

# WS Academy

## CUSTOMISED TRAININGS



[www.ws-akademie.at](http://www.ws-akademie.at)

Your training competence center for the infrastructure system

A joint project of  
ÖBB Infrastruktur AG  
WS Service GmbH  
Weichenwerk Wörth GmbH

# WS Academy







# About WS Academy

WS Academy combines the extensive know-how of the well-esteemed companies ÖBB Infrastruktur AG, voestalpine VAE, Weichenwerk Wörth GmbH and WS Service GmbH. Therefore, WS Academy stands for sustainable knowledge advantage. The aim is to offer a professional training program around the infrastructure system. Having many years of experience and expertise, we offer technical state-of-the-art trainings. The intelligent combination of VAE's product know-how with ÖBB's maintenance and operational prowess guarantees a high-quality practical training.

With three smaller and one large conference rooms, our training center is the perfect location for conferences, trainings, workshops and corporate events of all kinds. Our offer is rounded out by factory tours and individual on-site support.

Located in the south of St. Poelten in Austria, WS Academy is easily accessible by train and car. There is an intercity train from Vienna Airport directly to St. Poelten hourly (duration approx. 1 hour). Guests arriving by train can easily reach the WS Academy - a bus stop of the LUP city bus is located directly in front of the company premises.

## Tailor-made Trainings

Our training programs are specially designed with emphasis on key railway track activities. We cover topics such as turnout & rail technology, all areas of signaling in turnouts as well as inspection & track maintenance. The intelligent combination of VAE's product know-how with ÖBB's maintenance and operational prowess guarantees a high quality, and praxis orientated training for your staff based on state-of-the-art technology.

We offer trainings in our purpose-built training center in Austria, where theoretical lessons can be supplemented with hands on trainings on physical training turnouts and track components.

Additionally we design special courses specific to each customer's needs and can provide our courses at customer premises. The trainings are specially compiled according to your wishes and requirements. We combine the individual topics into a comprehensive training program for you and your employees. Whether you want one intensive training day or a complete training week, contact us for your individual offer.

For further information or if you have any questions please do not hesitate to contact us.



## Contact

Mr. Vojislav Djurdjev  
Ghegastraße 3  
3151 St. Georgen am Steinfelde, Austria  
Phone: +43 664/85 12 790  
e-mail: [office@ws-akademie.at](mailto:office@ws-akademie.at)  
Web: [www.ws-akademie.at](http://www.ws-akademie.at)

# Life cycle of a turnout

The high reliability of the components is a decisive factor in order to ensure high efficiency in the infrastructure system.

With its comprehensive range of trainings, WS Academy offers you the exactly relevant know-how to professionally manage turnouts through their entire life cycle. Through our knowledge advantage, an optimal cost-benefit ratio can be achieved in the economic planning of facilities and also in the case of professional installation.

Track availability and optimized lifecycle costs are the keys to success for efficient maintenance management.

Consequently, a high degree of track availability will become an even more important requirement for all stakeholders associated with the railway infrastructure. The need to maximize track availability on one hand and increasing cost pressures on the other hand require a focus on a more optimized and economic management of the railway infrastructure. Extending asset lifespan and reducing lifecycle costs are the key targets to success for all infrastructure-managing companies.

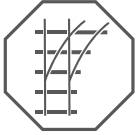
A planned, well-organized and regular inspection and maintenance regime is necessary in order to avoid unexpected downtime, unplanned repairs and related costs.

# Overview

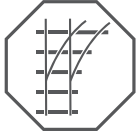
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# Modular Trainings

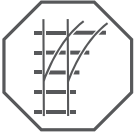
... for Vignol Track

	<u>001</u>	<b>Basics of turnouts for standard-gauge (1435mm)</b>
	<u>004</u>	<b>Basics of DLD-components in turnouts</b>

... maintenance of Vignol Track

	<u>008</u>	<b>Inspection, Service and Maintenance of turnouts</b>
	<u>009</u>	<b>Inspection, Service and Maintenance of turnouts - practical day!</b>
	<u>011</u>	<b>Rail welding</b>

... for grooved Track

	<u>003</u>	<b>Basics of turnout and track components for grooved rails</b>
	<u>010</u>	<b>Inspection, Service and Maintenance for grooved rails and turnouts</b>



# Infrastructure System



# 001 Basics of turnouts for standard-gauge (1435mm)

**description** The seminar conveys the basics, the current technical status and the requirements for turnout technology (Vignol rail) from the point of view of a turnout manufacturer. You get an inside into the design of the turnout up to the optimal use of turnouts and turnout technology.

