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Fraunhofer Institute for Solar
Energy Systems ISE

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ISE

Information to the Public Pursuant to Section 8a of the Major Accidents Ordinance (Störfallverordnung)

Research for the Energy Transition

What Is a Major Accident?

A major accident is an event that, immediately or later, within or outside the affected establishment, poses a serious threat to human health or life or to the environment. This can include a fire, an explosion, or a release of substances.

Why is ISE classified as a lower-tier establishment under the Major Accidents Ordinance (Störfallverordnung)?

To advance the energy transition with implementable technological solutions, Fraunhofer ISE conducts research and development in laboratory and pilot-scale facilities. In some cases, hazardous substances are used in this process.

For example, in the development of highly efficient solar cells, arsine and phosphine are needed to increase electrical conductivity. Hydrofluoric acid is used to clean or etch silicon wafers prior to their processing into solar cells.

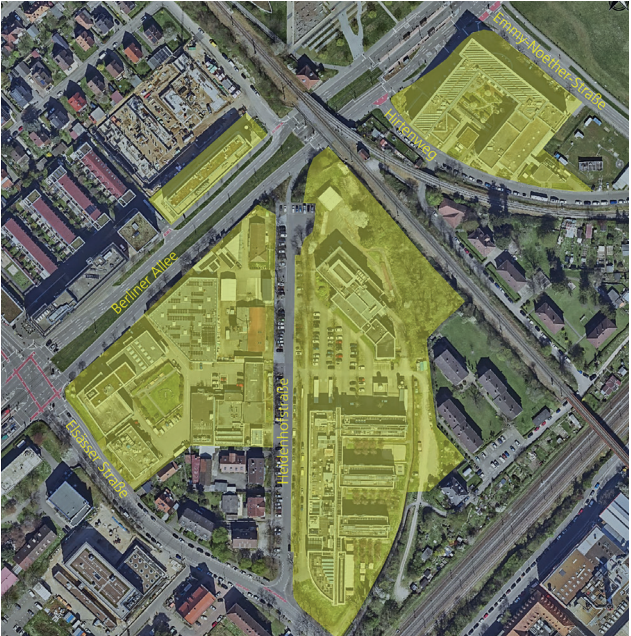
We use hydrogen for long-term energy storage and the development of novel, climate-friendly fuels. Our research covers hydrogen production from water electrolysis and its conversion to electricity in fuel cells. We also use hydrogen to manufacture chemical synthesis products for mobility and industrial processes.

Due to the hazardous substances present in some laboratories and technical facilities, Fraunhofer ISE is subject to the regulations of the Major Accidents Ordinance for lower-tier establishments. The establishment includes all properties at the Heidenhofstraße 2 site (see property map with color-coded areas). ISE submitted its notification pursuant to Section 7 of the Major Accidents Ordinance to the Freiburg Regional Council as the competent authority.

What hazardous substances are present at Fraunhofer ISE?

We conduct research and development using a variety of substances. Below is a selection of hazardous substances that are particularly relevant to the work at ISE:

Hazardous Substance	Pictogram	Hazard characteristics
Arsenic trihydride (arsine)		Extremely flammable gas
		Contains gas under pressure; may explode if heated
		Inhalation may be fatal
		May cause organ damage with prolonged or repeated exposure
		Very toxic to aquatic organisms with long-term effects
Phosphorus trihydride (phosphine)		Extremely flammable gas, may spontaneously ignite upon contact with air
		Contains gas under pressure, may explode if heated
		Inhalation may be fatal
		Causes severe skin burns and serious eye damage
		Very toxic to aquatic organisms
Hydrofluoric acid		Life-threatening if swallowed, in contact with skin, or if inhaled
		Causes severe skin burns and serious eye damage
Hydrogen		Extremely flammable gas
		Contains gas under pressure; may explode if heated



© Data source: City of Freiburg, www.freiburg.de Fraunhofer ISE properties surrounding the Heidenhofstraße 2 site. The establishment classified as lower-tier establishment under the Major Accidents Ordinance is highlighted in color.

What precautionary measures has Fraunhofer ISE taken?

To prevent accidents and limit their consequences, Fraunhofer ISE has a comprehensive safety management system in place. The measures include:

- Monitoring the compliance of all legal requirements
- Proper and safe storage and use of hazardous substances
- Regular and comprehensive training of specialized staff, such as laboratory supervisors, facility operators, and safety officers
- Involvement of external experts
- Protection of facilities through technical and structural design to prevent the release of hazardous substances
- Maintenance and inspections of facilities (including fume-hoods, ventilation systems, gas systems, gas detection-systems, and fire alarm systems) by experts within the time frames specified by law
- External on-call service outside regular working hours

How should you respond if an accident occurs in the vicinity?

- Seek shelter indoors.
- Close windows and doors.
- Turn off air conditioning and ventilation systems.
- Listen for announcements on the radio (Baden FM, Radio Regenbogen, SWR 4), on TV (SWR), and via the “NINA” alert app.
- Call the police and fire department only in an emergency to keep phone lines clear.
- Follow the instructions of emergency responders.
- Wait for the all-clear from emergency responders via radio or loudspeaker announcements.

Fraunhofer ISE

Through its research, the Fraunhofer Institute for Solar Energy-Systems ISE makes a significant contribution to a sustainable, economical, safe, and socially equitable energy supply worldwide. As one of the world’s largest solar research institutes, Fraunhofer ISE is driving the energy transition forward with practical, implementable technological solutions. To this end, approximately 1,300 employees work across four key areas: energy supply, energy distribution, energy storage, and energy utilization. In its business areas—Photovoltaics: Materials, Cells, and Modules; Photovoltaics: Production Technology and Transfer; Solar Power Plants and Integrated Photovoltaics; Power Electronics and Power Grids; Electrical Energy Storage; Climate-Neutral Heating and Buildings; Hydrogen Technologies; and System Integration—the institute develops materials, components, systems, and processes. It also conducts analyses, studies, and provides consulting services.

Fraunhofer ISE’s state-of-the-art R&D infrastructure enables cutting-edge research at the international level. In its laboratories accredited according to DIN EN ISO/IEC 17025, Fraunhofer ISE offers customized testing and certification services.

Further information:

- Occupational Safety Officer Fraunhofer ISE: Christian Schleifer; Tel. 0761-4588-2115; christian.schleifer@ise.fraunhofer.de; Website (date of last site visit): ise.link/major-accidents-ordinance
- Freiburg Regional Council (Regierungspräsidium Freiburg): Tel. 0761 208-0; referat54.1@rpf.bwl.de; Website (inspection plan): <https://www.lubw.baden-wuerttemberg.de/betrieblicher-umweltschutz/uberwachungssystem>

Fraunhofer Institute for Solar
Energy Systems ISE
Heidenhofstr. 2
79110 Freiburg
www.ise.fraunhofer.de/en

Institute Director
Prof. Dr. Andreas Bett
+49 761 4588-0