It’s all about people.

“Tell me, and I will forget.
Show me, and I may remember.
Involve me, and I will understand.”

Confucius

Fire fighting in road and rail tunnels – training services for fire brigades

Courses, workshops and training

www.ifa-swiss.ch
The International Fire Academy has been training fire service personnel to fight fires in underground transportation facilities since 2009. Since then, more and more fire brigades from all over Europe have been preparing themselves in the tunnel training facilities in Balsthal and Lungern for fire and rescue deployment in road and rail tunnels. They also utilise the knowledge and experiences gained for other facilities with large penetration depths, for example industrial complexes with extensive fire zones.

Nowadays, different groups are requesting the services of the International Fire Academy:
- With the support of the International Fire Academy, authorities can develop tactical principles and standards for deployment in underground transportation facilities.
- Tunnel fire brigades take advantage of the specialist knowledge and infrastructure for the development of their deployment concepts and systematic preparation for deployment.
- Local authorities send their fire service personnel that are responsible for tunnel complexes to Switzerland for training.
- Construction principals and their contractors have their search and rescue teams trained by the International Fire Academy for their tunnel projects.
- Airport fire brigades that are also responsible for underground transportation facilities undergo advanced training at the International Fire Academy.
- Fire academies offer their own advanced training courses in cooperation with the International Fire Academy.

This brochure gives examples of the different training opportunities available.
Tunnel fires present a particular kind of challenge. Consequently, the International Fire Academy was commissioned by the Swiss government with the task of developing, planning and building special tunnel training facilities for fire services and other emergency services, as well as developing a tunnel firefighting training course. After the International Fire Academy had trained most of Switzerland’s tunnel fire brigades, the tunnel training facilities were then also made available to fire brigades from Europe and beyond.

Not many years ago, tunnel fires were regarded as being virtually impossible to extinguish. In the meantime, the following fact has come to light: most vehicle fires in tunnels are extinguished before any great damage and/or injuries occur. Speed is of the essence: the faster a fire is extinguished, the greater the chance of rescuing people and limiting immediate and consequential damage. This is why the International Fire Academy focuses on the initial deployment phase and its preparation.

The tactics and techniques taught by the International Fire Academy today were developed and continue to be further optimised in cooperation with fire services from Switzerland, Germany, Austria, Italy, France, the Netherlands and Belgium. As a result, a procedure that is essentially standardised evolved which is now being adopted by more and more fire brigades. This results in improved legal security, especially for fire crew commanders. At the same time, the following applies: every tunnel is different and every fire brigade has different options. Therefore, the “basic training” must always be adapted to suit local conditions. The training consultants of the International Fire Academy are also able to offer support here.

When deployed, fire crews do what has proved to be successful in the past. However, in some rare incidents, such as tunnel fires, previous deployment experience is often lacking. This means there is too little in the way of reliable know-how to fall back on. Therefore, the International Fire Academy practises didactics based on experience: they are not only teaching the right things according to current findings, but also provide a world of experience, in which fire brigades can find out for themselves how they can implement the Swiss tunnel deployment tactics to suit their needs best.

The International Fire Academy offers the most varied tunnel training facilities in the world. Course participants are able to experience tunnel deployment conditions with all their senses and gain valuable experience. They increase their efficiency, as well as deployment safety for themselves and tunnel users.

Our teaching method: up-to-date and fit for purpose

Increased (legal) security for all thanks to a standardised procedure

Speed is of the essence
Training courses offered by the International Fire Academy
The International Fire Academy basically only trains firefighters when assigned by a fire service authority, a fire service academy or on behalf of other authorities (for example fire service inspectorates and national or regional fire service authorities).

*This is the only way to ensure mutual compatibility of strategy, tactics, and techniques.*

Consequently the International Fire Academy offers training courses for either management personnel only or fire brigades (in other words management personnel and crew).

The matrix below gives a summary of target-group orientated training courses offered.

