



PyroBubbles®

PyroBubbles® is a fire extinguishing agent tested by MPA Dresden GmbH, it complies with DIN EN 3 for European fire classification A (solids), B (liquids), D (metals) and F (fats and oils). The hollow glass granulate is assigned to construction material class A1. In fire prevention it is used for infilling or in fire safety panels. The product is lightweight, main component is silicon dioxide, grain sizes range between 0.5 and 5 mm.

The foamed micro hollow spheres may be used to extinct problematic fire loads like *Triethylaluminium (TEAL)* and *Silanes*, which can hardly be controlled by conventional fire extinguishing agents. Even Thermite fires can be enclosed safely by PyroBubbles®.

Extinction of metal fires

Metal fires rank notoriously to fire class D. Examples are magnesium, aluminium, sodium, potassium, lithium and many different alloys of them. The brilliant build quality and a low specific weight make e.g. magnesium particularly suitable as light metal in industry. Unfortunately magnesium has also some bad characteristics, instancing the metal is highly flammable in form of shaving or powder and additionally the firing temperature is about 3000 °C. Well known conventional ways to extinguish metal fires are with sand, salt or powder. Even there is a huge amount necessary to contain the spread of fire.

A large scale test with PyroBubbles®, took place at the german Federal Institute for Materials Research and Testing (BAM) in June 2011 (Picture A – D). In this test a 245 kg magnesium compound was smothered and controlled after 01:40 minutes and cooled in 50 minutes from about 2700 °C to about 500 °C. As a result the fire was completely extinguished. The **main extinguishing effect** is smothering. Thereby the supply of oxygen for the combustion process will be avoided and even large fire loads become controllable. Depending on the fireload the PyroBubbles® layer should be at least 20 cm to avoid reignition. Furthermore in the case of high temperatures the granulate melts and is transformed to an opaque layer. The layer totally isolates the fire (Picture D).

The **secondary extinguishing effect** is cooling. Caused by the high specific heat capacity the PyroBubbles® bulk can absorb large quantities of thermal energy. In case of metal fires with high temperatures, the energy will be consumed to melt the granules. PyroBubbles® can be applied manually or by mechanically. Further on we have developed a prototype of a mobile pressure transport device.



Picture A: TV station RBB with camera crew



Picture B: 120 invitee from different societies and companies



Bild C: 245 kg burning magnesium
(BAM, Sperenberg, Germany)



Picture D: Opaque layer

Conclusion

With PyroBubbles® as extinguishing agent, it's possible to control heavy fire loads like magnesium with a high propagation velocity. The fire will be manageable and finally easy to extinguish. If you have any further questions, please do not hesitate to contact us. Our staff is looking forward to a personal dialogue.

References, e.g.

- BATREC AG (Switzerland)
- ECKART Effect Pigments GmbH
- Magnesium Solutions Europe GmbH
 - Tecnalia (Spain)
 - Fire Brigade Switzerland
- Volkswagen foundry (Kassel)