VST BUILDING TECHNOLOGIES AG

The Future of Construction

VST GROUP

Dear Sir or Madam

VST BUILDING TECHNOLOGIES AG is the future of construction. Our company stands for innovation, competence and quality. With our patented technology, the automated production line in our own factory – one of the largest plant of its kind in Europe – as well as the wider value added chain, we are a leading provider of technology solutions for the construction industry.

With more than 10 years of experience in the development and use of prefabricated formwork elements for building construction we are here for you – investor or building owner – a strong and reliable construction partner at your side.

We offer customized solutions from a „single mold“. Our service range from project planning and structural engineering to the production of composite formwork system elements, as well as their assembly and concreting at the construction site. We license the use of our patented technology and provide a comprehensive technology transfer to the delivery of complete plant facilities. Due to the passive house certification, we also meet the latest requirements for energy efficiency.

We are pleased to introduce our company, the technology and our portfolio in detail within this brochure.

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Advantages of VST technology at a glance

- Industrialization of construction processes utilizing a high degree of prefabrication
- All supporting elements of a building are produced in the factory
- Automated VST production line with high efficiency and more than doubled production capacity
- Short construction time – saving up to 50 percent
- Significant reduction in the total cost of a building
- ´Just in time´- delivery of the VST components on the construction site
- Wide scope of design options – enabling custom products for building owners
- Superior economic and ecological advantages compared to conventional construction
- Passive house components that are compliant with the latest energy efficiency requirements

Characteristics of the VST components at a glance

- Combination of the advantages of reinforced concrete and timber construction method
- Components are individually prefabricated in the factory
- Components are made of cement-based particle boards and offer ducts, breakthroughs etc.
- No additional precautions necessary for formwork on site
- Superior structural characteristics
- Near constant surface temperature of the walls and slabs
- Low energy loss, pleasant room climate and excellent humidity compensation
- Very good sound insulation and earthquake resistance
- Total mold protection resulting from the high pH value

