

# ***LITHIUM BATTERIES***

*NOT AS HARMLESS AS THEY SEEM*



» **Dangerous:** Unattended storing and charging of batteries

» **All-round protection:** ION-LINE safety storage cabinets for your safety

# Lithium-ion batteries

## EXPERTISE

## LITHIUM-ION BATTERIES

Frequent, sometimes weekly accidents and countless damages prove: **the unattended charging and storing of batteries, for example overnight, poses great risks and dangers.**

People admitted to hospitals with smoke inhalation and burns. High property damages of up to 500,000 €, leading to the financial ruin of companies and other organisations. These are the sad and distressing consequences of **improper storage and charging of batteries.**

**Lithium-ion batteries** pose major fire and eruption hazards. Damaged batteries can, under certain circumstances spontaneously ignite or become unstable and explode when heated.

According to the ADR\* **lithium-ion batteries are clearly classified as hazardous materials** and therefore must be handled appropriately.

Requirements for the storage of the hazardous materials by legislative bodies do not yet exist.

The fact that numerous insurance companies and associations, including the VdS Schadenverhütung GmbH (General Association of the German Insurance Industry), have included clear guidelines in their contracts, shows the acute need for action.

**According to German insurers and associations, batteries of medium capacity must spatially or structurally (in a fire-resistant manner) be separated from other areas.** Spatial separation by storing the defective batteries outdoors is only possible if there is a safety distance of 10 m surrounding the area.

\* ADR = „Accord européen relatif au transport international des marchandises dangereuses par route“, in english: „European Agreement concerning the International Carriage of Dangerous Goods by Road“

**In order to maintain the insurance cover, managing directors or their equivalent, must provide a suitable storage and charging solution for lithium-ion batteries. They are responsible for**

1. their employees and are obliged to comply with the Occupational Health and Safety Act.
2. They are also personally liable if inadequate fire protection measures are taken.

**This includes damage to property, possible damage to neighbouring facilities and, if necessary, the costs for large-scale evacuation measures. In addition, you must take the manufacturer's instructions for storage into account.**

With **the models of the asecos ION-LINE and a potential-free alarm contact** you fulfil the requirements of **insurers and associations**. The different models provide you with a secure storage and charging solution for your batteries that can be easily integrated into your premises – **no cost-intensive conversions are necessary!**

**Take action now and do not take unnecessary risks. Our experts will be happy to help you and carry out a risk assessment for your premises. Together we will find the right solution and achieve concrete results:**

- ✓ **Maintaining your insurance cover in the event of a fire**
- ✓ **Minimising the risk of damage to property and person**

**Your asecos experts can be reached via +49 6051 9220 0 or by sending an e-mail to [info@asecos.com](mailto:info@asecos.com)**







# Lithium-ion batteries

## LITHIUM-ION BATTERIES – NOT AS HARMLESS AS THEY SEEM

With the increasing use of lithium-ion batteries, the dangers related to storing and in particular charging these batteries increase in both commercial and private environments. Property insurers, therefore, are highly interested in ensuring available protective equipment (such as type 90 safety storage cabinets) are used to minimise risks and avoid damage claims.

**The recommendations of the property insurers, for example in Germany, for the use of safety cabinets are clear:**

"In order to effectively protect against damages from lithium batteries, there are certainly conventional **protective concepts** using classical measures that have **proven useful in manufacturing, handling and storing flammable materials.**"

Lithium batteries – fire hazards and safety risks  
Dr. Michael Buser, Dr. Jochen Mähliß

*"We tell customers to store batteries in hazardous goods storage cabinets."*

Underwriter for a German property insurer

"Areas with medium power batteries should be spatially (at least 5 m) or structurally separated from other areas with fire-resistant structures."

Publication VdS 3103 : 2019-06 (03)  
General Association of the German Insurance Industry  
published by VdS Schadenverhütung GmbH

**"Lithium batteries should generally be treated as a hazardous material."**

Publication VdS 3103 : 2019-06 (03)  
General Association of the German Insurance Industry  
published by VdS Schadenverhütung GmbH

"The VdS data sheet offers very good instructions for implementation here. No insurer will block it-self off or add more requirements than the VdS recommends."

German Insurance

"(...) it is generally recommended to only allow storage and handling of lithium batteries **in fire-resistant separate areas** or if an appropriate safety distance is ensured. Based on past damages, an international standard of **90 minutes fire resistance** (...) or a safety distance of at least 20 meters has proven effective here."

