GRAFGUARD® Fire Retardant Additive

GRAFGUARD® is free of chromic acid or any hazardous materials

GRAFGUARD® Fire Retardant Additive is a intumescent fire retardant engineered flakes that expands up to 500%, starting at the ***designated onset temperatures***. It has significant expansion force usable with rigid system such as cured phenolic.
It produces a non-flammable graphite char in a fire to slow down the fire from spreading.

Features compound of between Expandable Graphite Flake Planes are: a) oxidants open up the crystal b) intercalant penetrate crystal layers c) produce no toxic components or by-products.

Application:

- Flame Retardant building materials such as internal wall-partitions, external building claddings and coatings.
- Flame Retardant polymers.

ChemicalWatch
GLOBAL RISK & REGULATION NEWS

European Commission implements HBCD ban

3 March 2016 / Europe, Priority substances

The European Commission has amended its Regulation on persistent organic pollutants (POPs), to ban hexabromocyclododecane (HBCD).

This substance, also known as HBCDD, will now be listed in Annex 1 of Regulation (EC) No 850/2004. This prohibits its production, use, import and export.

Concentrations of HBCD equal to, or below, 100mg/kg (0.01 % by weight), when in substances, preparations, articles, or which are constituents of the flame-retarded parts of articles, are subject to Commission review by 22 March 2019.

The amendment includes several specific exemptions on intermediate usage. These relate to use of the substance in expanded and extruded polystyrene articles.

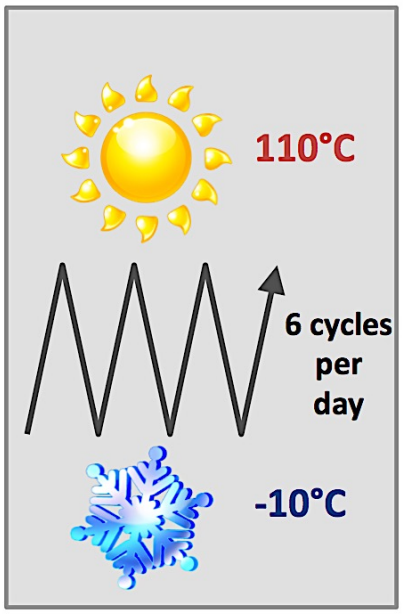
GRAFGUARD® Fire Retardant Additive

- **Intumescent fire-retardant additive**
  - **Significant expansion force**
    - Usable in rigid systems including those with cured phenolic resin.
  - Engineered flake that expands up to 500%, starting at **designated onset temperatures**.
  - Produces **non-flammable** graphite char.
  - Demonstrated to perform well when combined with other flame types.

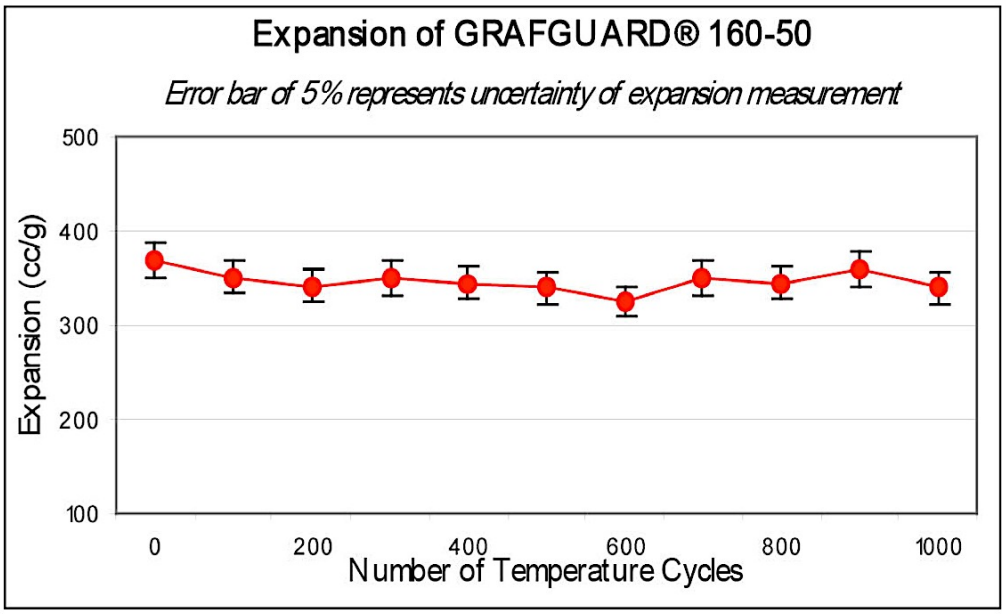
- **Environmental Benefits**
  - **PBT-Free Material** (Persistent, Bio-Accumulative, and Toxic)
  - Enabler for compliance (examples):
    - **BS EN 1021-2: EU Standard**
    - **Automotive FMVSS 302**
    - **California TB117** (legal action filed for reinstatement)
    - **REACH registered and approved**

