



Flame
Retardants



Lohtragon®

Crystallizing Solutions

Joint Product Developments for Targeted Fire Protection

Customized Flame Retardant Additives for Safer, Sustainable Systems

Meeting Fire Safety Challenges – Together: Flame retardants are critical for ensuring fire safety across industries such as construction, transportation, electronics, and polymers. With rising awareness of health and environmental concerns, today's demand focuses on **eco-friendly, halogen-free flame retardant additives** that ensure both safety and sustainability.

With our **Lohtragon® Flame Retardant (FR) Approach**, we focus on **joint product development**, working closely with our partners to create **tailor-made flame retardant solutions** based on our unique expertise in **high-purity metal salts** and **multifunctional additive design**.

Validated by Testing: Lohtragon® FR as Standalone System and Synergist

Performance You Can Trust: Our flame retardant additives have already been successfully tested in various systems. Lohtragon® FR products deliver advanced flame retardant solutions with exceptional adaptability and performance, ensuring safety across a variety of applications. Our expertise in metal salts and their multifunctional properties allow us to offer products that not only perform as standalone flame retardants but also as synergists.

Wood and Lohtragon® FR: Advanced Ignition Control & Reduced Flame Spread
Wood samples treated with a special type of [Lohtragon® B40](#) | based on Tripotassium Citrate 1-hydrate exhibited in vertical inflammation test of spruce wood sticks showed:

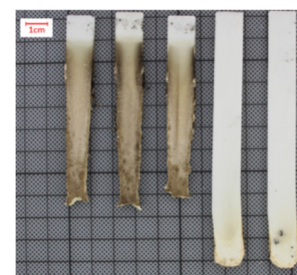
- ◆ Increased ignition resistance
- ◆ Reduced flame spread in vertical combustion tests
- ◆ Significant char formation, forming a protective barrier and reducing material damage.



Polymers and Lohtragon® FR: Reduced Flammability & Burning Times

We conducted flame retardant tests based on UL-94 in different polymer matrices:

- ◆ Polyamide (PA): a specially treated Lohtragon® Potassium Salt achieved the desired V0-rating, confirming excellent flame resistance
- ◆ Polyethylene (PE): Selected Lohtragon® Citrates effectively eliminated after-burning and altered fire behavior through rheological effects
- ◆ Polyester (PBT): Selected Lohtragon® Calcium and Magnesium Salts demonstrated strong flame retardant effects, improving thermal stability and mechanical properties.



Lohtragon® FR products can be adjusted in dosage and combination for different polymer systems.

Synergistic Effects of Lohtragon® FR: Charring, Smoke Suppression & Stability

Lohtragon® FR additives are ideal synergists for enhancing the performance of:

- ◆ Ammonium polyphosphate (APP)
- ◆ Mineral-based FR systems like aluminum and magnesium hydroxides
- ◆ Bio-based and sustainable polymer systems

Case Study: A specially formulated Lohtragon® synergist significantly improved the effect of magnesium hydroxide in polymers – achieving UL-94 V0-rating without compromising mechanical strength such as impact resistance or elongation.



Other Material Systems: Lohtragon® FR additives show promise in emerging applications such as:

- ◆ Aerogels
- ◆ Cellulosic fibers and textiles
- ◆ Foam systems

Initial tests are underway, and we welcome new collaborative testing projects tailored to your specific flame retardancy goals.

Joint Product Developments for Targeted Fire Protection

Summarizing Overview: The presented **case studies confirm that Lohtragon® FR Metal Salts provide targeted flame retardant effects across different matrices and applications both as standalone system and as synergist.** Each metal salt interacts differently depending on the material system, resulting in specific benefits such as improved char formation, reduced smoke generation, or enhanced thermal resistance. This underlines the adaptability and performance of Lohtragon® solutions in diverse flame retardant systems. Let us develop your individual Lohtragon® FR Additive based on your specific needs!

Why choosing Lohtragon® Flame Retardants (FR)?



Maximum Fire Protection with Tailored Additives

We customize Lohtragon® FR Additives to your system, ensuring optimal flame resistance, slower fire spread, and reduced smoke and gas for safer, more sustainable solutions.



Protecting People and the Environment

Our additives lower flammability, slow flame propagation, and reduce smoke and toxic emissions.