Lithium batteries – fire hazards and safety risks  
Dr. Michael Buser, Dr. Jochen Mähliß



## CURRENT NEWS



### 500,000 € in damages after an E-bike battery explodes

The sales floor of the northern German bicycle shop was quickly engulfed in flames.

The 4 floors of the parking structure over the store had to be evacuated quickly due to the extreme, hazardous smoke produced by the fire. Over 30 fire department vehicles and 70 fire fighters responded to the blaze.

Source: heise.de

### Electric car battery causes major fire in 2,000 m<sup>2</sup> commercial space

A lithium-ion battery exploded on a test track for E-bikes in the Netherlands.

The fire spread quickly and caused a huge plume of smoke in a very short time. Residents were cautioned to keep doors and windows closed. The fire department's response was severely curtailed due to the unpredictability of the battery. Their primary goal: To prevent the fire from spreading to neighbouring buildings. After allowing the commercial space to burn in a controlled manner, they delivered the devastating news: The building was unrecoverable and could not be saved.

Source: omroepgelderland.nl

### Lithium batteries – a hazardous material?

A lithium-ion battery – which was connected to a charger overnight – ignited a fire in the basement of a residential building in Lower Franconia.

The owner used the basement rooms for his online shop, where he sold a variety of batteries and offered repair services. The fire quickly created clouds of smoke and unpleasant, harmful odours. The defective batteries emitted harsh, aggressive acids, forcing the fire department, police, and residence to take extensive safety precautions.

Source: main-echo.de



## DAILY NEWS

### DAILY NEWS

#### Man dies of smoke inhalation after smartphone battery ignites

The Malaysian man was surprised by an exploding smartphone battery as he slept. The mobile device was beside his bed, and the explosion turned it into a fatal projectile. The man suffered a head wound which left him incapacitated. Unable to react, he suffered poisoning due to smoke inhalation and severe burns.

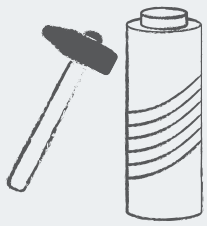

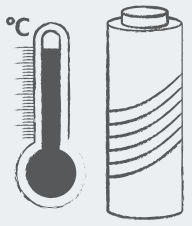
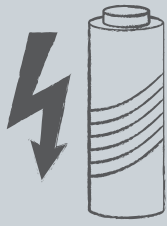
Source: n-tv.de



