



Thor Group Performance Chemicals Product Portfolio

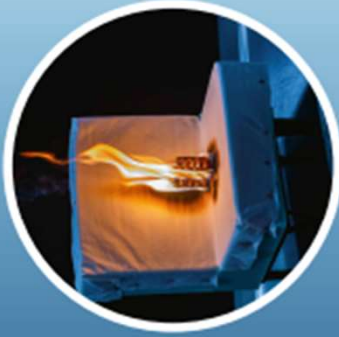
THOR

AFLAMMIT®

Halogen-free Flame Retardants

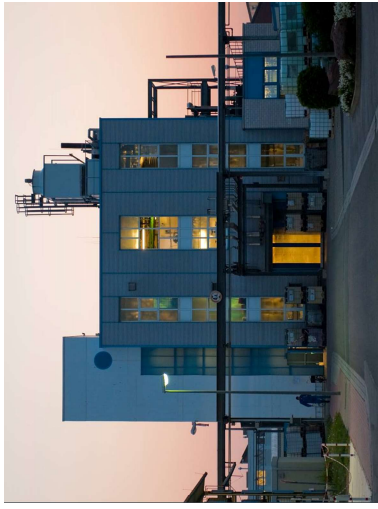
High performance products with matching R&D and Tech Service for:

- Paints, Coatings & Adhesives
- Textiles & Nonwovens
- Wood & Paper
- Plastics



www.thor.com

Australia • Brazil • China • France •
Germany • Italy • Japan • Malaysia •
Mexico • South Africa • Spain • UK • USA



Thor GmbH
Landwehrstraße 1
67346 Speyer

Mail: info@thor.com
Tel.: 06232 – 636 0
www.thor.com/de

Innovative Flame Retardants for various applications and challenges....