GRAFGUARD® Reliability Test

Test Conditions

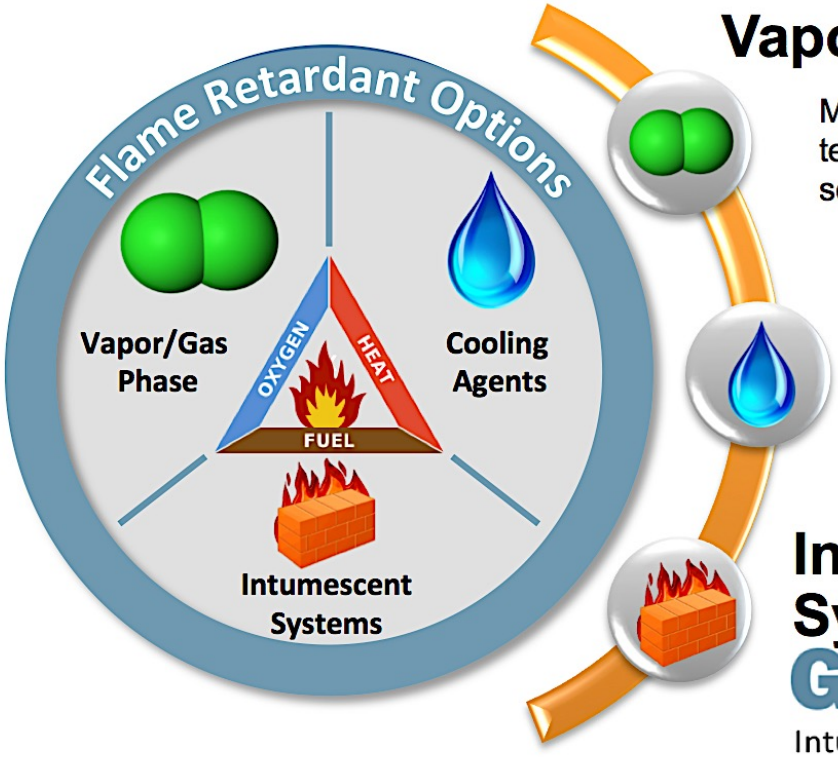


Results



Indefinite shelf life; Not affected by temperature cycles

Fire Retardant Materials



Vapor/Gas Phase

Materials that decompose at elevated temperatures and release water and/or scavenge oxygen.

Cooling Agents

Materials that decompose at elevated temperatures while absorbing heat and release water.

Intumescent Systems

GRAFGUARD®

Intumescent Fire Retardant Additive

Clays & Nanoparticles

Flame Retardant Mater is a Global Topic

- US Regulations
- EU Regulations
- Import/Export Rules

How to do it <u>safely</u> is the current market challenge

GrafGuard Nomenclature – GG 160-50N

On-set temperature °C- Particle Size Surface Chemistry

Grades of GrafGuard

Small Particle Size	Medium Particle Size	Large Particle Size
GG 200-100N	GG 160-80N	GG 160-50N
GG 210-140N	GG 220-80N	GG 220-50N
	GG 220-80B	GG 250-50N
		GG 180-60N