VST BUILDING TECHNOLOGIES AG

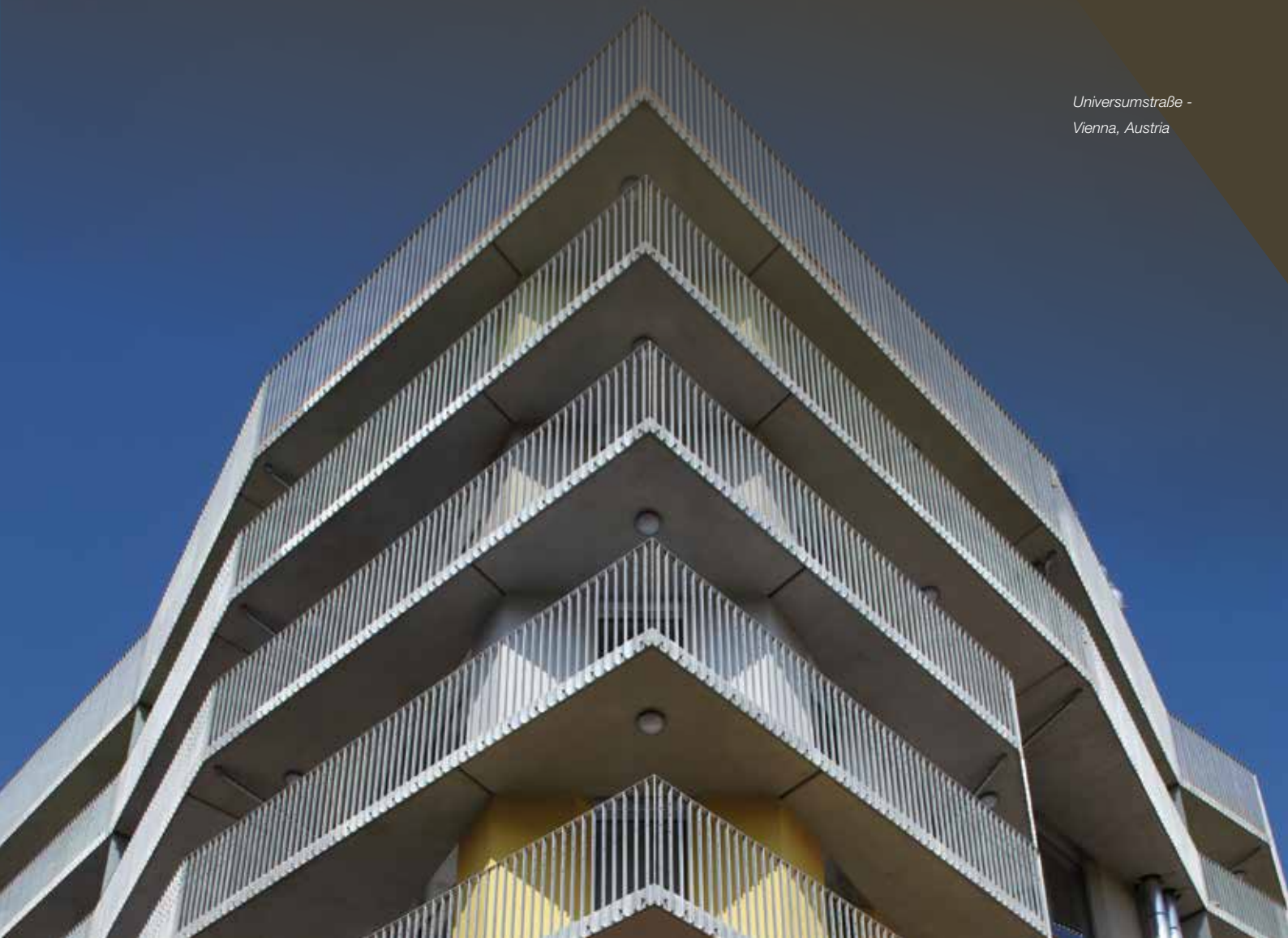
Innovative technology, years of experience and expertise

Fröjdeni Sällheten - Stockholm, Sweden

Torkhuset - Stockholm, Sweden

VST BUILDING TECHNOLOGIES AG is a leading provider of technology solutions for construction with the highest expertise in composite formwork system. With innovative patented technology VST offers custom-made solutions for building owners.

VST covers a complete value chain – starting with project planning compliant to the passive house standard. The core area of the business consists of the production and delivery of VST components such as slabs and walls – the supporting elements of a building – as well as the related planning and installation services. The core markets of VST are Sweden and Germany. In Sweden VST is represented by their subsidiary VST Nordic, responsible for the distribution and mostly also for the assembly of the VST-elements in this region. In the German-speaking countries VST offers all works up to a VST raw superstructure and engineering services for building constructions as well. VST also licenses our patented technology, offers “technology transfer” training for the use of VST technology, and provides complete VST plant facilities including fully-operational installations for the customer. VST has already supplied production facilities for customers in Russia and Belarus.



Universumstraße - Vienna, Austria

Fröjdeni Sällheten - Stockholm, Sweden

Aulan 2 - Stockholm, Sweden

VST has industrialized the building processes completely. All VST components are prefabricated in the factory and then transported to the site, where the final assembly takes place. A crucial milestone – a revolution in the advancement of technology – VST achieved with the successful automation of the production line in its own factory in Nitra, Slovakia. As a result, the efficiency and capacity of component production has increased even further. The maximum output has expanded from 180,000 to 430,000 square meters of wall in total per year.

VST BUILDING TECHNOLOGIES AG works as a specialist in modern, affordable and ecological construction together with well-established, financially strong partners. Overall, VST has successfully implemented more than 160 projects. For example: the largest hotel in Stockholm, Clarion Hotel Sign; Hotel Belvedere Timmendorfer Strand in Germany; and the first multi-storey passive house in Sweden. In addition to hotels and residential complexes, VST technology has been used to build commercial real estates, sports and leisure facilities, as well as social and health care facilities.