THOR

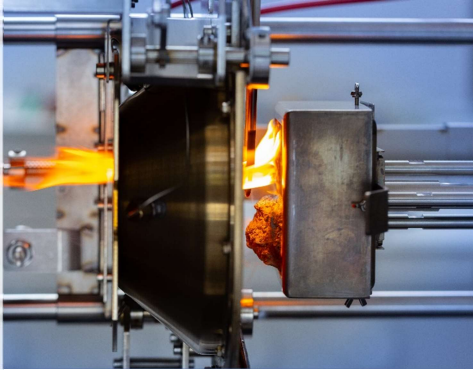
Textile Coating



Textile Impregnation



Intumescent



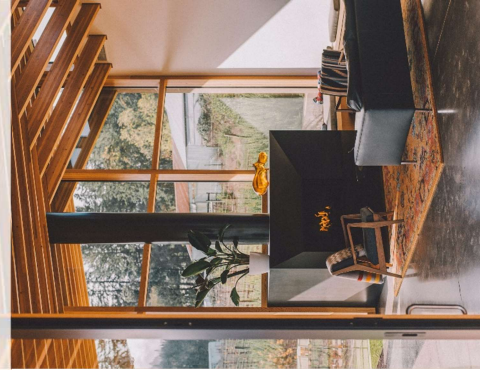
Thermoplastic



Thermoset & Coating



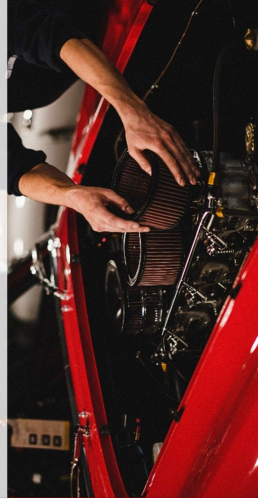
Wood



Leather



Paper



<https://www.thor.com/flame-retardants.html>



Flame Retardant Product Portfolio per Application

Textile Coating



| Product | Description | Application |
|--|---|---|
| AFLAMMIT® TLC 1556 | Thermoplastic polymer dispersion, Antimony and halogen-free | Stable foam coatings, Recommended for black-outs and dim-outs, Soft handle |
| AFLAMMIT® TSP | Thermoplastic polymer dispersion with phosphorus and nitrogen compounds | Coating of all types of fabric, Recommended for stretched ceilings, Can be printed, Medium handle |
| AFLAMMIT® CNE | Self cross-linking polymer dispersion with antimony trioxide and halogen | Coating for all types of fabric, Back coating of furniture fabrics, Soft handle |
| AFLAMMIT® NAH 2 | Aqueous dispersion based on inorganic phosphorus compound | Main use: Cellulosic materials, Applicable pure or in combination with binders, Nearly all coating and impregnation systems can be used |
| AFLAMMIT® TLC 1573 & 1575/6 | Thermoplastic polymer dispersions, Antimony and halogen free | Coating compounds, Recommended for carpets in public buildings and transportation, Soft to hard handle |
| AFLAMMIT® TL 1025 | Aqueous dispersion of antimony trioxide and halogen | Additives for binder systems |
| AFLAMMIT® TLC 1050 range | Thermoplastic polymer dispersion with antimony trioxide and halogen | Stable foam coating, Recommended for blackout fabrics, Medium handle |

Flame Retardant Product Portfolio per Application

| Textile Impregnation I | | | THOR |
|-------------------------------|---|--|------|
| Product | Description | Application | |
| Durable Flame Retardants | | | |
| AFLAMMIT® ZR | Potassium hexafluorozirconate, white powder | Potassium hexafluorozirconate | |
| AFLAMMIT® ZAL | Zirconium acetate solution | Used in combination with AFLAMMIT® ZR for low smoke emission | |
| AFLAMMIT® SAP / STW / TL 1127 | Aqueous organic phosphorus nitrogen compound | Durable FR treatment for cotton or cotton/synthetic blend workwear, Special processing: Ammonia gassing, Partly OEKO-TEX® suited (I-IV) | |
| AFLAMMIT® KWB | Liquid, reactive organic phosphorous compound | Cellulosic fibres, Providing hot washing and dry cleaning resistance, OEKO-TEX® suited (I-IV) | |
| AFLAMMIT® PE CONC | Liquid organic phosphorous compound | Polyester fibres and polyester blends, Mild washing resistance after thermosol processing Miscible with water, OEKO-TEX® suited (I-IV) | |
| Semi-Durable Flame Retardants | | | |
| AFLAMMIT® FMB | Aqueous organic phosphorous nitrogen compound | Cellulosic and cotton fibres (blends), Semi-durable on cellulosic fibres, Complies with BS 5852 | |

Flame Retardant Product Portfolio per Application

| Textile Impregnation II | | | THOR |
|------------------------------|---|--|------|
| Product | Description | Application | |
| Non-Durable Flame Retardants | | | |
| AFLAMMIT® PCO 962 | Cellulosic and cotton fibres (blends), Semi-durable on cellulosic fibres, Complies with BS 5852 | Applicable on nearly all substrates, Partly water soluble, High efficient FR (Booster); OEKO-TEX® suited (IV) | |
| AFLAMMIT® ASN | Aqueous mixture of inorganic salts containing phosphorus and nitrogen | Natural fibres, Cellulosic fibres and wool, Approved to DIN 4102, Class B1 | |
| AFLAMMIT® MSG | Aqueous mixture of organic phosphorous and nitrogen compounds | Natural and synthetic fibres including challenging blends, Low yellowing, Very effective, Good compatibility, Approved to DIN 4102 Class B 1, OEKO-TEX® suited (I-IV) | |
| AFLAMMIT® KRE | Aqueous mixture of organic and inorganic phosphorus and nitrogen compounds | Cellulosic fibres and selected synthetic blends, Low hygroscopic handle, Approved to DIN 4102, Class B1, OEKO-TEX® suited (IV) | |
| AFLAMMIT® HM | Crystalline powder based on ammonium salts of inorganic acids | Cellulosic fibres, Approved to DIN 4102, Class B1 | |
| AFLAMMIT® BN | Aqueous mixture based on ammonium salts of inorganic acids | Cellulosic, nylon and polyester fibres and blends | |

