

Fire Safety for the PHOENIQS AI Supercomputer

A supercomputer never sleeps. It runs around the clock, generates extreme waste heat, and represents an enormous asset value — conditions that place very different demands on fire safety than a conventional office building. The uptownBasel innovation campus is home to one of Switzerland's most powerful AI infrastructures: the PHOENIQS AI Supercomputer. That such a facility requires a tailor-made fire safety concept goes without saying — what that concept looks like, and what makes it special, is explained by Stefan Bühlmann.

Bühlmann is a certified fire safety expert (VKF) and specialist in fire alarm systems, certified under the guidelines of the Association of Cantonal Fire Insurers (VKF), the governing standard for fire safety in Switzerland. Through his company, [safetyfocus GmbH](#) Brandschutz (Diegten, founded in 2014), he handles a broad range of projects — from small buildings to commercial and industrial properties and complex mixed-use developments. The scale and pace of the uptownBasel project led him, among other things, to set up an additional office directly on site, so that someone is always available on the campus when needed. At uptownBasel, Bühlmann is personally responsible for the fire safety concept — for the entire site, not just the supercomputer.

People first — always

Fire safety law is unambiguous in its priorities: people must be able to reach safety first, and protection of assets comes second.

“People must be able to escape — that's a legal requirement,” — Stefan Bühlmann

For the PHOENIQS AI Supercomputer, however, it quickly became clear that minimum protection would not be sufficient. The asset value of the system is enormous — a fire that ran its course under minimum statutory requirements would have catastrophic financial consequences. An enhanced protection concept was therefore developed from the outset: early detection, automatic sensing of smoke and heat, and a nitrogen suppression system that displaces oxygen in the event of a fire without leaving any residue.

Fire risks: heat, electricity, and cooling

The fire risks of a supercomputer differ fundamentally from those of an ordinary building. According to Bühlmann, they arise less from typical building use and more from high-current loads, power supplies, continuous load, and plug connections that heat up under load, spark, and can melt their insulation.

Cooling is particularly critical: the basement houses a large cooling unit that supplies the supercomputer with air cooling. If it fails, the system generates extreme waste heat — temperatures above 100 degrees Celsius are possible. At such temperatures, a fire can start even without an open flame. Monitoring of the cooling system therefore runs continuously — the responsibility of PHOENIQS or a company commissioned by them. Bühlmann is clear on the distinction: that is operations, not fire safety. His task is to prevent a fire from growing — should one occur at all.

Two-stage early detection and nitrogen suppression

A pipe system runs through the room, continuously drawing in air and testing it for the smallest smoke particles — finely calibrated to detect even minimal concentrations. If it triggers, a message is sent immediately to the fire department. The suppression system itself, however, only activates once a second, independent detector also raises an alarm — either a further pipe-based aspiration system or a conventional smoke detector on the ceiling or in the raised floor.



© safetyfocus GmbH – Sealing of ventilation

“It always takes two independent triggers” — Stefan Bühlmann, to activate the suppression system

If one of the fire detectors triggers, ventilation shuts off and doors close automatically. On the second fire alarm, the nitrogen suppression system activates. Cooling deliberately continues to run: it has no connection to the fire and, if anything, has a positive effect by further cooling the room, says Bühlmann.

Fire department access — even at night



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One of the central design challenges is accessibility: the fire department must have access to the secured rooms at all times — including nights and weekends, without anyone from the operator on site. At the same time, the rooms are protected against break-ins. The solution is a key safe, a so-called “shark cylinder,” in which the fire department has deposited a master key giving it access to all relevant rooms.

Supercomputer and quantum computer: separate fire compartments

The fire safety concept for the supercomputer and the quantum computer is structurally similar, but the areas are clearly separated spatially. Several rooms with 30 minutes of fire resistance lie between the two systems — in the event of a fire, Bühlmann notes, it would take nearly 90 minutes for a fire to reach the other area. In a real emergency, the entire building is evacuated: protecting people always takes priority.

Maintenance, testing, and continuous monitoring

All components are tested individually on a regular basis, followed by an integrated overall test — triggering detectors, shutting down ventilation, closing doors, activating the suppression system. The most recent such test took place on a Saturday, together with all trades involved: ventilation, electrical, safety officers, and contractors. Such comprehensive tests take place at least every four years; fire doors are inspected annually.

Because Bühlmann himself is on site so often, an additional four-eyes principle naturally emerges during ongoing operations. He is always consulted during renovations, to ensure the concept stays up to date.

Mixed use as the biggest challenge

The biggest challenge on the site, according to Bühlmann, is mixed use: office space with high occupancy on one side, technical rooms with little staff but high asset value on the other. Each area requires an individual, proportionate protection concept — a complexity that distinguishes uptownBasel in particular as a campus home to companies from deep tech, medtech, and innovation.

Bühlmann approaches fire safety from a technical perspective — he is interested in prevention, not firefighting.

“Ideally, a fire never starts in the first place.” — Stefan Bühlmann

That uptownBasel considers safety from the very beginning and invests in the infrastructure for it is, in his view, not something to take for granted — but rather the foundation that makes such concepts achievable at all.

Would you like to learn more about Stefan Bühlmann? This time, he is our guest in our [“Seven Questions...”](#) series.