

# Laboratory Safety

## Fire protection and prevention in laboratories with biosafety levels S1 - S4

The field of biotechnology has experienced a rapid growth over the past twenty years. Worldwide, new methods have expanded the potential of traditional biotechnology. Modern processes often involve the manipulation of living cells as well as biochemical reactions with living cells or cell components.

**It is always paramount to avoid any potential for danger to humans, animals and the environment.**

A number of laws, regulations and guidelines must be observed when constructing and operating laboratories with biosafety levels S1 to S4.

These include in particular the contents of the gene technology act (Gentechnikgesetz, GenTG) and the genetic engineering regulations (Genesicherungsverordnung, GenTSV), as well as the biosubstance regulations (BioStoffV) and the technical regulations for biological agents (TRBA 100).

In addition, the state of North Rhine-Westphalia has issued a set of guide-

lines regarding fire protection in genetic engineering facilities (MEckPGenA), and a number of construction regulations are also valid, including the building code recommendations (Muster-Bauverordnung, MBO) and the recommended guidelines for the dimensions of retention channels for fire-extinguishing water containing contaminants (MLöRüRI).

A "moderate" to "high" risk for human health and the environment is assumed for laboratories with biosafety levels S3 and S4 (as described in §7 Section 1 of the gene technology act).

Thus a number of administrative measures must be set out in an emergency plan and adhered to in case of fire. The following additional precautions must be observed:

- **The safety of employees must be ensured at all times**
- **The fire must be entirely extinguished**
- **The room must be sealed off**

- **The defined sub atmospheric pressure and proper ventilation must be maintained**
- **Toxic fumes must be prevented from escaping into the environment**
- **Penetration of water into the environment must be kept to a minimum**
- **Fire-fighting personnel may not be exposed to additional hazards**
- **The water used to extinguish the fire must be properly collected and thermally or chemically neutralized**



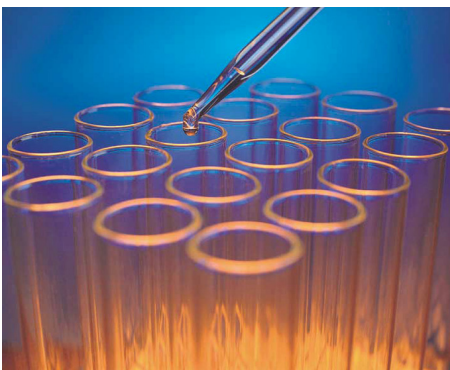
## The Smarter Way of Fire Fighting

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In its position paper on "Fire-extinguishing systems and water retention in laboratories with safety levels S2 and S3", the panel of experts for laboratory technology (ELATEC), a task force of the Committee for Biological Agents of the Federal Institute for Occupational Safety and Health expressly recommended high-pressure water mist for extinguishing fires and included it in its technical regulations for biological agents (TRBA 100, "Protective measures for specific activities involving biological agents in laboratories").

Water has been used for many years to extinguish fires, but only in the past decade did people come to realize that water mist systems in their most effective form – namely high-pressure water mist – are ideal for use in laboratories. When water is subjected to high pressure and forced through specially developed nozzles, it produces very fine droplets that disperse throughout the room and reach even hidden fires.



Unlike conventional gas-extinguishing systems, the FOGTEC high-pressure water mist system ensures high safety in laboratories. Because it poses no danger to humans, the FOGTEC system can be activated immediately, with no prior warning.

As a result of the water being atomized at high pressure, the surface area available for cooling is considerably greater than that of conventional low-pressure systems, and toxic fumes are partially dissolved and washed away.

This reduces the risk of smoke and heat damage to high-quality HEPA filters.

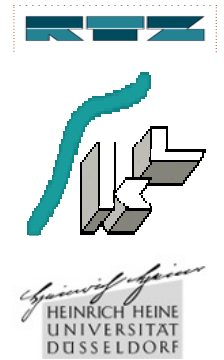
No excess atmospheric pressure is created, as is the case with conventional gas-extinguishing systems. And because the volume of water released is much smaller than with normal sprinkler systems, water retention and thermal or chemical neutralization are both less complicated and less expensive.

FOGTEC specializes in the planning and implementation of high-pressure water mist fire-extinguishing systems for laboratories.

Our engineers and service technicians are well versed in the regulations and requirements for biological agents and gene technology. They ensure the proper installation and operation of our systems is in compliance with all legal stipulations and professional guidelines.

Our engineers and service technicians are well versed in the regulations for biological agents and gene technology, and ensure proper, convenient implementation and maintenance in compliance with all legal requirements and guidelines.

Ongoing dialog with agencies such as ELATEC ensures that FOGTEC will remain a competent and reliable partner for the planning and implementation of special fire-protection solutions in laboratories. FOGTEC also provides maintenance services and operational assistance in keeping with the special requirements of our customers. **Our customers include:**



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