Flame Retardant Product Portfolio per Application

Wood



| Product | Description | Application |
|----------------------|---|--|
| AFLAMMIT® ASN | Potassium hexafluorozirconate, White powder | Cellulosic and cotton fibres (blends), Semi-durable on cellulosic fibres, Complies with BS 5852 |
| AFLAMMIT® APF | Aqueous mixture of inorganic salts, Containing phosphorus and nitrogen | Natural fibres, cellulosic fibres and wool, Approved to DIN 4102, Class B1 |
| AFLAMMIT® MSG | Aqueous mixture of organic phosphorous and nitrogen compounds | Natural and synthetic fibres including challenging blends, Low yellowing, Very effective, Good compatibility, Approved to DIN 4102 Class B 1, OEKO-TEX® suited (I-IV) |

Paper



| Product | Description | Application |
|--------------------------|--|--|
| AFLAMMIT® KRE | Aqueous mixture of organic and inorganic phosphorous and nitrogen compounds | Cellulosic fibers and selected natural fiber blends, Low yellowing, Low hygroscopicity, Approved to DIN 4102, Class B 1, OEKO-TEX® suited (IV) |
| AFLAMMIT® MSG | Aqueous mixture of organic phosphorous and nitrogen compounds | Cellulosic fibers and selected, Particularly even challenging, natural fiber blends, Low yellowing, Very effective, Good compatibility, Approved to DIN 4102 Class B 1, OEKO-TEX® suited (I-IV) |
| AFLAMMIT® TL 1343 | Aqueous mixture of organic and inorganic phosphorous and nitrogen compounds | Cellulosic fibers and selected natural fiber blends, Semidurable after condensation (e.g. filter) |

Flame Retardant Product Portfolio per Application

Thermoplastic



| Product | Description | Application |
|---------------------------------|--|---|
| AFLAMMIT® PCO 900 series | Organic phosphorous compound, High phosphor content (~24%); Very fine, white powder | Outstanding FR performance, Allows filler-free systems, Melting point ~245°C, Suitable for processing up to ~270°C |
| AFLAMMIT® MB | AFLAMMIT PCO 900 containing masterbatches, Partly with synergist | Various polymer matrices available on request |
| AFLAMMIT® PPN 903 | Special intumescent systems (not based on ammonium polyphosphate); White powder | Polyolefins, Especially polypropylene, Excellent thermostability, Hydrolysis and acid resistance |
| AFLAMMIT® PPN 924 | Multi-component blend, Based on ammonium polyphosphate, Fine white powder | Polyolefines, TPE-V (crosslinked thermoplastic elastomer) |
| AFLAMMIT® PPN 967 | Multi-component blend, Based on ammonium polyphosphate, Fine white powder | Polyolefins, Thermoplastic elastomers, Stable up to 250°C-260°C |
| AFLAMMIT® PPN 978 | Multi-component blend, Based on ammonium polyphosphate, Fine white powder | Polypropylene (Polyolefins), Thermoplastic elastomers, Stable up to 250°C-260°C |

Flame Retardant Product Portfolio per Application

Thermoset & Coatings I



| Product | Description | Application |
|----------------------------------|--|---|
| AFLAMMIT® PCO 900 series | Organic phosphorous compound, High phosphor content (~24%), Very fine, white powder | Outstanding FR performance, Allows filler-free systems, Melting point ~245°C, Suitable for processing up to ~270°C |
| AFLAMMIT® PCI 202 | Ammonium Polyphosphate (Phase II), Fine, white free flowing powder | Component in a wide variety of FR applications, High phosphor and nitrogen content |
| AFLAMMIT® PCI 230 | Modified ammonium polyphosphate, Fine, white free flowing powder | Improved hydrolysis and thermostability, Low hygroscopy |
| AFLAMMIT® TLP 1627 / 1630 | Differently modified ammonium polyphosphate; fine, white free flowing powder | Improved hydrolysis and thermostability, Low hygroscopy |
| AFLAMMIT® PPN 904 | Multi-component blend, Based on ammonium polyphosphate, Fine, white free-flowing powder | Thermosets |
| AFLAMMIT® PPN 977 | Multi-component blend, Based on ammonium polyphosphate, Fine, white free-flowing powder | Polyurethane, Thermoplastic polyurethane |

