

# Optimised process performance

Plant Engineering & Process Engineering



# ‘When things get complicated, DMT makes things easy.’

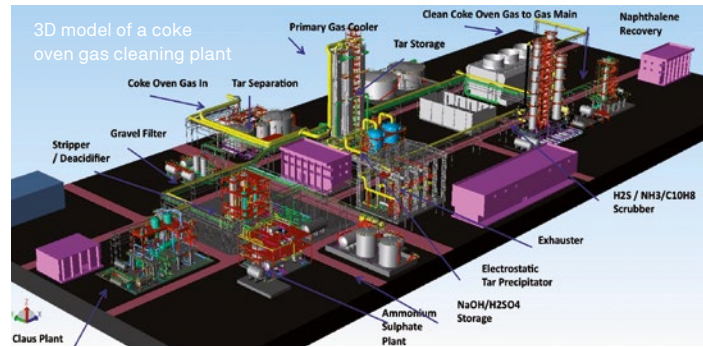
Our understanding of consultancy



Process industry plant

**When the phone rings in Essen, North Rhine Westphalia, Germany, and it's a US steel industry company calling to ask us to check a concept recommended by the US Environmental Protection Agency, this is nothing out of the ordinary for us. But it does tell you a lot about DMT's reputation around the world when it comes to plant and process engineering.**

When you learn that it didn't take DMT long to identify a serious flaw in the Americans' concept which made its implementation impossible and that we soon developed a solution which was not only environmentally friendly, but which above all saved the steelworks from incurring million-dollar contractual penalties a year, this tells you everything you need to know about our engineers' all-round process expertise.



## Nothing is more valuable to the process industry than efficient processes.

This is precisely what DMT specialises in when it comes to plant engineering. DMT handles everything from the initial feasibility studies and analyses to the construction and handover of turnkey plants.

We serve as a general contractor for plant engineering around the world. We assume full responsibility for projects in the areas of mining, the steel industry, and the chemical and petrochemical industries. With regard to process engineering, our engineers focus on the raw materials processing of ores, coal and minerals, and on the reuse of the residues from processing, the cleaning of coke oven gas, and chemical, petrochemical and pharmaceutical production processes.

The methods, procedures and quality standards applied are optimised in order to achieve maximum efficiency coupled with process reliability. DMT offers all-inclusive consultancy and tailored engineering solutions with a broad array of services to help you achieve your goals.

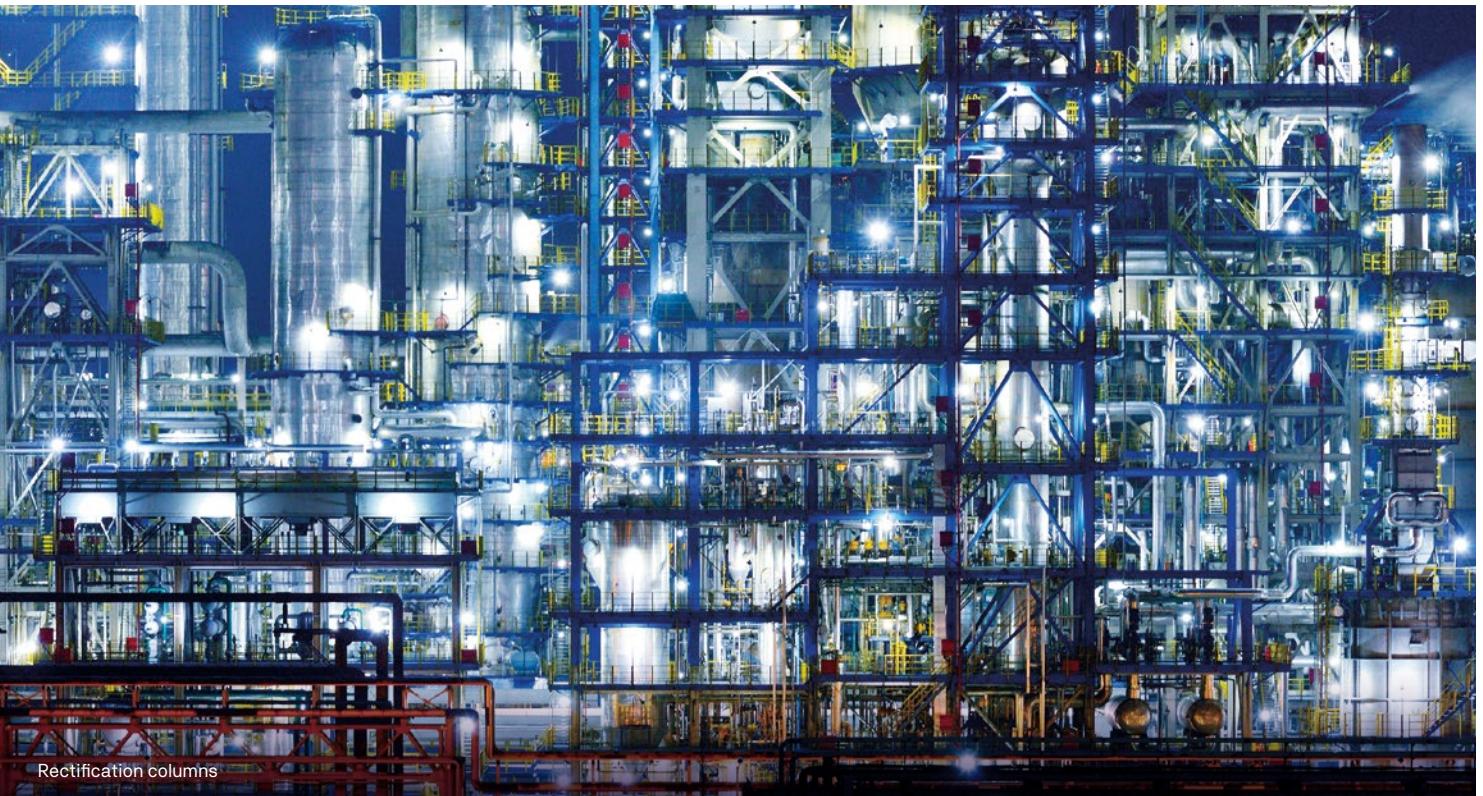
Be it for modifications, expansions or new developments, our advice and service portfolio is so comprehensive that we are able to identify and supply the best solution without fail.