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<td>Conditions of deployment, theoretical fundamentals, tactics and technique are known</td>
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<td>Conditions of deployment are experienced intensively, Members of own fire brigade</td>
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The International Fire Academy differentiates:

- Training courses for individual persons who want to make themselves familiar with the Swiss tunnel deployment tactics, in order to then decide which tactical and technical deployment elements are suitable for their brigade and should therefore be adopted.

In this way the International Fire Academy trains disseminators from different fire brigades together on the same course, for example on behalf of the Baden-Württemberg state fire service and in collaboration with the state fire academy in Bruchsal, who then use the knowledge they have gained to prepare members of their own brigades for deployment in tunnel fires.

- Brigade personnel training courses, in which management personnel and crews from the same fire brigade take part (or for example two brigades responsible for a single tunnel).

As the training for deployment in road tunnels best imparts the necessary basics, the International Fire Academy offers courses for just road tunnels as well as combination road and rail tunnel courses. Courses purely for rail tunnels are run exclusively in direct cooperation with the appropriate rail companies.

- Training courses on behalf of authorities or in cooperation with fire academies, rail companies or other operators of underground transportation facilities.

The training objectives differ in terms of the depth of experience and training.
Our infrastructure for realistic training
In the training facilities and tactics centre of the International Fire Academy, practically all conceivable incident scenarios in tunnels and underground transportation facilities can be simulated and trained under conditions near to reality.

Road and rail tunnels in Balsthal
Using a 1:1 scale, a section of tunnel with all the traffic and safety equipment relevant for firefigthers has been specially designed and constructed as an exercise tunnel in Balsthal. Amongst other things, this tunnel has
- 4 portals with well-proportioned forecourt areas,
- a parallel overpressure ventilated safety tunnel with shelter area,
- single and double lane sections,
- a transverse tunnel accessible by vehicle with a lock function as a connection to a second tunnel,
- illuminated emergency exits with sliding doors,
- SOS emergency niches and boxes,
- plenty of horizontal and vertical emergency escape routes,
- transverse connections, even under the traffic areas,
- an underground rail halt with vertical and horizontal accesses,
- verges (footpaths) etc.

The road tunnel is equipped with a large number of real cars, trucks, and coaches, in order to be able to replicate complex scenarios too such as a multiple pile-up.

In addition, a section of rail tunnel with both single and double track sections (with ballast or let into the road surface) as well as rail halt provides training facilities for deployment alongside or inside railway vehicles.

Using the natural gas-fuelled fire-simulation systems, different fires in cars, a van, a coach and an HGV, as well as passenger carriages and freight wagons can be controlled, depending on the behaviour of the course participants. More fire points are integrated into a training car park.

Obscured visibility is created using artificial smoke, which is non-hazardous and leaves no residues.
In the 150 metre-long fire tunnel in Lungern, worst-case scenario training can be offered on a situation with two trucks fully ablaze, which is similar to the fire incident in the St. Gotthard road tunnel in 2001. The fire scenarios are fuelled by propane gas.

Access to the fire tunnel is possible via a safety tunnel, one transverse tunnel accessible by vehicle and two accessible on foot.

In the TechnoTunnel, construction site situations can be represented with, amongst other things, rescue containers and construction machinery. This tunnel is located in the excavation with a rough floor, to realistically simulate the particular working conditions when building or renovation work is going on.

Thanks to the combination of fire tunnel, safety tunnel and TechnoTunnel, approach routes filled with smoke up to a length of 400 m can be offered: ideal conditions for training with compressed air or closed-circuit breathing equipment.

Facilities for both theory and practice
The training facilities are further enhanced by a tactics centre, classrooms, accommodation and catering services.

Breathing apparatus, fire appliances and all the equipment necessary for firefighting are provided or participants can bring their own if they prefer. In general, course participants bring their own firefighting clothing with them. On request, the International Fire Academy provides this equipment too.
A broad range of practical training
Many factors influence training planning, in order to be able to offer customised programmes to different target groups. The training of search & rescue crews and airport fire brigades, as well as cooperation with other fire academies which are examples of the broad range are presented here.

