Efficiency in turnkey solutions

Technology, mechanical engineering, automation, electrical engineering and turnkey capability from a single source – your competitive edge powered by our unique knowledge and experience

Metals Technologies
The global metal industry continues to grow. According to current forecasts, demand for steel is set to grow by an additional 25% by the year 2015. Ensuring the long-term competitiveness of a metallurgical plant operator in these market conditions requires extensive expertise in construction of new plants and modification of existing ones.

You expect ...

- To be able to succeed in a global market with expert turnkey solutions from a single source
- Expertise in plant building thanks to experience from throughout the world
- Efficient project management and implementation of turnkey projects combined with unique expertise in engineering and construction management
- Minimum costs and time for the project thanks to coordination of each stage of work
- Increased environmental protection and optimized processes for efficient production with well-designed solutions
Your challenge:
To succeed in a global market with smart investments

**Seamless process management**
Market conditions in the metallurgical industry require you to operate at maximum efficiency and flexibility. To be able to keep up with global requirements, you need to coordinate all processes when you invest in a plant. This ranges from planning to implementation. And whether you’re working on a greenfield or brownfield project, the planning phase is the foundation for the successful implementation of the plant. That’s why you need the right partner with many years of experience and expertise in building turnkey plants. Process cycles must be coordinated according to your specific conditions so that they’re perfectly engineered, and the development of a competitive plant is ensured.

**Efficiency**
Carrying out a project in the shortest possible time and rapidly starting up a plant are challenging. You need an experienced partner to ensure the profitability of your plant throughout the entire life-cycle.

**Reliability**
You have to make large investments when developing a metallurgical business. Reliability and trust are important when accepting the investment risk of a new or modified plant. That’s why it’s so important to approach a construction project with a partner who will ensure the necessary planning reliability and optimum project management. It’s the only way to improve the success of your investment.

**Global expertise**
To keep pace with global competition, you need a partner with international experience – one who provides the necessary expertise for all structural measures. You also need a partner who can draw on a wealth of international experience to provide you with unique, valuable knowledge right from the start. This includes knowledge of both legal regulations that vary by region as well as local conditions for planning and integration of culture-specific requirements.
Our solution: Change your perspective with a reliable partner

Experience that matters
Siemens VAI is your reliable partner for greenfield and brownfield projects. We have over 40 years of worldwide experience in the development and implementation of turnkey projects for the metallurgical industry. Close collaboration with all technological departments of Siemens VAI ensures that plants can be developed and implemented exactly in line with individual requirements. Thus, optimization of interfaces is ensured in the process. Siemens VAI offers plant operators the experience and expertise to succeed right from the start, as impressively proven in over 1,800 successful projects in more than 100 countries around the world.

Sustainable solutions for the entire plant
In our turnkey projects, Siemens VAI focuses on creating sustainable economical and ecological solutions. Our range of products and services includes process technology, mechanical and electrical equipment, automation, as well as infrastructure and auxiliary plants, project management and commissioning – all from a single source. Siemens VAI’s broad wealth of experience makes it possible to offer solutions for the entire value-added chain, so that individual solutions can be optimally coordinated.

Minimum cost and project risk through turnkey solutions expertise
These goals are achieved by the turnkey solutions competence center of Siemens VAI, which offers customer-oriented support for the following areas: construction, steel structures, building technologies, fire protection, cranes and transport systems, corrosion protection and insulation, wastewater treatment and utilities, installation planning as well as complete construction site management.

Turnkey solutions from Siemens VAI are highly efficient thanks to perfect coordination of the production process, which is incorporated early in the planning phase. To round off our single-source offer, turnkey solutions from Siemens VAI manage the various legal conditions in individual countries as well as cooperation agreements. These agreements are with international engineering, construction and erection companies. Siemens VAI’s expertise in turnkey solutions forms a solid foundation for future success.

Intelligent solutions to optimize your investment costs
With their minimal time and cost risk, our complete solutions from a single source fully meet your economic requirements as the plant operator.
Success must be built on a solid foundation that meets the needs of modern metals production. That’s why we from Siemens VAI have made it our first priority to ensure the competitiveness of plants with our turnkey solutions for over 40 years. We achieve these goals with best possible engineering and project management, and with industry specific, global state-of-the-art expert knowledge. As in the past, we will continue to focus on customers’ specific requirements when optimizing investment costs.