# Lithium-ion batteries

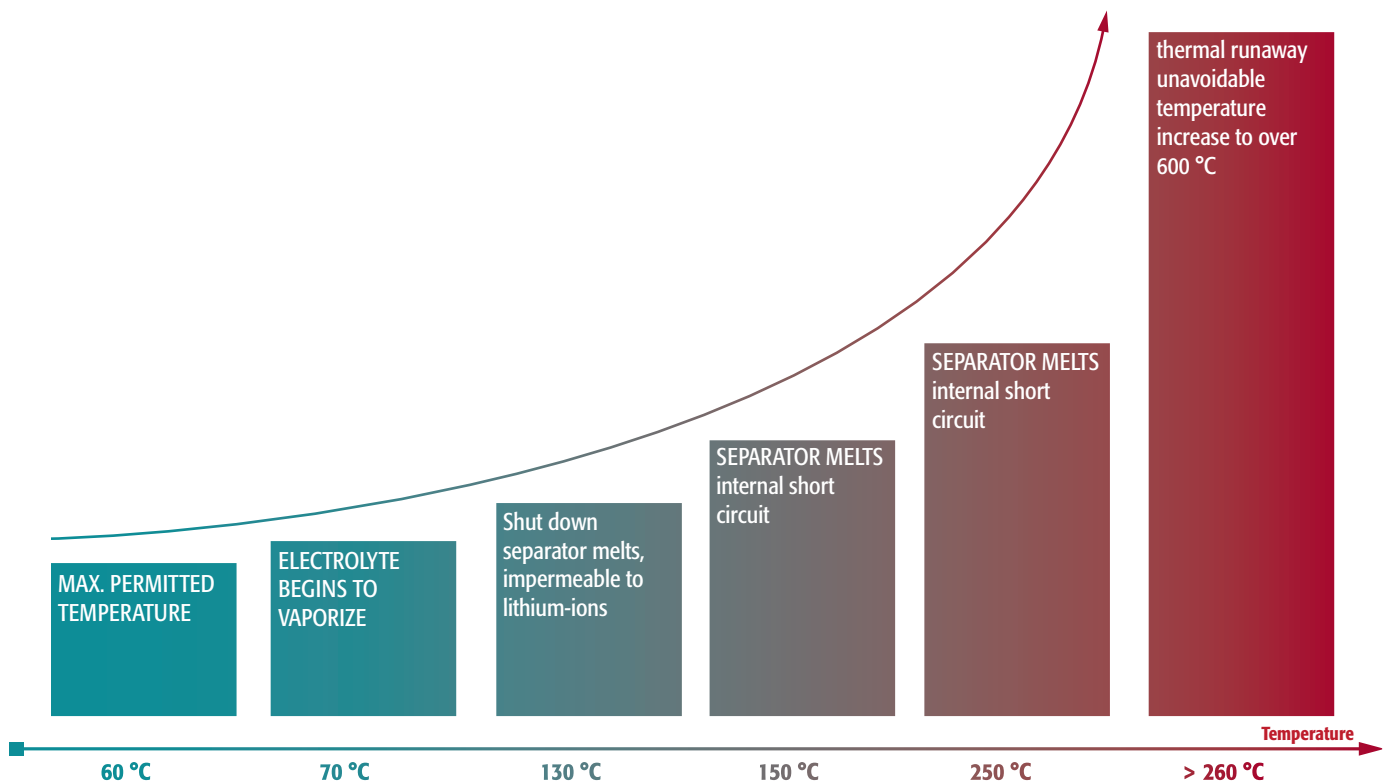
## THE HAZARDS — THE THERMAL RUNAWAY

Lithium-ion batteries can cause a fire. Causes include:

Mechanical damage	Deep discharge	Thermal overload	Electrical overload
In combination with the high energy density of the battery	Unstable cell	Caused by external heat or energy sources	During charging and discharging
			

In normal operation, using lithium batteries is considered safe. However, according to the VDE this is true only if they are handled properly. If there is a technical defect or a battery is damaged, the situation can quickly become critical. The German Insurance Association (GDV), therefore, requires that lithium batteries "generally be treated like a hazardous material".

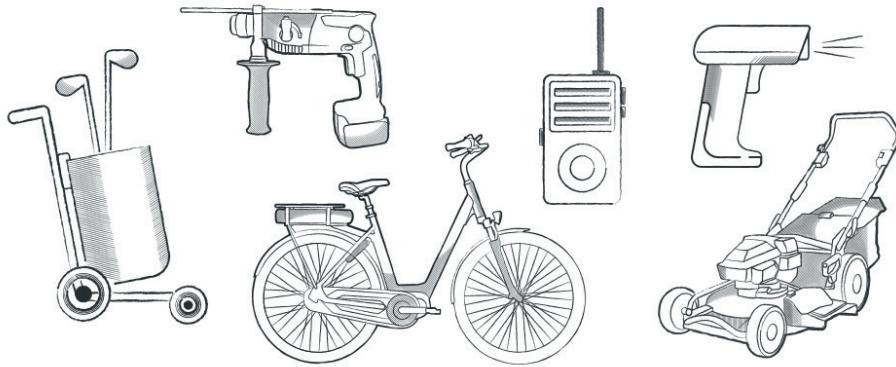
The situation becomes especially dangerous when a lithium battery discharges its stored energy in an uncontrolled manner. Once the heat produced exceeds the melting point of the lithium, this causes an unstoppable chain reaction, the "thermal runaway". The battery then burns up in an explosive manner. Such fires with lithium-ion batteries are difficult to manage, and the fire spreads quickly. Often, all the fire department can do is protect neighbouring areas.





# SAFETY REGULATIONS FOR MEDIUM POWER CLASS BATTERIES

according to VdS 3103:2019-06 (03)  
(Publication of German insurers for loss prevention)



## SAFETY REGULATIONS

- ▶ Compliance with manufacturer specifications (technical product data sheets)
- ▶ Protection against battery pole short circuits
- ▶ Protection against mechanical damages
- ▶ Do not expose to high temperatures or heat sources directly or for a long period of time (this includes direct sunlight)
- ▶ Compliance with structural or spatial separation (at least 2.5 m) from other flammable materials if no automatic extinguishing system is available
- ▶ Immediately remove damaged or defective batteries from storage and production areas (interim storage until disposal at a safe distance or in a separate fire-protected area)
- ▶ Exclusive storage of batteries with test certificate in accordance with UN 38.3 (prototypes only in exceptional cases and with risk assessment)
- ▶ Storage in separate fire-resistant areas or in compliance with a safety distance (spatial separation of 5 m)
- ▶ Avoidance of mixed storage with other products which are fire accelerants
- ▶ Monitoring the storage area with a suitable fire alarm system wired to a constantly occupied office
- ▶ If fire extinguishing systems are present: Compliance with information on suitable extinguishing agents in the technical product data sheets