Flame Retardant Product Portfolio per Application

| Thermoset & Coatings II | | | THOR |
|--------------------------|----------------------------------|--|------|
| Product | Description | Application | |
| AFLAMMIT® PLF 140 | Liquid, aliphatic phosphatester | Main use: Polyurethane, Very broad applicable, Very low emission, Water-miscible, Reactive (OH-groups), | |
| AFLAMMIT® PLF 160 | Liquid, aromatic phosphatester | Main use EP/UP resins, Coatings, PU, Easy to process, Low emission, Plasticizing effect | |
| AFLAMMIT® PLF 280 | Liquid, aromatic phosphatester | Main use: Styrenic polymers and blends (HPS, ABS, etc.), Low emission, Limited plasticizing effect, Excellent hydrolysis and thermal stability | |
| AFLAMMIT® PLF 710 | High viscous, cyclic phosphonate | Strong FR performance, Pre-heating up >40°C necessary for easier processing | |
| AFLAMMIT® PLF 822 | Liquid, low viscous, phosphonate | Main use rigid PU foams, Epoxy systems, Coatings, Plasticizing effect | |

Flame Retardant Product Portfolio per Application

| Intumescent Systems | | | THOR |
|--------------------------|---|--|------|
| Product | Description | Application | |
| AFLAMMIT® PPN 903 | Special intumescent systems (not based on ammonium polyphosphate), White powder | Polyolefin, especially Polypropylene, Excellent thermostability, hydrolysis and acid resistance | |
| AFLAMMIT® PPN 904 | Multi-component blend, Based on ammonium polyphosphate, Fine, white free-flowing powder | Thermosets | |
| AFLAMMIT® PPN 924 | Multi-component blend, Based on ammonium polyphosphate, Fine white powder | Polyolefin, TPE-V (crosslinked thermoplastic elastomer) | |
| AFLAMMIT® PPN 967 | Multi-component blend, Based on ammonium polyphosphate, Fine white powder | Polyolefins, thermoplastic elastomers, Stable up to 250°C-260°C | |
| AFLAMMIT® PPN 977 | Multi-component blend, Based on ammonium polyphosphate, Fine, white free-flowing powder | Polyurethane, Thermoplastic Polyurethane | |
| AFLAMMIT® PPN 978 | Multi-component blend, Based on ammonium polyphosphate, Fine white powder | Polypropylene (Polyolefins), Thermoplastic elastomers, Stable up to 250°C-260°C | |

Flame Retardant Product Portfolio per Application

| Additives for Intumescent Systems | | | THOR |
|-----------------------------------|--|---|------|
| Product | Description | Application | |
| AFLAMMIT® PCI 202 | Ammonium polyphosphate (Phase II), Fine, white, free flowing powder | Key component in various intumescent systems, High Phosphor and Nitrogen content | |
| AFLAMMIT® PMN 200 | Melamine polyphosphate, Fine, white, free flowing Powder | Low water solubility, Excellent thermal stability, Excellent synergist for phosphor based flame retardants | |
| AFLAMMIT® PMN 525 | Melamine cyanurate, Very fine, white powder | Low water solubility, excellent thermal stability, Excellent synergist for phosphor based flame retardants | |

| Leather | | | THOR |
|---------------|---|--|------|
| Product | Description | Application | |
| AFLAMMIT® BN | Aqueous mixture based on ammonium salts of inorganic acids | Leather finish, No washing or soaking resistance, Soluble in cold water | |
| AFLAMMIT® FMB | Aqueous organic phosphorous nitrogen compound | Leather finish, No washing or soaking resistance, Soluble in cold water | |