**Good reasons for Siemens VAI’s turnkey solution expertise:**

- **Seamless process management** – backed with sustainable and innovative technology. Our process know-how leads to a design that thoroughly reflects the specific requirements of your production plant, while maximizing energy efficiency and minimizing financial costs.

- **International experience** – proven by metallurgical solutions implemented in more than 1800 projects worldwide. Our top health and safety standards are key priority in international business.

- **Optimized efficiency** – when it comes to project implementation and plant start-up. Our focus is on the profitability of your plant and optimally managed interfaces throughout the entire life-cycle.

- **Providing support** – a reliable partner helps when it comes to large investments in the metallurgical business. Our optimum project management ensures best planning and implementation reliability that leads to your successful investment at minimum time and cost risk.
Our products and services:

- Turnkey capabilities ............................................ 8
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Worldwide experience and unique expertise combined in turnkey solutions from Siemens VAI
On top in the metallurgical industry with turnkey solutions from Siemens VAI

Full-line expertise: Our experience and expertise in all aspects of the production chain in metallurgical production industries make Siemens VAI your perfect partner worldwide for turnkey solutions. For over 40 years, global market leaders in a wide range of metallurgical industry segments have relied on reliability and efficiency. They have relied on turnkey solutions from Siemens VAI.

Single-source solutions for the entire metallurgical process route – successfully implemented in more than 1,800 projects worldwide.
Numerous requirements must be fulfilled when building or modernizing a plant. These include guaranteed completion within the agreed time and cost framework, reliable start-up, and rapid attainment of the planned production volumes and product qualities. Siemens VAI takes on complete responsibility for project implementation and start-up, and can also provide tailored financing solutions. That leaves you free to concentrate on your core business of manufacturing your products and marketing them profitably.
Turnkey solutions from Siemens VAI – Success from a single source

Instead of a coordination effort...
Normally when a project is assigned there are a large number of suppliers to coordinate with respect to timing, technology, logistics and financing. This complexity is a major factor that extends through the life-cycle of the plant and raises a number of questions: Who is responsible if the design capacity is not achieved at the planned time at budget costs? Who ensures that the system can be expanded in all its technical complexity?

Siemens VAI – your life-cycle partner: Our project finance structuring expertise
Projects for mining, iron and steelmaking, and rolling and processing are complex and require proven project management to implement them efficiently.

As an integral part of Siemens VAI and part of the Siemens Financial Services worldwide network, our international financing department provides you with tailor-made financing solutions based on in-depth industry, country-specific and financial knowledge.
Siemens VAI has extensive experience and knowledge in developing and implementing financing structures for metals projects worldwide. We support our clients in designing and arranging short, medium and long-term financing structures, usually in conjunction with international financial institutions and commercial banks. This is just another part of our complete solution.

Project management from the market leader
Siemens VAI offers you our experience from over 1,800 successfully completed projects around the world. Our project management under PM@Siemens is certified to ISO 9001:2000. We have standardized tools available to handle all levels of project management with a transparent and organized approach.
Right from the preliminary project phase, the project is divided into various construction phases. Measures are defined and a detailed cost calculation is carried out for each of these phases. Siemens VAI’s comprehensive planning and coordination capabilities are the key to our turnkey expertise.

Core expertise of Siemens VAI:
- Monitoring costs and progress of the project
- Providing basic and detailed engineering
- Preparing specifications for equipment and building works
- Scheduling and site management
- Ensuring technical quality and accuracy
The result is optimal coordination between all interfaces.
Siemens VAI provides a wide range of turnkey execution models to meet your specific needs, and always with the goal of optimizing your investment costs.

**Intelligent solutions to optimize your investment costs**

There are two factors involved here:

- **Integrated technical turnkey solutions**
  Turnkey solutions that are optimally integrated with metallurgical technology provide a solid foundation for optimized investment costs.