- topics**
- Technical features of turnouts
  - Design characteristics of turnouts
  - Switch device
  - Closure panel
  - Crossing panel
  - Materials for turnouts

**trainer** expert from voestalpine

**price** on request



## 002 Basics of turnouts for narrow-gauge (<1435mm)

**description** The seminar conveys the basics, the current technical status and the requirements for turnout technology (narrow gauge) from the point of view of a turnout manufacturer. You get an inside into the design of the turnout up to the optimal use of turnouts and turnout technology.

- topics**
- Technical features of turnouts
  - Design characteristics of turnouts
  - Switch device
  - Crossings
  - Materials for turnouts
  - Turnout equipment
  - Layout / Laying plan / Curved turnouts
  - Inspection of turnouts

**trainer** expert from voestalpine

**price** on request

# 003 Basics of turnout and track components for grooved rails

**description** The seminar conveys the basics as well as the current technical status and the requirements for turnout technology. You will get an overview from the set-up of the turnout to the optimal use of turnouts and turnout technology as well as views into the development of turnout technology (materials, laying systems, maintenance technology and drive technology). This also includes basic information on lane guidance (wheel / rail theme), component design, changeover systems and their basic requirements.

- topics**
- Definition turnout
  - Turnout types and systems (standardized terms and designations)
  - Turnout nomenclature (geometric picture, turnout radius, final inclination, components)
  - Rails (profiles and materials)
  - Dependency on turnout geometry and permissible speed
  - Basic knowledge of guidance, impact on component design (tongue device, crossing and check rail)
  - Tongue devices (types, structure and mode of operation)
  - Crossing area (crossing and check rail, types, flat and deep groove)
  - Climbing turnouts - why and how does it work
  - Positioning systems and their basic requirements or tasks
  - Relationships between speed of travel and positioning or locking device
  - Superstructures, stray current insulation, fastening systems
  - Summary of the special features "turnout system" with an impact on planning, maintenance and technology aspects in urban transport
  - Rails - materials, wear behavior, welding suitability
  - Dependency on turnout geometry and permissible speed
  - Calculation of lateral acceleration and its permissible speed-related values
  - Track guidance effect on component design (tongue device, crossing, check rail and track arches), optimization options and limits of component design; Low-floor vehicle technology
  - Tongue devices: designs, choice of materials, special designs
  - Crossing area (crossing and check rails, types, flat and deep groove issues, special solutions, operational experience, special features for maintenance, movable crossing)
  - Climbing turnouts - component design, standard turnouts, areas of application, positioning system and fastening
  - Positioning systems and their basic requirements or tasks - effect on turnout construction, module systems; security technology
  - Superstructures, stray current insulation, fastening systems (closer examination of the requirements for stray current and elastic mounting)
  - Assembly, shipping, transport and logistics - special features depending on the turnout systems and laying system

**trainer** expert from voestalpine

**price** on request



# 004 Basics of DLD-components in turnouts

**description** The seminar conveys detailed knowledge of the structure, function, maintenance and repair of safety equipment on turnouts and includes procedures for failure localisation under operating conditions.

- topics**
- Advantages of our products (compared with others)
  - Geometrical criteria for DLD components (during FAT, during operation)
  - Test sheets – how to use
  - Tools & equipment to inspect and repair
  - Force measurement for point machine for switching
  - Fault detection, fault clearance
  - Preventive maintenance
  - Theoretical and practical training for signaling components in turnouts
    - » Power transmission systems, like Polygon- Torsions & hydraulic transmission system, etc.
    - » Point machines

**trainer** expert from voestalpine

**price** on request

# 005 Basics of rail road sleepers

**description** The seminar gives an insight into the design, production, properties and use of sleepers in the railway superstructure. Different types of sleepers in track and turnouts and their rail fastening systems are shown and the effects of sleepersole on the elasticity of the track system and maintenance and economy.