Excellence and innovation in everything we do are what we are committed to achieving as a globally active company. We seek to establish long-term, productive partnerships founded on mutual trust. We act responsibly, sustainably and ethically – without exception and to the benefit of our customers. In short, what you can expect from us is exceptional engineering performance. We guarantee sustainable project success based on our reliably efficient planning and stringent work standards. You can therefore expect:

- Committed and intelligent consulting
- Comprehensive engineering
- High quality standards coupled with the appropriate certification
- Further specialist expertise such as condition monitoring and predictive maintenance

As a global group of 14 engineering and consulting firms based in 30 locations around the world, we should be in a position to find a way for you, too, to guarantee process reliability simply.

# ‘From designing a plant to its start-up, you can build on our experience.’



Rectification columns

**Our services are founded on the unparalleled experience we have been garnering since 1737 (no, that is not a printing error!) and our intelligent interconnection of project-related planning, realisation and operation skills.**

We have matured together with the mining and steel industries, as they have with us too. We are familiar with every obstacle within the process industry, all instances of plant optimisation potential and every process engineering opportunity that has ever worked in the past. Consequently, we also know exactly when our own services have exhausted their potential and when those of cooperative partners are more advantageous for our clients.

For example, we collaborate frequently, readily and closely with our sister company ENCOS. ENCOS GmbH & Co. KG specialises in engineering services for the chemical, petrochemical and pharma industries and, together with DMT, forms an exciting entity that offers tailored top performance in design and project planning as well as turnkey solutions.

We enjoy success in the area of plant engineering not least because we have PAUL WURTH ITALIA S.p.A. at our side as a highly experienced and reliable cooperative partner in this field which is unparalleled in its understanding of its trade. Together, we assist many industry clients throughout their plants' life cycles or offer them tailored solutions for challenging issues in specific areas.

Rather than simply telling you which partner we will be teaming up with when and why, we prefer to reach an agreement on these matters with you in advance. After all, the best partner for us is first and foremost you as our client.

There are therefore substantial reasons for our making the recommendation here that you build on our experience. Mechanical and plant engineering for the process industry calls for a fundamental insight into the relevant process correlations and interdependencies. State-of-the-art plants can only be created on the basis of sound planning and construction.

DMT leaves a lasting positive impression in this technically demanding segment of plant engineering thanks to active and globally recognised support in everything from consultancy, auditing, evaluation and assessment to the planning and construction of plants, as well as their redevelopment and repair during ongoing operations. The requirements made of a plant in terms of both safety on the one hand and efficiency and eco-friendliness on the other are reconciled with one another by effectively integrating all the different areas of expertise. We therefore help our clients comply with environmental standards and help them obtain a high level of “value added” from their processes.