- **Optimized turnkey execution models**
  Siemens VAI offers you a tailored turnkey execution model for risk management, manpower and project control.

When combined, these two factors help keep investment costs to a minimum.

No matter which solution fits your needs, Siemens VAI is your experienced and reliable partner. We focus on innovation and state-of-the-art solutions to optimize your investment costs.

**Main benefits:**

- Few technical interfaces since all components are well integrated in the overall concept
- Overall quality is guaranteed by partnership with qualified subcontractors
- Well-planned project management ensures on-schedule completion and smooth start-ups for short payback periods
Choose between various turnkey execution models:

**Full turnkey model**
With the full turnkey model you work together with Siemens VAI as your main contractor. The supply and turnkey work is in the hands of an expert and reliable partner. The partnership can either be executed as a consortium, cost-plus fee or lump-sum agreement.

**Features:**
- Full financing available
- Low commercial risk
- Customer’s manpower can be limited

**Turnkey service model**
The turnkey service model offers you the most balanced form of risk management, price and added value. Siemens VAI provides all services for turnkey solutions at a fixed price. Purchase of turnkey items is under your control. In this case, each partner contributes its core expertise. You have no hassles with the installation of your plant, because Siemens VAI supplies the technological solutions and all necessary services. Our technical evaluation helps you select the ideal turnkey sub-contractor.

Your savings contribute to your optimized investment costs, while you benefit from excellence in design solutions and project management services from Siemens VAI.

**Features:**
- Optimized investment costs
- Full utilization of core expertise
- No hassles with the installation of your plant
- Support in selecting turnkey subcontractors
- Potential savings of risk provisions

**Process turnkey model**
The process turnkey model gives you the opportunity to choose the turnkey contractor. Siemens VAI will support you as main contractor for part of the process. The turnkey part lies in your hands, and you can freely utilize your in-house competence and resources.

**Features:**
- Free choice of turnkey suppliers
- Management of turnkey part lies in your hands
- Full utilization of in-house resources
Civil works
Count on in-depth knowledge

Backed by our international experience, civil works professionally covers the areas of building construction and concrete construction. Offered services include design, construction engineering as well as construction management.

Siemens VAI turnkey solutions accompany all construction work in the area of metallurgical plants, from the start of the project planning phase to acceptance by the customer.

Siemens VAI’s expertise in constructing plants in various geographical regions ensures that the plant designs are adapted to the local climatic conditions.

In the area of reinforced concrete construction, our services range from pile foundations to architectural building construction solutions. Siemens VAI is also accustomed to working in large dimensions. We have the competence to handle construction sites with over 100,000 cubic meters of reinforced concrete cubature to the complete satisfaction of our customers.

Scope of services:
- Project management of engineering companies and construction companies
- Design of buildings
- Functional and static design of civil works
- Formwork and reinforcement drawings
- Preparation of tender documents and evaluation of bids
- Quantity survey for invoicing purposes
- Execution of civil works for foundations and buildings
- Supervision of construction on site
- Design studies for economic solutions

Phase 1 & 2 – brownfield

Continuous casting line
Main benefits:
- All construction services are perfectly adapted to the industrial plant
- Various regional requirements for the plant are considered right from the planning phase
- Coordination of interfaces between construction and installation work is secured
- Permanent monitoring by experienced experts from Siemens VAI is provided from the beginning of the planning phase up to the finished project

Phase 3 – brownfield

Converter foundation – emergency pit
Steel structure
A solid basis for all production requirements

**Scope of services:**
- Project management of engineering companies and fabrication shops
- Structural design engineering incl. static and dynamic calculations
- Shop drawings
- Preparation of tender documents and evaluation of bids
- Quantity survey for invoicing purposes
- Fabrication of steel structure
- Supervision of fabrication
- Design studies for economic solutions

Bay steel structure, rolling mill

Rolling mill
Siemens VAI develops and builds customized steel structure solutions adapted to the specific requirements of metallurgical production plants. Our experience from well over 100 completed plants ensures that your projects will be perfectly executed.

**Steel structure solutions**

Siemens VAI handles all types of industrial buildings, their platforms and bins, as well as the associated surrounding facilities.