- topics**
- Overview of sleeper types in turnout construction
  - Wooden and plastic sleepers
    - » Materials / technical standards / possible uses and specific properties of the respective sleeper materials / inspection of sleeper drilling and platform / presentation, discussion on shown objects / shown pieces
  - Concrete sleepers
    - » Overview of precast concrete parts in the railway superstructure / sleeper types including rail fastening systems / sleeper production / sleeper design, approval, testing / sleeper installation, the sleeper in the track / Other precast concrete parts in the railway superstructure / repair options
  - Soling of concrete sleepers
    - » Load transfer track / types of the sole, normative basics / production - application of the sole / sole use in track - turnout / economy / practical examples

**trainer** expert from voestalpine & expert from private sector

**price** on request



# 006 Asset management in the infrastructure system

**description** The seminar conveys the basics of modern, data-based system management for the railway route. The central topics of the first block are the collection and structuring of data in a database-compatible environment, the extraction of information about the state of the system and its deterioration, as well as the forecast-based derivation of measures. The content of the second block is shaped by the economic evaluation of various options for action, the determination of target quantities for sustainable management of the infrastructure and the comparison between available budgets and upcoming projects in terms of prioritizing measures.

- topics**
- Basics of system data
  - Structured data management
  - Measurement-based condition recording of the rail route
  - Data analysis
  - From diagnosis to prognosis
  - Statistical evaluations - global rail track behavior
  - Measure derivation - from cross section to section
  - Project evaluation - technical
  - Average behavior - the standard element approach
  - Relationship between maintenance and service life
  - Basics of economic valuation
  - Components strategies
  - Deriving strategic quantities
  - Project evaluation - economical
  - Prioritization of projects
  - Synthesis in system management

**trainer** expert from Graz University of Technology

**price** on request

# 007 Elasticity of rails and turnouts

**description** The seminar deals with the basics of how elastic polyurethane (PUR) elements work in railway superstructures. The state of the art is conveyed from the perspective of the elastomer manufacturer. You get an overview of the available elastic solutions up to the optimal use in the track and turnout.

- topics**
- Challenge and problems in the superstructure
  - Elastic elements in the track, overview
  - Effects on protecting ballast and protecting against vibrations
  - Optimization options for turnouts, transitions, insulation joints, etc.
  - Practical examples
  - LCC considerations

**trainer** expert from Getzner

**price** on request



Maintenance





## 008 Inspection, Service and Maintenance of turnouts

**description** The seminar teaches the basics for an efficient maintenance of turnouts (vignol) and gives a theoretical overview of turnout geometries and typical errors in turnouts.

- topics**
- Basics about maintenance – international standards
  - Basic training of track components
  - Turnouts
  - Rail expansion joints
  - Insulated rail joints
  - Rail/track (rail-/wheel contact)
  - Preventive maintenance of turnouts, REJ, IRJ
  - Typical failures in turnouts, REJ, IRJ
  - Geometrical parameters
  - Measures to be taken

**trainer** expert from voestalpine

**price** on request



# 009 Inspection, Service and Maintenance of turnouts - practical day

**description** The focus of the seminar is on practical work on the training turnout. The participants measure the turnout, check fastening materials and the clamp lock and correct the guide values. In addition, the turnout is deburred and the tongues are corrected using a hand-held bending machine.

- topics**
- Turnout geometry
  - Wood & concrete sleepers - quality criteria and typical defects
  - Typical defects in turnouts
  - Measuring turnouts with a turnout gauge device
  - Hand-held machines for maintenance work
  - Deburring turnouts
  - Bending tongues
  - Setting of clamp lock device (TEMPLEX I, TEMPFLEX III)
  - Hands on training
  - Inspection of turnouts, REJ and IRJ on track
  - Geometrical
  - Ultrasonic testing
  - Geometrical adjustment
  - Grinding of turnouts

**trainer** expert from voestalpine

**price** on request

# 010 Inspection, Service and Maintenance of grooved rails and turnouts

**description** The seminar provides common measures for the inspection, maintenance and repair of grooved rail systems.

- topics**
- General maintenance
  - Inspection and maintenance of grooved rail turnouts
  - Tongue rail device
  - Crossing and check rail
  - Forms of wear and repair
  - Turnout inspection and condition assessment
  - Guidelines for repair and build up welding
  - Interchangeable turnout tongue rail with wedge attachment
  - Turnout Diagnostic System

**trainer** expert from voestalpine

**price** on request

# 011 Rail welding

**description** This seminar covers all commonly used rail welding procedures. Welding procedures and consumables, as well as grinding of welds will be discussed in detail. The metallurgy of rails, the basis of rail welding, will be presented in a simple way.