## Conclusion

**Store and charge lithium-ion batteries  
in a safety storage cabinet!**



## THE CABINETS AND THEIR FEATURES.

For the safe active and passive storage of lithium batteries, the ascos ION-LINE offers three different safety levels:

**CORE:** Comprehensive fire protection with the proven ascos evacuation and alarm forwarding concept.

**PRO:** Enhanced protection for professional handling of lithium-ion batteries including 3-stage alarm and active fire suppression system.

**ULTRA:** Enhanced fire protection, active smoke management and extended monitoring providing safety to the highest level in sensitive areas.



**ION-ULTRA-90:**  
Available for pre-order from  
February 2024



	ULTRA	PRO CHARGE	PRO STORE
<i>Fire resistance from the outside</i>	✓	✓	✓
<i>Fire resistance from the inside</i>	✓	✓	✓
<i>GS certified fire resistance</i>	✓		
<i>Store</i>	✓	✓	✓
<i>Charge</i>	✓	✓	
<i>Evacuatable from site</i>	✓	✓	✓
<i>Smoke detector</i>	✓	✓	✓
<i>Potential-free alarm contact</i>	✓	✓	✓
<i>Temperature sensor</i>	✓	✓	✓
<i>Fire suppression system</i>	✓*	✓	✓
<i>Smoke-tight</i>	✓		
<i>Alarm differentiation</i>	✓	✓*	✓*
<i>Pressure relief opening in the head section</i>	✓	✓	✓
<i>Locker system</i>			

\*optional



No matter which security level you choose, the basic security features such as fire protection from inside to outside and outside to inside, smoke detection and alarm forwarding are offered by all cabinets in the CORE, PRO and ULTRA model lines.

With the CORE and PRO models, you also always have a choice: If you only want to **store** batteries in the cabinet, choose the **STORE variant**. If batteries are to be charged directly in the cabinet, choose the **CHARGE variant**.



CORE CHARGE	CORE STORE	CHARGE LOCKER	CHARGE UB
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
✓		✓	✓
✓	✓	✓	✓
✓	✓		✓
✓	✓	✓	✓
		✓	
✓	✓		
✓*		✓	

## THE ION-LINE SAFETY CONCEPT

INCIDENTS	Warning MESSAGE 1	ALARM LEVEL 1	ALARM LEVEL 2
	<ul style="list-style-type: none"> <li>Interior temperature &gt;50 °C</li> </ul> <p>Possible causes:</p> <ul style="list-style-type: none"> <li>Temperature build-up due to battery charging processes</li> <li>Ventilation system failure</li> </ul>	<ul style="list-style-type: none"> <li>Smoke detector detects incipient smoke development</li> </ul> <p>Possible reasons:</p> <ul style="list-style-type: none"> <li>Smoke detection without simultaneous temperature rise</li> </ul>	<ul style="list-style-type: none"> <li>Alarm level 1 has been triggered</li> <li>Interior temperature &gt;70 °C</li> </ul> <p>Possible reasons:</p> <ul style="list-style-type: none"> <li>Fire development</li> </ul>
SYSTEM REACTIONS	CORE	<ul style="list-style-type: none"> <li>Acoustic signalling with medium tone interval</li> <li>The potential-free switching contact forwards an alarm</li> </ul>	
	PRO	<ul style="list-style-type: none"> <li>The warning light (red LED) is activated and lights up permanently, the function indicator (green LED) goes out.</li> <li>Alarm triggers with slow sound interval</li> <li>The socket strips switch off</li> <li>The potential-free alarm contact forwards an alarm</li> </ul> <p>In the PRO CHARGE model</p> <ul style="list-style-type: none"> <li>Switching off the technical ventilation and power strips</li> </ul>	<ul style="list-style-type: none"> <li>The warning light (red LED) switches from steady light to flashing light</li> <li>The alarm switches to a fast sound interval</li> <li>The fire suppression system trips</li> </ul> <p>In the PRO CHARGE model</p> <ul style="list-style-type: none"> <li>Switching off the technical ventilation and power strips</li> </ul>
	ULTRA	<ul style="list-style-type: none"> <li>The function indicator flashes red</li> <li>Alarm triggers with rapid sound interval</li> <li>The ventilation flaps close</li> <li>The fan and the socket strips switch off.</li> <li>The potential-free alarm contact forwards an alarm</li> </ul>	<ul style="list-style-type: none"> <li>The function indicator flashes red</li> <li>Alarm triggers with rapid sound interval</li> <li>The ventilation flaps close</li> <li>The fan and the socket strips switch off</li> <li>The potential-free alarm contact forwards an alarm</li> <li>The optional fire suppression system trips</li> </ul>
SUBSEQUENT MEASURES	Internal qualified personnel can immediately inspect the system to take any further necessary measures. If the interior temperature decreases below 50 °C once again, the system returns to normal operations, and the visual and acoustic signals are turned off.	Technicians (such as from the fire department) can immediately inspect the system to take any further necessary measures. If the smoke detector does not detect any further smoke production inside the cabinet, the system can be returned to normal operations by briefly unplugging it from mains voltage.	The overall system can then only be assessed by an authorised ascos service technician and reset to normal operation if possible. At least the fire suppression unit and smoke detector must be exchanged before doing so.