Clarion Hotel Sign - Stockholm, Sweden

VST-Akademie - Zell am See

VST was founded in 2002 and the headquarters are located in Leopoldsorf near Vienna, Austria. The engineering and the planning for production and statics are carried out through its subsidiary VPG Verbundsysteme Planungs-Produktions-Baugesellschaft mbH (VPG) in Zell am See, Austria. The highly qualified engineers at the VPG technical office perform all essential planning services to successfully implement the project. In addition to the development of construction projects according to customer requirements, VPG are also able to manage and advise throughout the planning and construction process. The VST elements are produced by the subsidiary VST Verbundschalungstechnik s.r.o. in Nitra, Slovakia, whereas a Swedish construction company holds a share of 25%.

In the context of technology transfer, engineering training for customers is available at the VST Academy in Zell am See, Austria. Training concerning plant production; production processes; control and operation of VST plant facilities for loading, shipping, and transportation management are carried out directly in the VST factory in Nitra. Training for the installation of VST elements, concreting, and interfacing with other trades are offered directly on current construction sites operated by VST BUILDING TECHNOLOGIES AG.

VST BUILDING TECHNOLOGIES AG is also involved in joint venture companies in Sweden (VST Nordic AB), the Netherlands (VST Benelux BV), and Belarus (Sumesnae tavarystva z abmezhavanai adkaznatyu CSP BZS).

The VST BUILDING TECHNOLOGIES AG is a solidly financed company with a strong equity base. The VST BUILDING TECHNOLOGIES AG has a long-term core shareholder: The Saint Leopold Private Foundation is the majority owner of the company.

VST-Technology

Innovative and custom-made building solutions

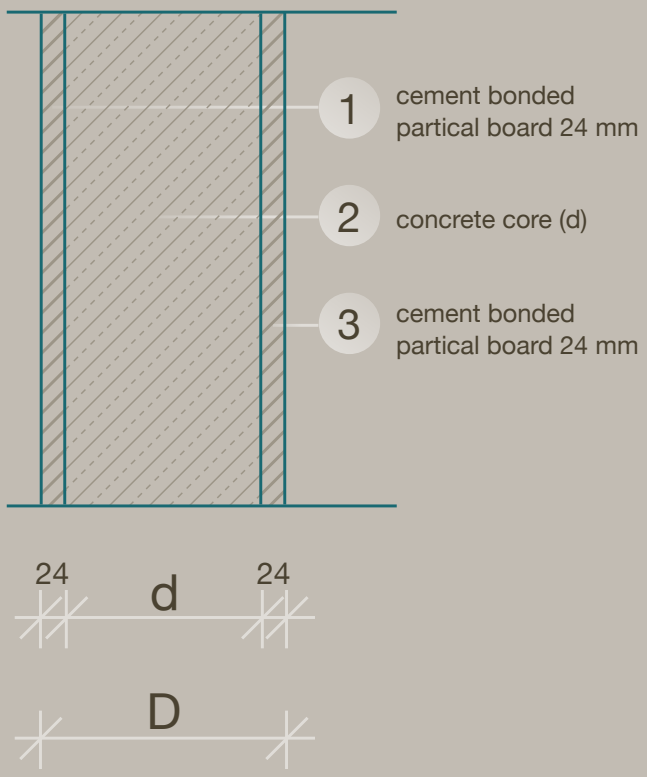
The composite formwork system developed and patented by the VST BUILDING TECHNOLOGIES AG is a reinforced concrete massive construction; the formwork consists of 24 mm thick cement-bonded particle boards. These elements are industrially prefabricated at the VST production plant in Nitra, Slovakia. The product can be modified to meet individual customer requirements and then transported to the construction site. Throughout the industrial prefabrication process the highest precision is guaranteed. At the construction site the work is limited to the assembly and concreting of the elements. The low weight of VST elements means that the transport and assembly costs are kept to a minimum.