### **An overview of our plant engineering services:**

- Redevelopment concepts and studies
- Process engineering
- Project management
- Basic and detailed engineering
- Delivery of plants or core components
- Installation and start-up procedures
- Training of operating staff



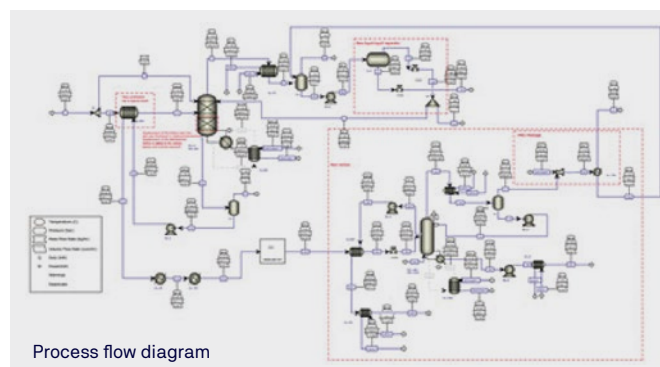
Process control station

In the area of process engineering, we focus on the cleaning of coke oven gas in the by-product recovery systems of coking plants. DMT’s technical know-how is likewise used for the cleaning of other process gases, for example in natural gas treatment, in refineries, for carbide production or in the areas of chemicals and speciality chemicals.

We assist our clients with the planning, construction and start-up of facilities for the energy-related use of coke oven gas and redamp. The gases are combusted in gas engines or turbines to generate electricity and process heat highly efficiently.

### **The key processes here are as follows:**

- Tar separation
- Gas cooling
- Gas cleaning for the removal of ammonia, hydrogen sulphide (desulphurisation), hydrogen cyanide, BTX, naphthalene from process gas
- Extraction of by-products such as sulphur from Claus plants, sulphuric acid, ammonium sulphate, ammonia, BTX, naphthalene, tar
- Waste water treatment



Process flow diagram

‘With 360°  
self-perception,  
we achieve all-round  
tailored solution quality.’

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We speak the same language as the operators and players within the process industry, be they in India, Russia, France, the USA or any of the other countries in which our work makes an impression. With the exception of the Antarctic, we operate on all the continents around the world with the same self-perception. At all times, we focus on the big picture and on smooth and optimised procedures, from raw material treatment and gas supplies to the ultimate product in the industry in question.

**In everything we do, quality, safety and the protection of health and the environment are our company's primary goals.**

We are committed to achieving greatness in this area. We maintain our standards with the ongoing training and professional development of our staff. It is very important for us that our QM system is certified in accordance with DIN EN ISO 9001 and our HSE system to have SCC\*\* certification, thereby offering you a guarantee of optimum performance.

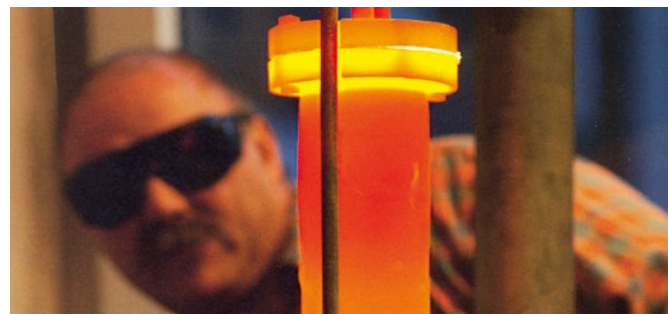
There are very few tasks that we are not already familiar with. You can therefore rest assured that there will be no nasty surprises or unforeseen errors at any stage in the processing chain.

We also plan and deliver laboratories for the testing of coal, coke and gas in order to boost product quality assurance. These laboratories allow testing and analyses in accordance with globally accepted standards. Our plant engineering portfolio is well rounded as it includes the planning and delivery of test benches for testing and assuring the quality of drive units.

We even go so far as to run a coking plant ourselves for test purposes. Our head of ce in Germany has been receiving orders for this plant to assess and assure product quality from all over the world for decades. Some may say this is excessive, but we stand by our DMT technical centre.

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**And after around 300 years in the market, we believe it's the little things that make a difference.**



Technical testing of coal and coke in the laboratory



DMT's semi-industrial testing coke oven

These include better vocational training, greater precision, binding commitments and a greater understanding of the product. This may not be immediately visible or even quantifiable, but it can ultimately be identified on the basis of the fruits of our 360° focus on absolute quality in everything we do.