In particular, tower-like steel structures (blast furnace, COREX®, FINEX®, MIDREX®) for iron production are subject to very individual requirements, which we meet by working in close cooperation with technology planners.

We handle steel structure weights of up to 50,000 t per project, industrial towers with heights over 100 m and weights of up to 10,000 t.

**Main benefits:**

- Optimized solutions tailored to your needs thanks to our extensive experience in construction
- A design adapted to local conditions as well as to project-specific requirements
- Efficient project execution ensured by our worldwide procurement together with stringent monitoring
- Coordination of interfaces between equipment and steel structure
- Expert supervision from the start of the project up to the completion of the plant
Scope of services:
- Establishing main data of cranes, such as:
  - capacity,
  - main dimensions and crane outlines,
  - hook approaches,
  - operating speeds,
  - classification,
  - estimation of wheel loads,
  - electrical and control systems
- Coordination of all engineering fields
- Preparation of tender documents and evaluation of bids
- Supervision of detail engineering, manufacturing, erection and commissioning
- Project control and scheduling
Mobile components such as cranes play a crucial role in the efficiency of modern metallurgical production.

The right equipment

Based on the needs of your production chain, Siemens VAI provides the suitable cranes and mobile equipment.

We provide a wide range of cranes with capacities from 1 to 550 t such as charging cranes, teeming cranes, slab/billet handling cranes, scrap handling cranes, rolling mill EOT cranes, coil/bundle handling cranes and maintenance cranes. Cranes are provided with special lifting attachments for safe load pickup and transport such as spreader beams with laminated hooks, magnets, mechanical or hydraulic slab tongs, and coil tongs.

Siemens VAI is a specialist for road transport vehicles such as scrap bucket carriers, slag pot carriers, slab carriers and coil transporters – all specially designed for the metallurgical industry. A variety of special elevators rounds off our offer for perfectly organized mobility.

Main benefits:

- Interfaces between production equipment and cranes are handled by experienced experts
- The resulting crane solutions are thus ideally tailored to the needs of metallurgical production
- Continuous supervision ensures that all requirements are met
- Our experts accompany you from startup to commissioning and training
Building services
Optimum and fire-proof working environment

Scope of services:
- Heating, ventilation and air conditioning systems
- Sanitary installations
- Fire detection and alarm systems
- Stationary fire extinguishing systems (water, gas, foam or special extinguishing agents)
- Fire extinguishing water network
- Smoke and heat removal systems
- Concepts for escape and rescue routing
- Safety concepts and fire load calculations
Climatic conditions determine the working atmosphere inside the plant. Siemens VAI building services lay the foundation for optimum productivity of the plant, and create the basis for an optimized working environment. Furthermore, our specialists place great importance on the protection of human life and the safeguarding of equipment.

**Heating, ventilation, air conditioning**

Building services are adapted to the specific conditions and future applications right from the early stage of plant design. We provide heating systems with heating capacities of up to 2 MW; air conditioning systems with air flows of up to 200,000 m³/h; chiller systems with cooling capacities of up to 2 MW.

**Fire protection**

We ensure that safety concepts are adapted to specific conditions in industrial plants. Customized fire alarm, extinguishing or smoke ventilation systems ensure that fires are detected and extinguished at the earliest possible point in time. Our fire detection and alarm networks operate with up to 10,000 addresses.

**Main benefits:**

- Tailored systems are provided for a wide range of metallurgical plants with regard to regional and plant-specific requirements
- From basic design to commissioning, all building service systems are from a single source
- Local and global sourcing of components is at your disposal
Water management, utilities & piping

Unique expertise in water

Scope of services:
- Utilities and storage systems
- Water supply and treatment plants
- Scale water and muddy water treatment plants
- Project planning, feasibility studies and project management
- Monitoring activities for installation as well as commissioning and plant operation
- Engineering and project management for piping systems
In the modern metallurgical industry, efficient water management is not only a means to an end, but a guarantee for economic and ecological process flows. Perfect integration into the entire system is vital to ensure competitiveness in the future. The implementation is always adapted to local legal requirements, environmental protection conditions and customer standards.

