EXTINGUISHING WITH GLASS

MINERAL-BASED FIRE EXTINGUISHING AGENT FOR CLASS D FIRES AND LITHIUM-BATTERIES

Extover® is a new and environmentally friendly extinguishing agent from expanded glass granulate. It can be used for fire extinguishing and preventive fire protection. The small, lightweight spheres consist of foamed recycled glass with tiny pores on the inside, forming a closed cell structure. Since the granulate is 100% mineral based, it is not combustible.

ADVANTAGES
- Purely mineral, 100% glass
- Causes no extinguishing water damage
- Multifunctional (extinguisher, absorbent, filtration medium)
- Can be used with other extinguishing agents
- Reusable
- Environmentally friendly and harmless to health
- Maintenance-free
- Easy handling as bulk material
- Very free-flowing
- Buoyant
- Recyclable
- Sustainable, because made of post-consumer recycled glass
- Suitable for the use in class D fire extinguishers

The Material Testing Institute MPA Dresden has tested and certified Extover® as a fire extinguishing agent according to DIN EN 3-7:2007 standard. Fire extinguishing tests were conducted on sodium and magnesium fires. Additional fire extinguishing tests were also made on lithium-primary and lithium-ion batteries. All of the tested fire objects were successfully extinguished with Extover®.

The sorbency capacity of the Extover® granulate was tested by the Federal Institute for Materials Research and Testing (BAM) in Berlin. This test was conducted based on the BS 7959-1:2004 standard ("Materials used for the control of liquid spillages – Part 1: Determination of sorbency"). The Extover® granulate absorbs about 200% of its own weight in water and/or liquid chemicals.

For more information, info sheets, photos or videos please visit our website.

Application example
Extover® granules used as fire protection filling in a portable special container for example to extinguish magnesium flares in soccer stadiums.

Extover® ensures a controlled combustion of the magnesium flare and forms a dense cocoon of glass around the flame.

WWW.EXTOVER.COM

Multicellular expanded granules with a closed pore structure.

Extover® does not cause water damage, is reusable and was tested by the Material Testing Institute (MPA) Dresden. Even problematic fire loads such as metal fires and lithium battery fires can be controlled and extinguished using Extover®.

The Extover® beads are manufactured using a special self-developed process. The recycling glass is finely ground, mixed and formed to granules. After this the raw grain is getting sintered and foamed (expanded) in the rotary kiln to create lightweight and stable spheres with a fine closed cellular pore structure.

12/2018

Our raw material: glass cullet

The final product: Extover® beads

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Distributor North America:
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info@poraver.com
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SUITABLE FOR CLASS D (METALL) FIRES AND LITHIUM BATTERIES

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THE EXTINGUISHING EFFECT AND FUNCTION OF EXTOVER®

Fuel, oxygen and heat are the fundamental requirements for a fire to burn. All three factors must be present in the right proportions. A catalyst can promote combustion while an inhibitor retards a fire. All fire fighting methods are based on eliminating one or more fundamental requirements for a fire.

EXTOVER® IS MULTIFUNCTIONAL

- **Displaces oxygen and suffocates the fire**
- **Prevents re-flaming**
- **No extinguishing water damage**
- **Absorbs thermal energy and prevents it from expanding**
- **Vapor and fumes accumulate on the grain surface and are bound for disposal**
- **Absorbing fluids (eg electrolyte)**

By covering the fire load with Extover®, oxygen is suppressed and separated from the combustible material. Extover® melts like glass after a certain temperature. In the process, the granules absorb a lot of heat in the form of melting energy, thus cooling off the fire, and at the same time forming an impermeable shell around the fire load. This effectively prevents a reaction with oxygen.

The special granulate mixture combined with the porous and therefore especially large grain surface effectively binds liquids. Just like liquids, gases and vapours accumulate on the extremely large surface of the Extover® granulate and are bound for disposal.