The VST composite formwork system combines the advantages of both reinforced concrete and timber construction. Giving our product the following qualities: (a) resilience to high pressure; (b) high earthquake resistance; (c) very good sound insulation and heat storage; and (d) total mold-protection resulting from the high pH value. The near-constant surface temperature of the cement-bonded particle boards ensures a pleasant room climate and excellent humidity compensation.

VST components form the composite shell, which remains as a so-called “lost formwork” in the construction. This achieves its final stability by concreting with flowing concrete or self-compacting concrete (SCC). VST BUILDING TECHNOLOGIES AG has developed and patented special steel profiles which are bolted from the inside and thus serve to shape the elements and maintain the formwork pressure. The in-house locksmith manufactures all the built-in and connecting parts for the reinforcement of the VST elements.

The patented composite formwork system of VST BUILDING TECHNOLOGIES AG is suitable for all load bearing and non-load-bearing constructions. Depending on requirements, design elements such as walls (vertical or inclined), slabs (horizontal or inclined), columns, beams, formworks, stairs and special items can be manufactured. If it is necessary, the required reinforcement will be also statically installed in the factory.

VST walls



The VST walls are made of 24 mm thick cement-bonded particle boards. Steel spacers developed by VST are used to connect components. The wall elements are connected with galvanized countersunk bolts, without penetrating the surface of the elements from the inside. In the VST factory all elements are manufactured with an 8 cm wide and 1-2 mm deep groove or 12 mm wide and 6 mm deep milling-joint.

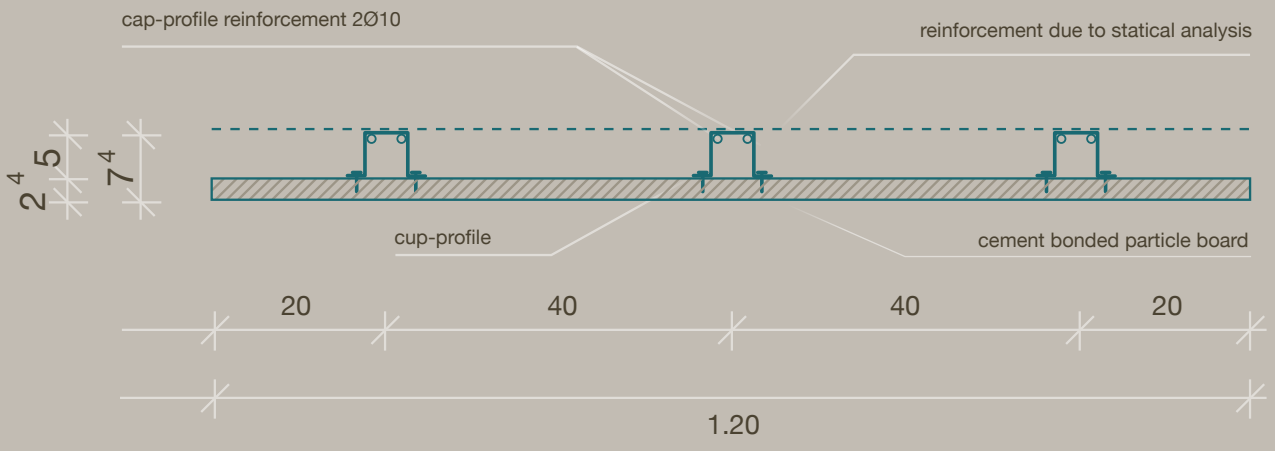
The following wall types can be produced:

D = 17.5 cm (Thickness of concrete corn D = 12.7 cm)
D = 20.0 cm (Thickness of concrete corn D = 15.2 cm)
D = 21.5 cm (Thickness of concrete corn D = 16.7 cm)
D = 23.0 cm (Thickness of concrete corn D = 18.2 cm)
D = 25.0 cm (Thickness of concrete corn D = 20.2 cm)
D = 30.0 cm (Thickness of concrete corn D = 25.2 cm)

The respective total thickness of a wall element arises from the strength of the concrete core plus 24 mm for cement-bonded particle boards on both sides.

