Expandable graphite: a graphite modification with great potential for high end applications
Expandable graphite

• What is expandable graphite?

• Production of expandable graphite and variations of product parameters

• What are the main producing countries?

• In which applications can expandable graphite be used?
Expandable graphite production

$\text{H}_2\text{SO}_4 \rightleftharpoons$

$C = 0.67 \text{ nm}$
Expandable graphite production

Acid (z.B. H₂SO₄)

Flake graphite

Oxidising agent (e.g. KMnO₄ or H₂O₂)
Expandable graphite production
Expandable graphite production

Repeated washing

Drying

expandable graphite
Expandable graphite production
Expandable graphite: Expansion effect

\[ \sim 200 \, ^\circ C \]
Expandable Graphite – adjusting screws

- composition
- particle size
- pH-value
- purity
- rate of expansion
- starting temperature
Expandable graphite production
Expandable graphite production in China

Production qty per year: about 30,000 mt

17,000 mt export

10,000 mt local foil producers

Others: local sales in China
Applications

Graphite foil / gaskets
Foundry fluxes
Conductive additive
Production of Graphene
Expandable graphite: Use as Flame Retardant

Source: http://www.flameretardants-online.com/
Expandable graphite: Use as Flame Retardant

In the event of a fire:

- creates an instumescent layer
- stops resp. slows down flame spread
- reduces smoke emission, no halogen vapor
- acts highly efficient at small addition ratio
- can easily be mixed into a variety of formulations
Applications: Intumescent Flame Retardant

- PU-foam (furniture, construction, automotive)
- Textiles
- Polymer compound
- Rubber products
- Roof cover foils
- Intumescent coatings
Global Consumption of Flame Retardants in Plastics by Type 2011:

Total: 2 million tons a year

Source: http://www.flameretardants-online.com
Applications **fire protection collar**

Sealings for pipe and cable breakthroughs

Fire safety doors
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Thank You