# ‘Your plant reliability is in our process DNA.’

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Opening a bypass

## **For us, quality is non-negotiable.**

The DMT Group guarantees compliance with all the laws, regulations, guidelines, standards and contractual obligations of relevance to you as well as with any voluntary commitments you make. These include the requirements of the TÜV NORD GROUP, of which we are a part. You can therefore rest assured that you are always on the safe side.

Improving the quality of our services and protecting the environment are part of our day-to-day activities. Our success is dependent on the ongoing improvement of our performance, the controlling of hazards and the active involvement of all the staff in achieving a zero-error culture.



In our efforts to achieve these ambitious goals, we have introduced systems that boost quality, recognise hazards, assess risks and identify suitable measures to prevent them. An ongoing programme of auditing and revisions put into effect by our operational management team guarantees the effectiveness of this system, which can be considered a benchmark within our industry.

To achieve optimum planning reliability and therefore also security of investment in all of your projects, be they green field or brown field, you should place your trust in German engineering in all your projects. In the sensitive brown field area, we can, upon request, start up a plant for you with no malfunctions and then hand it over to you in optimum condition. DMT's experts around the world are distinguished in this area as we are already very familiar with most plants. Our wealth of expertise is amplified by a wide array of processes, serving as your key to solid success.

We are unparalleled in terms of technology too, and you experience these benefits at the latest when you develop modern condition monitoring with us. This all but eliminates unexpected plant downtimes due to technical problems.

Which units actually need to be monitored? And which are process-relevant? Based on the right implementation, the inspection and auditing intervals can be flexibly aligned with the requirements, unnecessary repairs can be avoided and a plant's life cycle can be maximised. Planning investments in new machinery is made easier, while the risk of total breakdowns is minimised.

This system technology is based on your practical needs. Our modular systems are highly versatile. If, in spite of our high standards, a special application-specific method is required, we will develop a suitable technical solution and will adapt the hardware and software to the environment in question, including for use in harsh environments and explosion-risk areas. We see to the basic engineering, supply all the equipment and oversee the start-up procedure.

Our strategy is founded on identifying mechanical condition trends. Components are monitored in terms of time, operations and data with the help of sensors. Our systems then use the information gathered to formulate trend analyses and forecasts.

Those responsible are presented with the relevant condition figures in an easy-to-understand way. This makes downtimes foreseeable and means machinery parts need only be replaced once their wear margin has been exhausted.

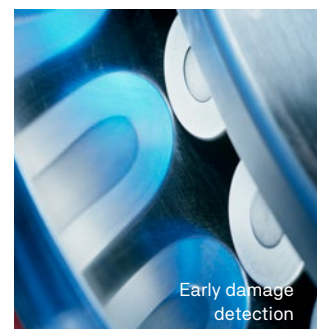
## DMT condition monitoring

### Services

- Configuration and planning of measuring systems (project planning, measuring strategy, parametrisation)
- Technical implementation (hardware, configuration, start-up procedure)
- Maintenance and servicing training

### Benefits

- Identification and avoidance of damage
- Reduction in downtimes/production losses
- Improved plant availability
- Optimised maintenance costs
- Increased occupational and industrial safety
- Automated condition evidence
- Warranty evidence



**‘From the financing plan to analysis of the operator’s obligations, a methodological approach is taken to safety.’**

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Consultations with clients

**We draw on our expertise and technological lead to reduce the complexity of plant and process engineering right from the very first client consultation.**

We also offer an unparalleled depth and breadth of service thanks to our network of partners within the industry and in research and teaching. What’s more, we guarantee the reliability of our analyses and the optimum execution of all the work for which we are responsible.

By working with the DMT Group, you can enjoy an unusually high prospect of success based on risk minimisation and planning reliability for your plants and processes. This is something that leading global enterprises such as ArcelorMittal and Sasol have known for years, opting to adopt a safe, methodological approach with DMT time and again. When security of investment and financial optimisation have to be guaranteed, our comprehensive portfolio of services has everything covered (see box).

# Interdisciplinary expertise – DMT's strength.

## DMT's services at a glance:

### Concept Design

- Feed Studies
- Status analyses
- Process analyses with system and vulnerability identification
- Concept studies
- Process simulation
- Feasibility-Studies
- Pre-engineering with process selection
- Local agency liaison
- Safety analyses
- HAZID, HAZOP, SIL

### Basic and detailed engineering

- Project management
- Process design
- Component engineering and specification
- 3D layout planning/visualisation
- Pipe, steel and concrete construction planning
- Electrical, instrumentation and control engineering planning and automation
- Strength analysis/FEM parts, pipes

### EPC installation and commissioning

- Project management
- Overall and individual technical disciplines
- Plant erection
- Equipment and plant delivery
- Construction supervision