It can be produced by variation of the punch tool to any desired wall thickness. All types of breakthroughs and openings, as well as the installation of electrical ducts are possible. The maximum weight of a VST wall amounts to about 70 kg per square meter without reinforcement and built-in parts.

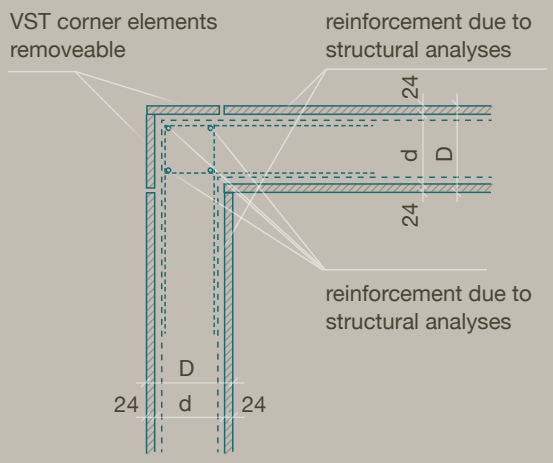
VST slabs

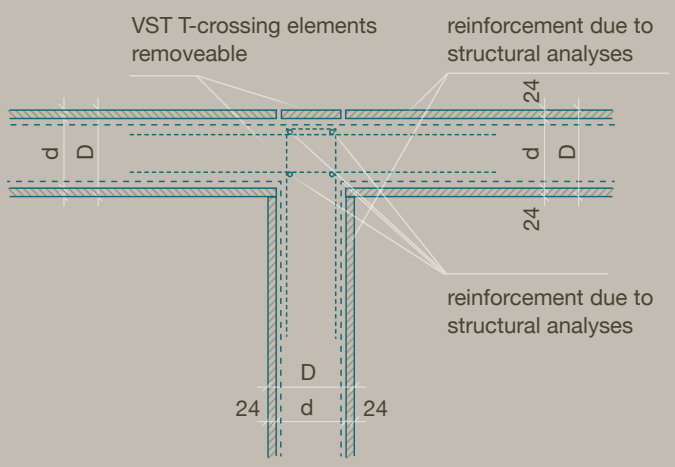


The VST slab contains a hat profile, which is screwed on the 24 mm thick cement-bonded particle boards developed and manufactured by VST (Type HT, height of top hat profile uniform 50 mm) at the factory. This also serves as a supporting element during the lifting operations and prior to concreting. The hat profile elements are manufactured in a width of 2.40 m and a maximum of 6.00 m border.

The hat profiles are made of steel plates and steel bars. These are screwed at a center distance of 40.0 cm with galvanized countersunk screws from the top of the cement-bonded particle boards. The hat profiles have a height of 50 mm. The total thickness of the slab element is 75 mm regardless of the concrete slab thicknesses. Without reinforcement the maximum weight is around 38 kg per square meter. The steel bars of the slab elements can be counted as tensile reinforcement (9.93 cm ² / m).

VST special elements





In addition to the wall and slab elements produced by the VST BUILDING TECHNOLOGIES:

Beams and columns:
- Rectangular or square
- Reinforced at the production plant
- Usable with all other VST composite formwork elements
- Shear heads for high resistance against punching

Stairs:
- Straight flights
- Landings similar to VST slabs
- Simple assembly
- Reinforced (except link between flight and landing) at the factory
- Sound insulation solutions are available (Tronsoles etc.)
- Early use possible during the construction phase (no ladders etc. required)

Special elements:
- Shear head elements
- Window bays (different shapes)
- Breakthroughs, openings, built-in parts (rails etc.)
- Passive fan-openings

Passive house certification

Universumstraße - Vienna, Austria

VST BUILDING TECHNOLOGIES AG has a passive house certification and meets the latest requirements for energy efficiency. All new residential buildings in Europe have to meet the passive house construction according to the EU directive from the year 2020. VST already offers building owners the appropriate components for construction work. The VST composite formwork system is certified annually by the Passive House Institute (PHI), an independent research institute under the direction of Prof. Dr. Wolfgang Feist.