### EXPERT TIP: React quickly in case of a fire

With an integrated 3-stage warning/ fire suppression system and smoke detector, the cabinets offer a high level of safety for storing and charging lithium-ion batteries.

Any fires which occur inside the cabinet are detected promptly, and employees can be evacuated immediately. The warning/fire suppression system is also connected to a permanently staffed building management service, ensuring that trained rescue personnel...

- can be alerted and be on site in a short space of time.
- can initiate further measures immediately after completing an initial assessment of the situation.
- can remove the cabinet from the building, if desired. This prevents further major damage to the building, and protects against personal injury.

The cabinets are equipped with a transport base to ensure fast transportation. Cabinets are automatically unplugged from mains supply during transportation. Once the cabinet is outside of the building at a safe location, rescue personnel can identify any further measures necessary.

**We recommend an installation at the ground level for the simplified and quick evacuation of the safety storage cabinets!**



# ALARM FORWARDING

## AS KEY COMPONENT

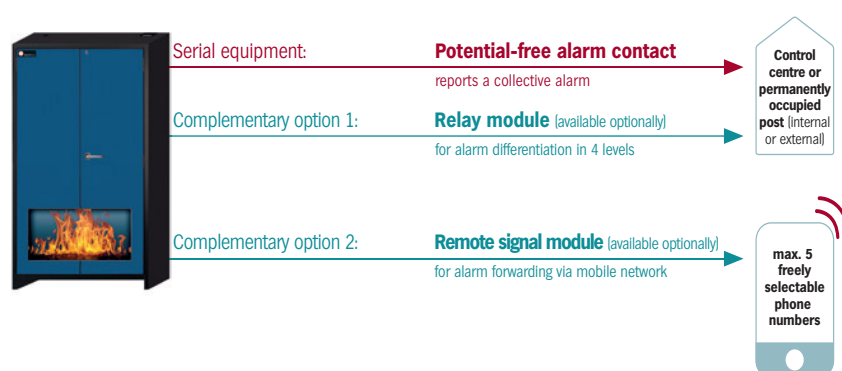
Whenever the cabinet is unattended, especially at night or on weekends, alarm forwarding is indispensable in an emergency. It is the only way to quickly detect the damage and initiate countermeasures.

### Manufacturer's recommendation & serial equipment:

#### POTENTIAL-FREE ALARM CONTACT

All ION-LINE cabinets are equipped ex works with a potential-free alarm contact for on-site alarm forwarding. The connection of this contact to a permanently occupied control centre (internal or external) has to be preferred as the most reliable way of alarm forwarding. Optional modules can be purchased as an alternative or extension.

### Alarm forwarding – These are your options:



#### Complementary option 1:

##### RELAY MODULE

By choosing this option, you are opting for alarm differentiation instead of a collective alarm.

The factory-installed module differentiates between four different warning and alarm levels:

1. warning message at a temperature above 50 °C inside the cabinet
2. alarm level 1 (see page 10)
3. alarm level 2 (see page 10)
4. power failure

Via potential-free alarm contacts, these signals are passed on to a central control centre. With the clear differentiation of the alarm conditions, you can initiate optimally coordinated measures.

