

# Borsig Membrane Technology

## persuades customers faster

**Borsig Membrane Technology is not only an internationally successful company offering its customers innovative membrane technology solutions but also it is a leading edge EPC with high-quality planning methods based on the CADISON® software writes BERNHARD D. VALNION (Editor in Chief, Economic Engineering)**

The scenario is always much the same: An owner-operator needs to handle or wants to reuse a purge gas produced in his plant – say a chemical plant or a refinery – for the purpose of emission control, product recovery or conditioning. This inert gas contains organic constituents like propylene or ethylene monomers. For such cases, the owner-operator may well call in the expertise of Borsig Membrane Technology (BMT). The company, a member of the Berlin-headquartered Borsig Group with its 600-strong workforce, has been developing intelligent membrane-based separation processes for over 20 years. BMT's outstanding technology is used in a range of applications in the chemical, petrochemical, and oil/gas industries for the treatment of hydrocarbon-containing liquid or gaseous mixtures. Particularly noteworthy are the successful implementation of the gas permeation process for selective separation of organic vapours from exhaust gas, and especially the treatment of vapours released during the distribution of highly volatile hydrocarbons.

The parent company Borsig embraces the following five business units:

- Process Heat Exchanger
- ZM Compression
- Membrane Technology (BMT)
- Boiler Systems
- Service.

As a result of several acquisitions, BMT became part of the Borsig Group, one of the oldest manufacturers in Germany, back in the year 2000. In the 19th century Borsig was the largest loco-

motive manufacturer in Europe. In 2012, the company celebrates its 175th anniversary. Borsig's order intake ranges between 250 and 300 mill. euros. One core product with which the company can claim world market leadership is the quench cooler used for back cooling ethylene.

### Seeking the optimum

As Jürgen Stegger, Managing Director at BMT GmbH, explained in discussion with our editors, the company does have a basic membrane-based process that could be de-scribed as "standard". But extensive customization is required depending on every single project. In the course of a year, twenty to forty projects with run-between three and fifteen months are realized. A typical plant with a total investment up to 10 mill. euros has a footprint of about 10 x 12 m<sup>2</sup>.

BMT offers a comprehensive solution pack-age starting at the FEED phase, including construction, maintenance and overhaul. Already in consultation with the customer, the sales team presents a realistic tailor-made solution. At the two sites, Rheinfelden in Southwest Germany and Gladbeck in the Northern Germany, all disciplines are available: project man-

agement, process, mechanical, electrical, and instrumentation engineering.

In the FEED phase Aspen Hysys is used for process simulation. But as Mr Stegger assured, they don't just use this simulator straight out of the box: "A lot of customization work was done to map our know-how, e.g. concerning membrane technology, into the simulation tool. Hysys can be used to model all unit operations like compression, adsorption, and distillation. Various case studies are tested to determine the optimal process for the customer." Mr Stegger mentions the customers' specified target values that have to be reached during this process. Based on these results, the dimensions and corresponding parameters of all devices like compressors, vessels, or distillation columns are defined in the process engineering flow scheme (PEFS).

### Planning with CADISON®

"A lot of information like the media to be transported or pipe classes to be

used has to be added to the PEFS to generate the P&IDs. All these data have to be managed consistently," Mr Stegger stresses. Since the P&IDs are the basis of the agreement with the customer, data consistency is extremely important. The CADISON® 3D planning tool from ITandFactory GmbH headquartered in Bad Soden near Frankfurt/Germany concentrates the engineering workflow at BMT into one system and thus significantly accelerates the planning processes. The common object-oriented data model for the different fields of application (e.g. tender planning, process engineering, installation planning, pipeline planning, electrical engineering, and instrumentation) enables the integration of all planning phases. CADISON® uses AutoCAD as a 2D/3D geometry engine. The data exchange between Hysys and CADISON® is realized with "MS Excel" as the interface. "When the P&ID is generated, the database is filled and all the people involved in the project are able to query it with filters for special information. Over the whole project run-time, all project data coincide with that depicted in the P&IDs," says the General Manager, emphasizing CADISON®'s data integrity.

Of course, the initial effort required for entering default

data into the (project) data-base has to be considered. Moreover, 3D data of reused components have to be generated and copied into the database. "But once this work has been done, a potential source of errors is eliminated because one-to-one data mapping is processed during the whole project life-cycle." explains Mr Stegger, underlining the huge benefit.

The productivity enhancements resulting from the new planning infrastructure are not so important for BMT, Mr Stegger says, but: "If there are two more or less identical projects to execute then the time reduction is obvious because it is only a matter of copying the database and matching it to the actual situation". However, this is not often the case. As mentioned earlier, the increased quality of the planning process is far more important: "For example, the possibility of exporting well-defined revision states from the CADISON® database – so to speak a data freeze at special milestones – makes document exchange with all the contractors involved absolutely traceable."

Experts often propound the view that a vital data exchange between ERP and the plant design system helps to ensure cost transparency in project execution. However, at BMT there is no explicit data exchange between the installed SAP system and CADISON®, meaning CADISON® objects are not referenced to SAP data sets. But there are no reasons to miss this, the senior engineer says. An example helps to explain this: In each project let's say ten or twenty pressure vessels are placed and listed as corresponding objects in the CADISON® database. But when it comes to procurement, because of discount rates across all ongoing projects, these vessels are ordered. The same is true for valves or other purchased components: "We may even buy a larger volume of those parts to keep them on stock for future projects," Mr Stegger explains.

With the introduction of CADISON®, 3D CAD was rolled out at the Gladbeck and Rheinfelden sites. Mr Stegger recalls: "It took some time to train our designers until they were really confident in using 3D CAD because previously we had only planned in 2D. After taking this hurdle, the acceleration in our planning process was obvious: faster navigation through the design, drawings and sectional views being generated at once by mouse click." Also the possibility of clash detection is a big plus for Mr Stegger.

For marketing and sales reasons, the 3D models are prepared with Autodesk Navisworks. "For customer presentations I have always 3D renderings of former CADISON® projects with me. Although there is nothing special about a 3D model, the surprise in customer's eyes when he sees his plant in a rendered 3D model for the first time is always worth seeing." With these visualization techniques, the project time is reduced because Mr Stegger's sales team is able to persuade the customer faster. Quite simply, because BMT's competence is better articulated.

### Summary and outlook

A lot of effort was put into getting an overview of the market for plant design tools. "We did this with our modest company size in mind," Mr Stegger explained. In response to our question why ITandFactory had come out the winner of the selection process, the Managing Director explained: "From the very beginning, from the initial consultation up to the sales phase and afterwards, we have been very satisfied with our contacts at ITandFactory. And the hotline service is excellent as well." The quick response time of the CADISON® database supports our decision in favour of ITandFactory.

BMT is taking an additional document management system into consideration. At the moment, it is not possible to link all documents e.g. e-mails or word files to the corresponding project database. "Importing all



this information into the CADISON® database would mean losing too much performance," Mr Stegger said and that would be a pity.