Proven, Compatible, and Synergistic

Halogen-free Lohtragon® FR Additives work reliably across polymers, wood, and textiles—both as stand-alone solutions and effective synergists. High fire protection at low concentrations preserves material properties and reduces production costs.



Sustainable, Eco-Friendly, and Future-Ready

Made from eco-friendly metal salts, our systems minimize environmental impact while meeting current and future fire safety regulations.

A Safer, Greener Future Starts Here: Choose Lohtragon® FR for your Formulations

Target modern fire protection challenges with Lohtragon® FR, offering **customized, effective, eco-friendly flame retardant additives.** Developed through joint product partnerships, these mineral-based solutions perform as stand-alone systems or synergists, enhancing flame resistance, reducing smoke and heat, and supporting char formation. **Application success in materials like wood, polyamides, and polyesters** underlines their versatility and **efficiency even at low concentrations.** With in-house testing and **collaborative development,** Lohtragon® FR systems are tailored to meet your fire safety goals, processing needs, and regulatory requirements.

Reach out to us and let us build your next outstanding flame retardant system together!

Joint Product Developments for Targeted Fire Protection

Lohtragon® Flame Retardant Additives – Safe Lives in a Safe Way

Common flame retardants are inorganic substances, halogenated organic products and organophosphorus compounds amongst others. A lot of these currently used products are under discussion because of health, safety and environmental (HSE) concerns.

In the mindset of offering innovative fire resistance solutions, the development phase of Lohtragon® flame retardant systems considers the aspects below. Based on high performance metals salts, this approach intends to meet the demanding challenges around fit for purpose. Regulatory constraints need to be anticipated, while considering sustainability aspects.

Flame retardant systems

- ◆ Single-product and synergist additives

Specific fire protection requirements

- ◆ Depending on application and final use
- ◆ Various test methods

Process suitability

- ◆ Free-flowing, reduction of dustiness
- ◆ Non-abrasive
- ◆ Non-corrosive

Product compatibility

- ◆ No non-desired interactions between components
- ◆ Surface modification, encapsulation, and others

Impact on other properties

- ◆ Interactions influencing mechanical and other properties (corrosion, migration, color, electrical, resistances, ...)

Regulatory affairs and compliance

- ◆ Product classification, REACH, environmental regulations, food contact, NIAS (Non Intentional Added Substances), ...

Anticipatory safety and risk considerations

- ◆ Product related
- ◆ Decomposition products during use
- ◆ Decomposition gases during fire

Life cycle assessment / sustainability

- ◆ Environmental impacts
- ◆ Recyclability and circular economy consideration
- ◆ Carbon footprint

Fire emissions of plastics

- ◆ Smoke density
- ◆ Toxic gases

Contact Us



+49 5155 63-5888



contact@lohtragon.com



www.lohtragon.com

Lohtragon® – A Brand of Dr. Paul Lohmann®

For over 135 years, the company Dr. Paul Lohmann has been able to establish and maintain its leading position as an international manufacturer of mineral and metal salts that meet the highest quality standards. The product range includes over 400 different salts, from Aluminum to Zinc, in a total of over 7,000 different specifications. Dr. Paul Lohmann® supplies its specialty salts worldwide to customers in the pharmaceutical industry, food sector, food supplements, cosmetics and – under the Lohtragon® brand – to customers in industrial applications.

Lohtragon® stands for unique competences in manufacturing, optimizing and developing metal salts for a broad variety of industrial market segments. Established in diversity, tailor-made for you, your application and your process - our solution for your challenges!

Established Products

By choosing Lohtragon® products, you benefit from direct manufacturer sourcing and our "Made in Germany" quality and reliability promise.

Joint Developments

From concept phase to tailored product optimization, we are your partner to solve any development challenge.

Expert Services

Rely on services from our application technology, regulatory affairs, logistics, quality departments and more. We fully support you in all areas.

The information given in the document corresponds to our current knowledge. We warrant in the frame of our General Terms and Conditions of Sale that our products are manufactured in accordance with the specifications. However, we disclaim any liability with regard to the suitability of our products for a particular purpose or application or their compatibility with other substances. Tests have to be performed by the customer who also bears the risk in this respect. Nothing herein shall be construed as a recommendation to use our products in conflict with third parties' rights.