**The relay module is suited for the PRO models of the ION-LINE.**

#### Complementary option 2:

##### MODULE FOR REMOTE SIGNALLING

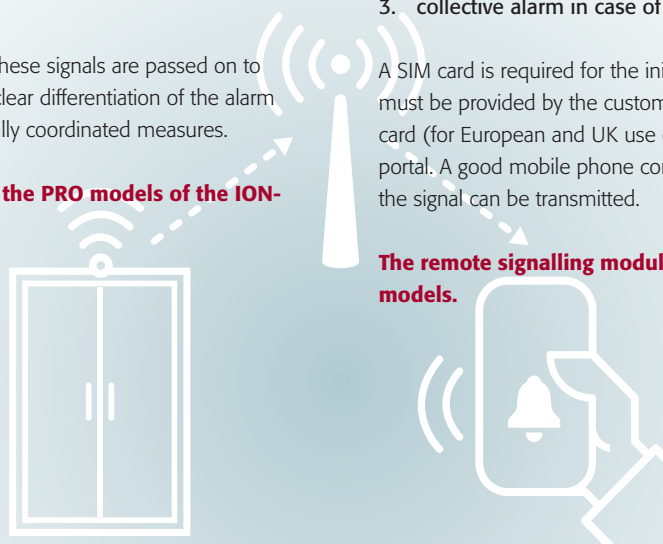
The module offers an alarm forwarding via the mobile phone network (SMS/call) and is therefore especially suitable for companies and facilities without a central building management system. In an emergency, the immediate alerting of one or several defined persons is triggered.

The module is easily installed on-site by the customer via plug (also suitable for retrofitting) and offers the following functions:

1. five programmable telephone numbers
2. configurable message texts
3. collective alarm in case of an emergency or power failure

A SIM card is required for the initial operation of the module, which must be provided by the customer. Alternatively, the included SIM card (for European and UK use only) can be activated via an online portal. A good mobile phone connection is necessary to ensure that the signal can be transmitted.

**The remote signalling module is suited for all ION-LINE models.**



# Overview of all safety cabinets

## Contact us for your individual cabinet solution

Your asecos experts can be reached via +49 6051 9220-0 or by sending an e-mail to [info@asecos.com](mailto:info@asecos.com)







# www.asecos.global

## TERMS AND CONDITIONS

### Dimensions, weights and illustrations

Technical data such as dimensions and weights shown in the catalogue are approximate values. Illustrations may contain special equipment. Products will be delivered without any decoration material.

### Price and delivery information

To obtain binding price information and delivery times, please contact your respective dealer/retail partner.

### Customs duty / documents dispatch

In case any country-specific extra costs occur for an order (like for example customs confirmation, express shipping of documents, chamber of commerce (IHK) confirmations, etc.), the charges will be passed on accordingly.

### Other information

Furthermore we refer to the general terms and conditions of the asecos GmbH on **www.asecos.global** and the terms and conditions of your specialised dealer.

#### asecos GmbH

Sicherheit und Umweltschutz  
Weierfeldsiedlung 16-18  
DE-63584 Gründau

☎ +49 6051 92200  
☎ +49 6051 922010  
✉ info@asecos.com

#### Asecos BV

Veiligheid en milieubescherming  
Christiaan Huygensweg 4  
NL-2408 AJ Alphen a/d Rijn

☎ +31 172 506476  
☎ +31 172 506541  
✉ info@asecos.nl

#### asecos SARL

Sécurité et protection de l'environnement  
7 rue du Pré Chaudron  
FR-57070 Metz

☎ +33 3 87 78 62 80  
✉ info@asecos.fr

#### asecos S.L.

Seguridad y Protección del  
Medio Ambiente  
C/ Calderí, s/n – Ed. CIM Vallés, planta 7,  
oficinas 75-77  
ES-08130 – Santa Perpètua de Mogoda  
Barcelona

☎ +34 935 745911  
☎ +34 935 745912  
✉ info@asecos.es

#### asecos Ltd.

Safety and Environmental Protection  
Profile House  
Stores Road  
Derby, Derbyshire  
DE21 4BD

☎ +44 1332 415933  
✉ info@asecos.co.uk

#### asecos

Safety and Environmental Protection Inc.  
c/o Schumann Burghart LLP  
1500 Broadway, Suite 1902  
NYC 10036, New York, USA

☎ +1 727 251 9491  
☎ +49 6051 922010  
✉ info@asecos.com

#### asecos Schweiz AG

Sicherheit und Umweltschutz  
Gewerbe Brunnmatt 5  
CH-6264 Pfaffnau

☎ +41 62 754 04 57  
☎ +41 62 754 04 58  
✉ info@asecos.ch

#### asecos AB

Säkerhet och miljöskydd  
Skyttelgatan 23  
753 42 Uppsala

☎ +46 18 34 95 55  
✉ info@asecos.se