Bla Jungfrun -
Stockholm, Sweden

Automated production line in Nitra

The next generation of production technology

In 2013, VST BUILDING TECHNOLOGIES AG made significant progress in the advancement of technology: The company developed and put into practice a new process that enables the automated production of VST components. This procedure was registered as a patent worldwide.

The first automated production line of VST BUIDLING TECHNOLOGIES AG was opened in Nitra, Slovakia in the autumn of 2013. This is the most modern and the largest plant – with an area of almost 17,000 square meters – for the production of building elements such as walls and slabs in Europe.

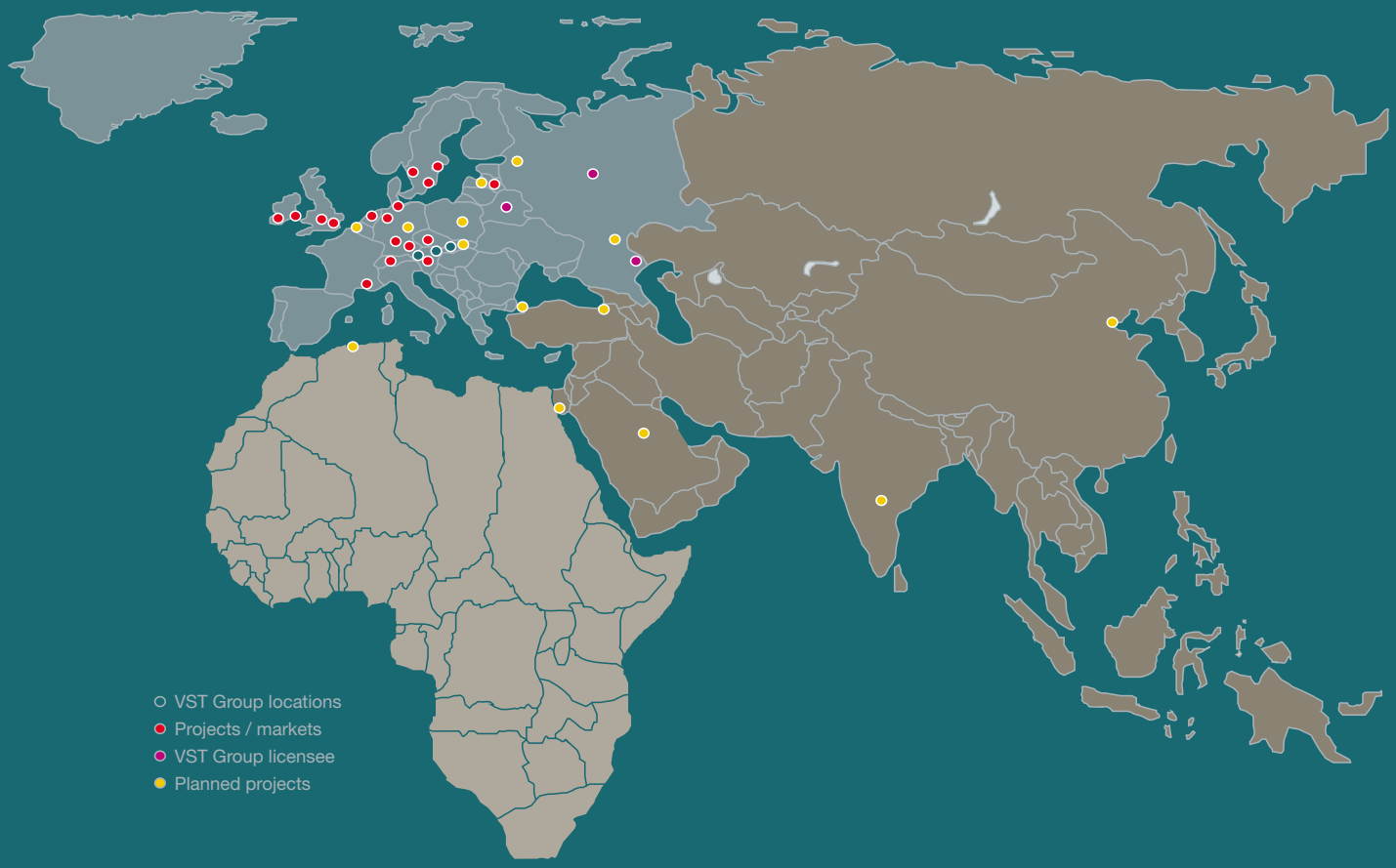
The new VST Technology represents a technological breakthrough in the industrialization of the production of components, because it makes the entire production process much more effective and resource-saving. On one hand, the amount of raw materials used in production is reduced; on the other, the demand for labor is also diminished. Thereby, the total production capacity has more than doubled in the Nitra factory; from 180,000 square meters per year by a further 250,000 square meters per year. A total of 430,000 square meters of VST walls can now be produced per year.