- topics**
- Metallurgy of rails and the impact of rail metallurgy on rail welding - Why do have rails the chemical composition as they have?
  - Chemical composition of rails, rail geometry and the impact of both on welding technology
  - Flash butt welding – stationary and mobile machines process description and assessment of welding programs
  - Aluminothermic welding of Vignol and grooved rails process and critical factors for a successful weld
  - Innershield and stick welding of Vignol and grooved rails
  - Choice of welding consumables
  - Grinding of welds – the most important process step at rail welding
  - Weld failures and how to avoid them
  - Best practise

**trainer** expert from voestalpine

**price** on request



# 012 Turnouts - defects and repair

**description** The seminar offers an insight into the world of repair welding of turnout parts. It deals with examining the damaged areas of the turnout and correcting the errors correctly. An insight into the possible test devices for determining rail damage and an insight into the welding of special steels materials as Manganese.

- topics**
- Rail-/Wheel contact
  - Crosses
    - » Wear & defects in turnouts; measures to avoid and repair
    - » Defects; measures to avoid and repair
  - Aluminothermitwelding
    - » Theory
    - » Distressing
  - Practical training in 2 groups
    - » Repair welding on crosses MN - grinding
    - » Aluminothermit welding - grinding
  - Non-destructive testing
    - » PT-testing
    - » Ultrasonic testing
    - » Eddy current testing
    - » Magnetic particle inspection

**trainer** expert from voestalpine

**price** on request

# 013 Track care with lubrication- and conditioning systems

**description** The seminar covers all common rail lubrication and conditioning devices. Topics such as coefficients of friction between the wheel and rail, advantages such as the service life of the rail and wheels, as well as safety aspects in connection with rail lubrication and practical knowledge will be discussed.

- topics**
- Wheel / rail contact, stick slip effect and resulting problems
  - Which contact points should be lubricated / conditioned and why
  - Solution approaches, different lubrication systems - stationary and mobile
  - Explanations and differences to friction modifier and lubricant materials
  - Significance and necessity of coefficients of friction between wheel and rail, taking into account safety aspects such as braking effect and traction
  - Mode of action and efficiency of lubrication systems
  - Different methods of application
  - Innovative, contemporary approaches to optimize rail care
  - Achievable results based on studies and long-term measurements in connection with noise projects and material wear