Modern water management is mainly affected by three factors: quality of the make-up water, climatic conditions and legal requirements. These are partially determined by varying regional conditions. Thanks to our many years of experience in the various regions of the world and our comprehensive process knowledge in plant construction, we’re able to professionally incorporate these localized, varying factors into the plant design. Only perfectly optimized plants can provide a platform for successful project management, and ultimately lead to the best possible result for our customers.

**Main benefits:**
- All systems are optimally integrated into the production plants
- Single-source responsibility is ensured for the entire metallurgical process
- Compliance with all environment-relevant requirements is guaranteed
- A total solution provider as well as a supplier of individual products and components meets all of your requirements
Erection engineering and site management

Specific execution and support on site

For erection engineering, site management and site monitoring, our professional handling of the site ensures the quality of the plant and guarantees adherence to both the budget and the schedule.

In addition, our experts have experience in dealing and working together with people from different cultural groups. With their social sensitivity, motivation and leadership ability, they ensure a perfectly functioning site.

Execution of erection

Erection is executed by sub-contractors who are selected based on best choice. This includes erection of steel structure, mechanical equipment, piping and electrical equipment.

On-site health and safety

Our staff is well trained with regard to health and safety issues. Compliance with international, local, customer and company regulations is mandatory, and is assessed on a regular basis.

Scope of services:

Erection engineering & site management

- Cost estimation for site management and execution of erection
- Preparation of time schedules for greenfield and brownfield projects
- Preparation of site organization, site regulations and safety rules
- Preparation of tender documents for the execution of erection
- Final accounting of subcontractors
- Change management

- Enforcing safety rules and site regulations
- Follow-up of progress and budget
- Assuring quality requirements
- Providing facilities & accommodation
- Regular coordination with customer

Supervision of erection:

- Checking the completeness of supplies together with the erection contractors
- Instructions for storage, erection, surveying and testing
- Securing the timely, proper and professional execution of erection
Main benefits:

- Experienced engineers, site managers and supervisors with a well-founded and wide range of state-of-the-art experience, as well as cultural awareness are available.

- Selection of erection contractors is optimized in accordance with the scope of work, local conditions and their experience.

- Single point coordination of the entire site activities including time scheduling for an optimized erection time, and budget planning, ensures the lowest possible costs and best possible quality.
A reliable and perfectly functioning sequence of processes is based on individualized solutions. Ultra-modern technologies from Siemens VAI not only lay the foundation for optimized productivity, but also guarantee the highest possible level of process safety and ecology. Maximum environmental protection and the use of next generation technologies ensure successful production.

Strict safety standards ensure optimum conditions for future workflows. Geographical conditions play just as big a role as legal requirements. But safety aspects – such as fire protection – are important not only during construction itself, but also in the work place.

Main benefits:
- The highest possible level of process safety is guaranteed
- Next generation technologies are our leverage to protect our environment
- The safeguarding of equipment and the protection of human life are our key priorities
Life-cycle management

Partnership never ends

Siemens VAI life-cycle Services

As a plant operator, you have conflicting needs. On the one hand, your performance is measured each quarter against short-term profitability expectations. On the other hand, you have to think on a totally different time scale compared with the capital market. Depending on the lifetime of your plant, you have to take 15 years or more into account. At the very least, that’s 60 full quarters.

But thanks to our comprehensive expertise and integrated approach to solutions, you benefit both short-term and long-term from our life-cycle services.

In the short term: Backed by our extensive experience with many reference plants, we provide you with the certainty of fast, dependable production start-up and shorter amortization periods.

