and 20,000 metric tons of steel were provided, and most of it has already been used in the construction. The equivalent of 150 kilometers of conduit piping has also been necessary.

Experts with extensive experience like Alfred Soppe are impressed by the speed of completion and the quality and safety standards of Bayer’s projects in Shanghai. “Safety is a top priority here,” says the 57-year-old. The accident statistics are well below the average in an international comparison. The more than 10,000 hours of various safety training courses for all employees involved have no doubt contributed to this high standard.

Bärbel and Alfred Soppe have never regretted their decision to go to China. They have now lived in the bustling city for more than two years, and it will certainly be another year before they can leave, since the commissioning of the TDI plant is currently scheduled for mid-2011.

Soppe believes that the move has actually enhanced their family life. Each of the three children has since visited their parents once, and the first grandchild has even made the trip. In fact, Alfred Soppe is convinced that his children have now seen their parents in a completely different light. Spending several weeks with them in Shanghai is clearly something else than a short visit to their small home town near Krefeld. “I would even venture to say the children are now somewhat proud of their parents,” the German engineer is pleased to report.