**trainer** expert from HY-Power

**price** on request

# GENERAL TERMS AND CONDITIONS FOR CUSTOMISED TRAINING PROGRAMMES

1. Bookings / Orders
  - 1.1. The customer's order is based on WS Service GmbH's offer for the implementation of customised training programmes and must be made in writing.
  - 1.2. Every order is confirmed in writing by email.
2. Invoices and Payment Terms
  - 2.1. The prices indicated for customised training programmes are net prices.
  - 2.2. Invoices will be sent to the address provided by the customer after the training has been completed.
  - 2.3. The invoiced amount is due for payment immediately upon receipt of the invoice and should be paid into WS Service GmbH's account, which is indicated on the invoice.
  - 2.4. If the customer defaults on a payment, WS Service GmbH is entitled to charge interest on arrears at the statutory rate.
3. Cancellations
  - 3.1. Cancellations may only be made in writing. Cancellations can be made free of charge up to 31 calendar days before the training is due to take place. Cancellations received less than 31 calendar days before the training is due to take place will be subject to a cancellation fee of 50%. For cancellations received from the seventh day before the start of the training, the full agreed fee/price will be charged.
  - 3.2. The contracting parties are entitled to withdraw from the contract in whole or in part at any time for important reasons attributable to the sphere of the other contracting party. An important reason attributable to the sphere of the other contractual partner is deemed to exist particularly if
    - a) bankruptcy proceedings have been instigated against the assets of the other party, or the petition for bankruptcy has been dismissed due to lack of assets to cover the costs, or
    - b) the company of the other party goes into liquidation, or
    - c) a claim for compensation is made in respect of the contracting party's company.
4. Changes to Bookings
  - 4.1. Due to the long-term planning involved, the organisers reserve the right to make organisational changes to the programme for reasons beyond their control, such as changing dates and/or trainers and cancelling events. The customer will be informed of such an eventuality in a timely and suitable manner. A change of trainer or postponement of the course does not entitle the customer to withdraw from the contract or to reduce the fee, provided that the subject matter and level of the course are not significantly affected.
  - 4.2. If an event is cancelled due to an instructor's illness or other unforeseen event, there is no entitlement for the event to take place. Compensation for expenses incurred and other claims against WS Service GmbH cannot be derived from this. The same applies to postponements or changes to the timetable of the agreed customised training programme, which may become necessary at short notice.
5. Warranty conditions
  - 5.1. WS Service GmbH does not guarantee the success of the training.



6. Data Protection

- 6.1. WS Service GmbH, Ghegastraße 3, A-3151 St. Georgen am Steinfeld, FN 408141h is responsible for the processing of personal data arising from the organisation's handling and documentation of customised training programmes. The contact details of WS Service GmbH's data protection officer and further information on data protection can be found at [www.ws-akademie.at](http://www.ws-akademie.at).
- 6.2. If the customer provides data of natural persons different from him/herself (e.g. seminar participants or contact persons) in the context of contacting or booking customised training programmes, the customer is obliged to inform these persons of the privacy policy, available at [www.ws-akademie.at](http://www.ws-akademie.at).

7. Disclaimer

- 7.1. WS Service GmbH assumes no liability for personal belongings of participants, including any learning materials provided. No liability claims can be made against WS Service GmbH from the application of knowledge acquired within the framework of the WS Academy GmbH.

8. Applicable Law, Place of Jurisdiction

- 8.1. This contract is exclusively subject to Austrian law, to the exclusion of UN sales law and international private law.
- 8.2. The contracting parties shall attempt to settle any disputes arising from or in connection with this contract, including questions about its validity, amicably in the first instance. Should this not prove possible within a reasonable period of time, the jurisdiction of the relevant court in St. Pölten shall be agreed for any disputes arising from or concerning this contract.

9. Miscellaneous

- 9.1. All teaching materials issued within the scope of the training courses may only be used and in particular duplicated, distributed, made accessible to the public or put into circulation with our express consent.
- 9.2. The participants of the training courses must follow the instructions of the trainer.
- 9.3. Any changes and additions to the contract must be made in writing.
- 9.4. Should one or more provisions of this contract be or become invalid, ineffective, unworkable or unenforceable, such a defect shall not affect the remaining provisions of this contract. Any defective provision shall be deemed to be replaced by a valid, effective, workable and enforceable provision that comes closest to the economic and legal effects which the parties to the contract expected from the defective provision. Headings in this contract are for convenience only and do not define or limit its terms.
- 9.5. General and other contractual terms and conditions and suchlike of the customer are invalid, even if WS Service GmbH does not contradict them. Agreements deviating from the terms and conditions stipulated here are only legally effective if they are confirmed in writing by WS Service GmbH in the order confirmation.
- 9.6. The customer is obliged to maintain secrecy concerning the information (trade secrets) that comes to his attention in the course of the fulfilment of the contract. S/he must also impose this obligation on the participants of the training courses.