Search and rescue teams prepare themselves for deployment

The construction or repair of tunnels present challenges in terms of protective fire safety measures that cannot be covered by the standard services of a local fire brigade. Basically, therefore, rescue teams must be guaranteed by the particular construction company Only under special conditions a local fire brigade can take on these duties. In both cases, the prerequisite is that special equipment and training are guaranteed. In any case, the local fire brigade is to be involved in project planning in advance – preferably two years before the start of construction.

The International Fire Academy can assist this preparation for deployment with its know-how and the training opportunities in its tunnel training facilities. The following instances of cooperation are typical examples here:

– The management personnel of the Reutlingen fire brigade optimised their deployment plan for the construction phase of the Scheibengipfel Tunnel in collaboration with the instructors of the International Fire Academy in the tactics centre in Balsthal. Based on this, a tailor-made training course was developed for the Reutlingen fire brigade and carried out in Balsthal and Lungern.

– The Baden-Baden fire brigade cooperated with the Swiss instructors in order to prepare themselves for protective fire safety measures during the restoration of the Michaels Tunnel.

The TechnoTunnel in the Lungern training facilities is a special training area for search and rescue teams, in which different construction site situations can be replicated.

Fire academies put their trust in infrastructure and know-how

Fire academies from Germany and Austria offer training courses in the tunnel training facilities of the International Fire Academy for fire service personnel from their catchment areas. They work together with our experienced instructors in the Balsthal and Lungern facilities. In this way, disseminators, amongst others, can be trained to introduce their own fire brigades to the findings and experiences they have learned in the preparation of deployment and tunnel firefighting.

After pilot projects, this cooperation service of the International Fire Academy was officially launched in 2013 and has already been used by several fire academies in its first year, such as the Baden-Württemberg state fire academy and the Thuringia state fire and disaster protection school.
Comprehensive solution to
tunnel deployment problems
Since the decision to build the tunnel training facilities in 2001, the training options and practical deployment have been discussed intensively in the didactics and development team of the International Fire Academy. They have continued to develop and improve their deployment instruction and practical training. As a result, we now have a comprehensive solution for dealing with incidents in tunnels which can be adapted to suit particular circumstances and regulations.

Fire academies can draw on the comprehensive development that has already been done and benefit from the experienced teaching personnel of the International Fire Academy and its organisational support.

The International Fire Academy is certified as an instructional organisation according to quality standard ISO 29990. In 2012, its tunnel deployment training course was approved by the Swiss fire service inspectorate’s conference.

Partners for planning and implementation
The International Fire Academy is available to interested fire academies as a partner in the planning, announcement and implementation of training courses in Balsthal and Lungern. This applies in particular
- to the coordination of content,
- in the event of any questions on compatibility with particular valid service regulations,
- on setting up theoretical and practical training.

Airport fire brigades
train for deployment in UTF
Many airports are linked to local and long-distance traffic networks by rail. Stops are frequently located underground with immediate access to terminals. Extensive underground facilities are also connected to access roads and other transport links. This increases the potential deployment range of airport fire brigades to include these underground transportation facilities (UTF).

Again here special deployment preparation including development of deployment tactics is necessary in order to be able to deal with incidents quickly and with a satisfactory level of safety for the firefighters involved. Examples of this area of training offered by the International Fire Academy are collaboration with, for instance:
- the Berlin-Brandenburg airport fire brigade (G)
- the Brussels airport fire brigade (B)
- the Zurich fire brigade (CH)
- the Schiphol airport fire brigade, Amsterdam (NL)

Individual exercise scenarios
The variety of possible exercise scenarios in the tunnel training facilities of the International Fire Academy also offers training opportunities appropriate for airport fire brigades. In addition, considerations relating to the preparation of deployment can be simulated in the tactics centre and different possible incident scenarios can be simulated. Instruction and practical training are adapted to suit the particular facilities individually agreed with the instructors. Exercises on the actual airport grounds can also be supervised by instructors from the International Fire Academy in order to implement the Swiss tunnel deployment training course duly adapted to suit the particular local conditions.
Our international courses

Compact course road & rail

In the two-day road & rail compact course, we make you familiar with the special conditions of deployment at great penetration depths, instruct you in the most important theoretical fundamentals using case studies and introduce you to the tactics and techniques required for deployment in road and rail tunnels. You do not have to be able to use breathing apparatus for this course.