### Construction management

- Operating documentation
- Start-up
- Performance testing
- Overseeing

### Operation and maintenance

- Fire and explosion protection
- Safety and disruptive incident concepts
- Smart inspection and monitoring
- Operator obligation management
- Risk assessments
- Life cycle calculations
- Condition monitoring

### Optimisation

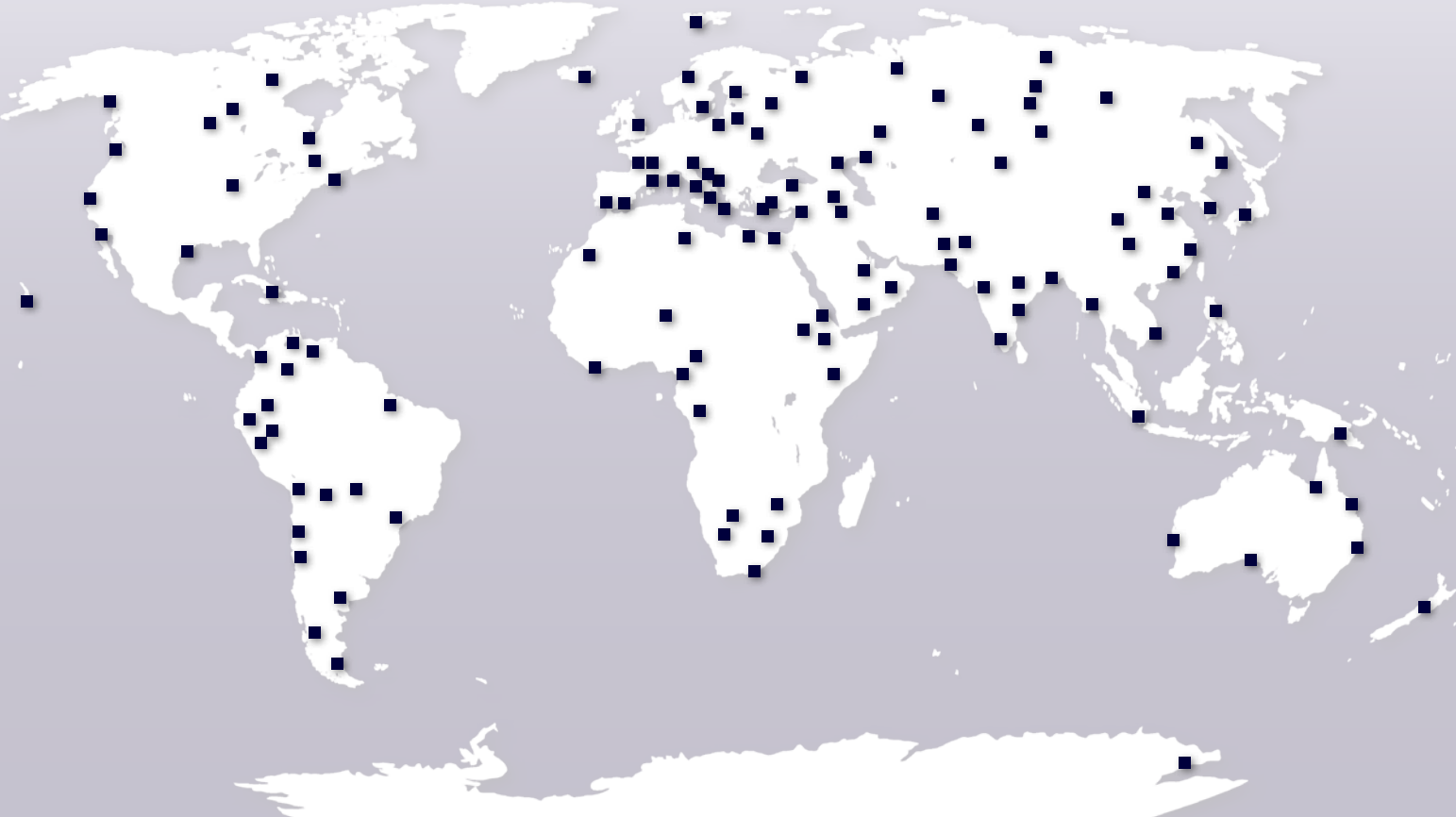
- Consulting
- Process simulation
- Troubleshooting
- Energy audits
- Energy efficiency and optimisation
- Introduction of energy management systems (EMS)

### Modernisation

- Consulting
- Process simulation
- Capacity expansion
- Debottlenecking



Guests being shown around the coking plant technical centre



# DMT's project locations around the world.

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