# Hotel Recommendations

**FOR WS ACADEMY - ST. GEORGEN AM STEINFELDE, AUSTRIA**

## **CITYHOTEL DESIGN & CLASSIC**

Völkplatz 1, 3100 St. Pölten, Austria

Phone: +43 2742 755 77

Web: [www.cityhotel-dc.at](http://www.cityhotel-dc.at)

E-Mail: [office@cityhotel-dc.at](mailto:office@cityhotel-dc.at)

## **HOTEL METROPOL**

Schillerplatz 1, 3100 St. Pölten, Austria

Phone: +43 2742 70700

Web: [www.hotel-metropol.at](http://www.hotel-metropol.at)

E-Mail: [office@hotel-metropol.at](mailto:office@hotel-metropol.at)

## **HOTEL-GASTHOF GRAF**

Bahnhofplatz 7, 3100 St. Pölten, Austria

Phone: +43 2742 35 27 57

Web: [www.hotel-graf.at](http://www.hotel-graf.at)

E-Mail: [office@hotel-graf.at](mailto:office@hotel-graf.at)

# Taxi Recommendations

## **AUSTRIAN AIRPORT TRANSFER**

Heinrich Schneidmadl-Straße 15, 3100 St. Pölten, Austria

Phone: +43 2742 37737

## **RITTNER TAXI GMBH & CO KG**

H.-Schnofl-Straße 10, 3100 St. Pölten, Austria

Phone: +43 2742 208

## **TAXI MIT HERZ GMBH**

Dr. Hans Hörlerstraße 1, 3100 St. Pölten, Austria

Phone: +43 2742 72000

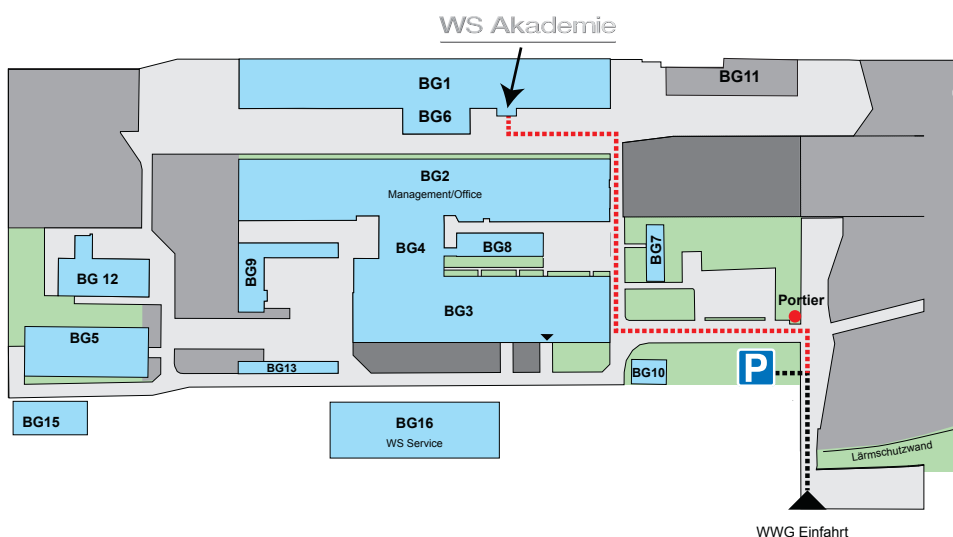
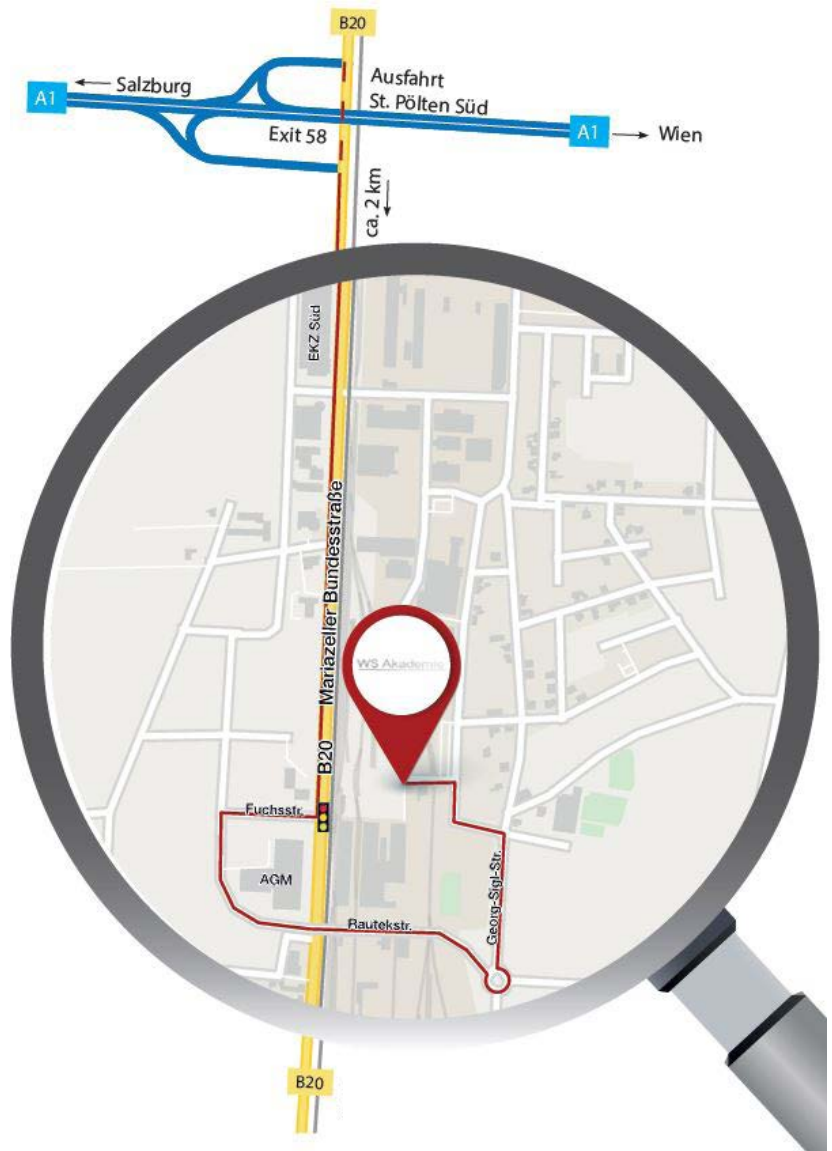
# Finding us