On the VST production site in Nitra, a total of 124 highly qualified employees work in a three-shift system to manufacture the patented VST composite formwork system for “off-site construction” according to individual customer projects. The wall and slab elements produced in the factory form the composite shell and they are transported by either trailer trucks or rail to the site and assembled with precision. It is also possible to collect the VST elements directly from the factory. Corresponding transport cradles/transport tracks are provided by VST.

The VST components are fitted at the factory with all the necessary elements without requiring additional arrangements for formwork, etc. on site. Therefore, a flexible, custom-made and perfectly fitting solution is guaranteed to the customer.

VST BUILDING TECHNOLOGIES AG

Strong partner for modern construction – The key markets



VST BUILDING TECHNOLOGIES AG has many years of experience in the market for composite formwork systems and provides building owners with the specific component solutions for modern building; thanks to its innovative, patented technology. The VST technology is used primarily in residential construction.

Skyyteparken - Stockholm Sweden

The core markets of VST BUILDING TECHNOLOGIES AG, in which the company has been operating successfully for many years, are Germany and Sweden. In addition to supplying components, VST offers raw superstructure works as well as engineering services for building constructions in the German-speaking countries. Many projects have already been completed in this business context, the focus being in the area of nursing homes in the regions of Rhineland-Palatinate, Saarland and the North Rhine-Westphalia.

Ungraren - Stockholm, Sweden

Clarion Hotel Sign - Stockholm, Sweden

Lagbasen - Stockholm, Sweden

Sofielundsvagen - Stockholm, Sweden

In Sweden, the second core market, VST BUILDING TECHNOLOGIES AG is present through its affiliated company VST Nordic AB. This company assumes partial general contractor projects in Sweden. The VST components are manufactured in the factory in Nitra and delivered to Sweden. Further construction works, such as the assembling and concreting of the elements in the field, are provided by the subsidiary VST Nordic.

In Sweden VST cooperates with, among others, the construction company Skanska, one of the largest construction companies in Europe. Skanska has already implemented more than 30 project using VST components. This includes the largest hotel project in Scandinavia, the Clarion Sign in Stockholm with 558 rooms. VST has supplied a total of 19,500 square meters of walls and 23,200 square meters of slabs for this project. VST has also worked with Skanska to complete the first multi-storey passive house, the residential complex Bla Jungfrun in Stockholm. VST delivered approximately 13,000 square meters of walls for this passive house. But also other Swedish companies, for example Thomas Betong AB, are showing a growing demand.