Your benefits: giving up little of your time, you become acquainted with the problems of deployment in tunnels and the International Fire Academy’s instructions for deployment.

Intensive course road & rail

The road & rail intensive course lasts four days (around five days including travel to and from the academy) and has been devised especially for management personnel and training supervisors. You experience and learn everything necessary to be able to develop a deployment concept for “your” fire brigade for “your” road or rail tunnel.

Your benefits: to understand all about the topic of fires in road and rail tunnels and to be able to develop your own solutions.

Intensive course road

The intensive road tunnel course corresponds to the intensive road & rail tunnel course, but without the rail element, meaning the course only lasts three days (around four days including travel to and from the academy).

Your benefits: to understand all about the topic of fires in road tunnels and to be able to develop your own solutions.

Detailed information can be found on our website: www.ifa-swiss.ch/courses

Captions

Road tunnel
Rail tunnel
Course language: German
Course language: English
Course language: French
Course language: Italian
Management personnel
Fire crews
Course length: 2 days
Course length: 3 days
(instruction on 4 days)
Course length: 4 days
(instruction on 5 days)
Course length: 5 days
Course location Balsthal
Course location Lungern
Simulation exercises
Training in intensive fires
Capability to use breathing apparatus mandatory
Breathing equipment provided
Intensive training
Excursion to tunnel complexes
Single room with bathroom
Twin bed room with bathroom (can be used as single room with supplement)
Full-board
Free parking, also for large vehicles

www.ifa-swiss.ch
### Individual training programmes

The content, scope and participants of these training programmes are defined together with the particular fire brigades. Building on existing deployment concepts (or as part of the programme developed together) management personnel and crew are trained intensively. These training programmes can be run in their entirety at our sites in Balsthal and Lungern or fully/partially at the location of your fire brigade. This programme is of particular interest to fire brigades that “inherit a tunnel” or whose tunnel complexes are renovated, as well as search and rescue teams.

**Your benefits:** optimal training is achieved with the least possible expenditure thanks to the precise adjustment of the programme to suit the requirements of your fire brigade.

### Training

We can offer tailor-made training for every job, for example tactical training or training for firefighters using closed-circuit breathing apparatus. We would be pleased to put together an offer to suit your training requirements precisely.

**Your benefits:** increased safety for firefighters thanks to routine training sessions.
The International Fire Academy has a pool of 40 instructors from Switzerland and other European countries. These instructors offer training in four languages: German, English, French and Italian.

Over 2,000 fire service personnel are trained every year in our tunnel training facilities. Here are comments from some of them:

“The training conditions were extremely realistic and therefore highly informative for us. It taught us to have more respect for suchlike incidents, but at the same time we were able to acquire a certain confidence when it comes to fighting tunnel fires.”

Thomas Greuter, Training Officer and Platoon Head, Landeck Fire Brigade (A)

“The feedback from our fire crews has been positive throughout. Particular mention was made of the high level of professionalism, in-depth know-how and the exciting, highly instructive programme.”

Thomas Bettler, Intervention Manager, Swiss Federal Railway (CH)

“This is the only fire service academy of its type in Europe – if not in the world. Here at the International Fire Academy, you can practise every conceivable scenario in tunnels very realistically, without having to put a tunnel out of service for training purposes. Every fire brigade should avail themselves of the opportunity and train here.”

Torsten Hinsche, Deputy Chief Officer, Head of the Hazard Prevention Division, Erfurt Municipal Fire Brigade (G)