## Arrival by car

- Coming from motorway "A1"
- Exit 58, St. Poelten Süd
- Take the Bundesstrasse "B20" direction Traisen/ Wilhelmsburg/Mariazell
- Continue straight ahead for about 2 km and turn right into Fuchsstrasse at the traffic light between the companies "Best4Forst" and "AGM"
- At the T-junction turn left towards the bridge and follow the road until you reach the roundabout
- Take the second exit at the roundabout towards Hart
- At the town-sign of Hart turn left
- Following this road, our premises are located on the left handside
- A parking area for guests of the WS Academy is behind the noise protection wall
- The main entrance to our premises is directly adjacent to the parking area

## Arrival by airplane & train

- From Vienna International Airport Connection to St. Poelten by train, duration approx. 1 hour
- There is an intercity train from Vienna Airport directly to St. Poelten (hourly)
- You can search for train times here:  
<http://fahrplan.oebb.at/bin/query.exe/en>
- Main train station: St. Poelten Hauptbahnhof
- City Bus LUP line 1, direction St. Georgen, stop: Peter-Anichstrasse
- Of course we can also organize for you a transfer from the train station, if needed.



## Factory premises

The walkway to WS Academy leads through the premises of Weichenwerk Wörth GmbH. Upon arrival, please check in at the porter's cabin of Weichenwerk Wörth GmbH.





**ÖBB-Infrastruktur AG**  
Praterstern 3  
1020 Vienna, Austria  
[www.oebb.at/infrastruktur/de/](http://www.oebb.at/infrastruktur/de/)

**WS Service GmbH**

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**WS Service GmbH**  
Ghegastraße 3  
3151 St. Georgen am Steinfelde, Austria  
[www.wsservice.at](http://www.wsservice.at)



**Weichenwerk Wörth GmbH**  
Ghegastraße 3  
3151 St. Georgen am Steinfelde, Austria  
[www.wwg.co.at](http://www.wwg.co.at)

[www.ws-akademie.at](http://www.ws-akademie.at)

**WS Academy**  
Ghegastraße 3  
3151 St. Georgen am Steinfelde, Austria  
Phone: +43 664/85 12 790  
E-Mail: [office@ws-akademie.at](mailto:office@ws-akademie.at)

**WS Academy**

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