In the long term: Our master plan guarantees competitive performance for your plant in every phase of its life-cycle. Whether we’re providing 24/7 technical support, optimizing maintenance, or making permanent plant improvements, we’re always working to ensure the cost-effective operation of your plant.
Expertise from experience
Selected success stories with turnkey solution know-how

Customer: Hadeed, Saudi Arabia
Type of plant: MIDREX® – direct reduction, steel plant, continuous casting plant
Our solution: Full turnkey project, capacity increase through the expansion of the production plant
Start-up: 2007
Technical data: DRI, 150 t EAF, LF, slab caster, rolling mill extensions

Customer: Nishnij Tagil, Russia
Type of plant: Meltshop modernization
Our solution: Brownfield turnkey revamp of 4 LD converters
Start-up: 2007-2008 during full production and extremely reduced standstill times for each converter
Technical data: 4 x 160 t converter

Customer: Mittal Steel, Poland
Type of plant: Hot-strip mill
Our solution: Brownfield turnkey project with an extremely short project duration
Start-up: 2007
Technical data: 2.4 mio t/y

Customer: ArcelorMittal Tubarão, Brazil
Type of plant: Blast furnace plant
Our solution: Full turnkey greenfield
Start-up: July 2007
Technical data: 2.8 mtpy, productivity 2.5 t/m3 (working volume)
Customer: Carinox (Arcelor Mittal Group), Belgium  
Type of plant: Stainless steel meltshop and slab caster  
Our solution: Greenfield, Turnkey  
Start-up: 2005  
Technical data: 180 t EAF, LF and AOD converter, slab caster

Customer: voestalpine Stahl Linz, Austria  
Type of plant: Continuous galvanizing line  
Our solution: Turnkey project management  
Start-up: 2003  
Technical data: 320,000 t/y

Customer: Cosipa, Cubatao, Brazil  
Type of plant: BOF converter, continuous casting plant  
Our solution: Full turnkey project  
Start-up: 2002  
Technical data: BOF converter 160 t, slab caster

Customer: voestalpine Stahl Donawitz, Austria  
Type of plant: Meltshop modernization, hot rolling mill, caster  
Our solution: Brownfield revamp of the existing steel plant (2 LD converters) and modernization of CC, HRM and dedusting – full turnkey project  
Start-up: 2000  
Technical data: 2 x 67 t converters, 5-strand caster
Completely Integrated Solutions with Siemens VAI

Integrated offerings for higher plant performance

Optimized processes
We lay the foundation for optimized processes with proven, leading products worldwide, including mechanical and technological engineering for metal production, rolling and strip processing as well as process control engineering, drive engineering and power supply. Integrated online and offline process models reflect decades of practical experience and help to ensure reliable, reproducible quality.

Our process engineering expertise fuses these products into complete plant solutions that also accommodate the upstream and downstream processes. These solutions are the basis for optimal resource use, minimized waiting times and reduced maintenance and spare parts costs, as well as wide flexibility with respect to raw materials and the resulting products.

Efficient production control
A further factor for competitive production is the quality of information processing. Production data must be consolidated and compared with planning data to ensure optimal production flow.

As a leading supplier for the metals industry Siemens VAI offers integrated information technology across all automation levels – from the sensor to the Enterprise Resource Planning system. Patented solutions, such as for smelting reduction plants, electric arc furnaces, hot strip mills, profile rolling or processing lines, enable systematic quality assurance, efficient logistics, flexible production planning and scheduling, end-to-end tracking and tracing from raw materials to the end product and back, and much more.

Maximized life-cycle returns
Services from Siemens VAI help to ensure high profitability for your plant throughout the entire life-cycle. Reliable project implementation by our specialists sets the course for quick start-up and repayment of funds as scheduled.

During the operating phase, preventive maintenance, standardized components and component design that meets the requirements of steel plants help keep maintenance costs low. A reliable spare parts supply – with in-house workshops for key components – ensures high availability. And modernization at the right time guarantees a high level of competitiveness and compliance with environmental regulations in the future.
Perfect integration of every aspect

Completely Integrated Solutions offer a comprehensive range of products and services, tailored and refined to the specific requirements of your plant. The key to this approach is the close interlinking of plant construction, process engineering, electrical and automation engineering, sensors and actuators, as well as information technology and life-cycle services, seamlessly integrated by Siemens VAI.

Completely Integrated Solutions from Siemens VAI – your benefits from an integrated concept:
- High process quality, lower energy costs and increased throughput – by taking all process steps into account
- Reproducible high product quality and efficient use of charging materials – thanks to integrated process models
- High enterprise quality, low life-cycle costs and unique investment protection – through flexible production based on metal-specific MES systems, intelligent plant design and integrated planning.
The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.