**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>NEW Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grain size</strong></td>
<td>[mm]</td>
<td>1-4</td>
</tr>
<tr>
<td><strong>Fire extinguishing agent class D</strong></td>
<td>MPA No. 20140494-1</td>
<td>fire extinguisher use ¹</td>
</tr>
<tr>
<td><strong>Fire rating class (DIN 4102-4)</strong></td>
<td>non combustible (A1)</td>
<td></td>
</tr>
<tr>
<td><strong>Dry loose bulk density</strong></td>
<td>[kg/m³]</td>
<td>220 ± 30</td>
</tr>
<tr>
<td></td>
<td>[lb/ft³]</td>
<td>14 ± 1.9</td>
</tr>
<tr>
<td><strong>Crushing resistance</strong></td>
<td>[N/mm²]</td>
<td>≥ 1.5</td>
</tr>
<tr>
<td></td>
<td>[PSI]</td>
<td>≥ 217</td>
</tr>
<tr>
<td><strong>Oversize</strong></td>
<td>[%]</td>
<td>≤ 10</td>
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<tr>
<td><strong>Undersize</strong></td>
<td>[%]</td>
<td>≤ 15</td>
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<tr>
<td><strong>pH value</strong></td>
<td></td>
<td>8-12</td>
</tr>
<tr>
<td><strong>Moisture content</strong></td>
<td>[%]</td>
<td>≤ 0.5</td>
</tr>
<tr>
<td><strong>Specific thermal capacity of glass</strong></td>
<td>[kJ/(kg K)]</td>
<td>0.6-0.8</td>
</tr>
<tr>
<td></td>
<td>[BTU/lb °F]</td>
<td>0.16-0.18</td>
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<tr>
<td><strong>Main component</strong></td>
<td></td>
<td>Silicon dioxide</td>
</tr>
<tr>
<td><strong>Porosity approx.</strong></td>
<td>[%]</td>
<td>85</td>
</tr>
</tbody>
</table>

¹ A separate test of the entire system must take place for use in metal fire extinguishers

² Values according to DIN V 18004 on request

The strength grades may vary within the tolerance range of bulk densities.

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The special granulate mixture combined with the porous and therefore especially large grain surface effectively binds liquids. Just like liquids, gases and vapours accumulate on the extremely large surface of the Extover® granulate and are bound for disposal.

Available in bags and big bags (FIBC). Extover® 0.1-0.3 mm can also be used in fire extinguishers.
A fire protection concept should be tailored precisely to the needs and local conditions. Hazards in production, transportation, storage, during operation or disposal and recycling are taken into account. Extover® as a multifunctional fire extinguishing agent offers a solution for numerous applications and avoids problems in regards the extinguishing effect as well as the protection of assets and the environment. In preventive fire protection or as an extinguishing agent, Extover® is suitable for class D and lithium battery fire loads. The reusable product effectively extinguishes fires without causing damage.

ALL-ROUND EXTINGUISHING AGENT

The granulate is very well suited for use in industrial facilities, production operations, data processing centres, archives, warehousing and transport. Since it is an electrical insulator, Extover® is also ideal for use in the energy storage and supply sector, for example in transformer station protection. Extover® has a low dust content, tolerates frost and is easily removable.

LITHIUM BATTERY FIRE PROTECTION

The increasing demand for battery cells also results in higher fire protection requirements during production, transportation, storage and the disposal or recycling of lithium batteries. Extover® is ideal as a dry extinguishing agent and especially well suited for processes where the use of extinguishing water or foam is not possible, for example the aging of lithium batteries.

PACKAGING OF DANGEROUS GOODS

On the road or by air freight – anyone shipping dangerous goods has to observe numerous regulations. Transporting damaged or defective lithium batteries is problematic and special measures are required. Extover® meets the fundamental requirements for fire protection filler. Accordingly it may be used for conforming special transport containers.

Pictures above: Example of a fireproof container for the transportation of damaged lithium batteries
PREVENTIVE FIRE PROTECTION WITH EXTOVER®

Preventive fire protection encompasses all steps taken in advance in order to counteract the outbreak and spread of fires, and to limit their impact as far as possible. In technical fire protection, Extover® can be used as a fire suppression material for permanently filling cavities, cable shafts, lines and pipes. Filling suspended ceilings in residential and industrial construction would be another application possibility.

EXTOVER® AS A PACKAGING FILLER

Packaging fillers protect the packaged goods against damage, vibrations and impacts. The material should be lightweight and environmentally friendly in addition to binding liquids.

For shipping dangerous goods in the form of liquid substances, laboratory chemicals, bases, acids, paint thinner or similar, transportation in a dangerous goods carton or barrel with a non-combustible filler/binding agent to prevent leaks is prescribed. Extover® offers secure fire and leak protection for the packaging and transportation of dangerous substances. It is ideal as a packaging material for the bulk filling of outer packaging or for filling fireproof packaging cushions.

AREAS OF APPLICATION

- Light metal processing
- RC model building
- Transportation of dangerous goods (lithium batteries)
- Aviation and shipping (Cargo)
- Recycling companies
- Server rooms
- Telecommunication centers
- Museums
- Energy supply
- Production facilities

NEW

Extinguishing a gasoline-diesel-petroleum-mix with a metal fire extinguisher filled with Extover® 0.1-0.3 mm
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The glass is ground to powder to form the granules

The final product: Extover® beads

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