VST BUILDING TECHNOLOGIES AG has reached a leading market position in residential construction in Stockholm. Currently, a total of about 55 percent of the wall elements produced by VST are delivered to the Swedish market.

Jublet - Stockholm, Sweden

Saarburg - Germany

Landscheid - Germany

Landscheid - Germany

VST BUILDING TECHNOLOGIES is also active in the Austrian market, providing components, planning and establishing raw superstructures. For example, a construction project in the Universumstraße in Vienna – 46 suites were built with VST technology – was awarded the Austrian State Prize for Architecture and Sustainability in 2012. This demonstrates the competence of the VST BUILDING TECHNOLOGIES AG in producing high-quality components while promoting environmentally sustainable construction.

VST BUILDING TECHNOLOGIES AG has also already completed projects in the Netherlands through its subsidiary VST Benelux. Projects in Belgium, France, Switzerland, Slovakia and Ireland have all used VST elements that have been delivered and assembled on site. International markets where VST offers technology transfer services in connection with the supply of complete plant facilities, are Russia, Belarus, the Middle East, Turkey, Algeria and China.

Smart Concepts - Dötinchem, Netherlands

Technology transfer and plant facility sales

The excellent knowledge of the highly qualified employees of VST BUILDING TECHNOLOGIES AG and the innovative, patented VST technology are the basis for the second major business segment of the VST BUILDING TECHNOLOGIES AG – technology transfer and plant facility sales.

In the area of technology transfer, the benefit package of the VST BUILDING TECHNOLOGIES AG comprises a comprehensive training program for the employees of the customers. All topics related to engineering, that means the planning of the project, the production, and statics are mediated by the VST subsidiary VPG Verbundsysteme Planungs-Produktions-Baugesellschaft mbH (VPG) in Zell am See, Austria. Training for the production, operation of VST systems, and transport are managed by VST Verbundschalungstechnik s.r.o. in the VST factory located in Nitra. Training for installation of VST elements are performed locally on construction sites operated by VST BUILDING TECHNOLOGIES AG. The knowledge relating to the construction site facilities, discharge of the components, assembly, and concreting is conveyed to the trainees.

From an economic perspective, the innovative VST technology makes the scale of production possible in such countries where the local manufacture of components was not previously feasible. This could have been due to a lack of skilled employees or above-average wage levels. VST BUILDING TECHNOLOGIES AG supplies complete plants to customers in certain regions. The VST plants and machines are produced by selected sub-contractors according to technical plans and specifications set by VST. They are then compiled, tested and prepared for shipping in the VST factory in Nitra.

VST informs the customer, prior to the delivery of a plant facility, regarding the necessary specification for the building in which the plant facility is to be installed. As soon as the building is ready for the occupation, VST assumes responsibility for delivering, installing, and commissioning the machines. Based on the knowledge taught in the training sessions, the customer can now manufacture VST elements. The VST BUILDING TECHNOLOGIES AG grants licenses that are necessary for the production and distribution of the VST elements – this is usually in connection with exclusivity for the geographically limited market of customers.

VST BUILDING TECHNOLOGIES AG requires in advance, the clarification of bureaucratic details regarding the admission of VST construction technology into the customer‘s country. This includes contact information for local authorities; and the transfer of extensive technical documentation, test reports, and certification. VST has developed software that will create a detailed business plan, which will take into account the respective market conditions, in English for the customer. Also, potential customers are invited to visit the VST production plant in Nitra and the current construction sites before making a contractual agreement. VST BUILDING TECHNOLOGIES AG welcomes groups of visitors.

In most cases, joint ventures with VST are in the field of plant facility sales. VST BUILDING TECHNOLOGIES AG is limited to the role of a minority shareholder.

VST is very successful in the field of technology transfer and plant facility sales and has already supplied complete VST plant facilities to customers in Russia and Belarus. With this package VST offers solutions to the customer from a “single mold”, for an extremely efficient production and the highest quality standards in the field of environmentally sustainable construction.

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