Intumescent carbon donors

Win more time for people & structures

Perstorp

A winning technology

Intumescent systems offer halogen-free fire protection for people and property.

Today, the use of intumescent systems is growing thanks to their safe chemical profile in terms of handling and environment, as well as their efficient protection that meets stringent fire safety regulations.

Intumescent systems are ideal as protective coatings and sealants in the construction industry, for fire resistant plastics in electrical, electronics and transportation.

Intumescent systems work by forming a thick, stable carbon foam barrier when exposed to fire, and have three key components:

- CHARMOR™, THE CARBON SOURCE
- AN ACID DONOR SUCH AS APP (AMMONIUM POLYPHOSPHATE)
- A SPUMIFIC/BLOWING AGENT SUCH AS MELAMINE

In protective coatings, this char formation insulates steel structures, preventing early collapse. In expandable sealants, the char formation forms a fire stop and prevents gas and heat from spreading. In plastic and textile materials, intumescents slow combustion, cut heat and smoke release rates and reduce melt dripping.

THE RIGHT PRODUCT AT THE RIGHT TIME - WHEREVER YOUR ARE

Charmor™ polyols are a rich carbon source for producing superior intumescent systems. Our production of Charmor™ is carried out at our plant in Germany with excellent global supply capability. High product quality is assured by ISO 9001 procedures, and our precise milling technology for polyol micronization and quality control procedures ensure that at least 98% of our Charmor™ products are below the stated particle size values, 40 µm and 15 µm.

Having our own production facilities allows us to tightly control the total quality chain from sensitive raw materials, through manufacturing and milling, to bagging and distribution. This ensures the consistent high polyol purity and narrow particle size distribution that are essential to achieving high and consistent performance every time. The absence of coarse particles also ensure homogeneous chars without cracks and craters.

The non-toxic and easy to handle Charmor™ polyols are delivered as low density, white powder with strictly controlled particle size. They are available in varying composition and particle size. Charmor™ products are also non-hygroscopic and can be conveniently stored with virtually no caking.

Advantages include:

- Effective and reliable charring providing good insulation and longer protection time for people and building structures.
- Secure supply with the largest global production capacity & customized global supply service
- Light-weight and thinner coating solutions for aesthetics and reducing application costs
- Charmor™ Pro is made from renewable material & energy to reduce carbon footprint and differentiate your offer
- Reduced development cost and faster speed to market through collaboration, lab trials, IP support & R&D

Protects what matters

Intumescent coatings and expandable sealants based on Charmor™ protect buildings and the people inside them, in the event of fire. Charmor™-based coatings and sealants slow the spread of fire, reduce heat and minimize dangerous smoke and fumes more effectively than any alternative products, facilitating safe evacuation and limiting structural damage. The Charmor™ range ensures the ultimate performance and protection on surfaces including steel and wood.

For example, in buildings with structural steel profiles, which are increasingly common, the very high temperatures cause steel profiles to distort and become weaker, potentially leading to collapse. Steel loses its strength at about 500°C. Here, the extra time provided by Charmor™ compared to alternative products slows and even potentially prevents this process.

Charmor™ offers a rich carbon source that forms a thick fire-resistant char barrier when the intumescent coating is exposed to high temperatures. When a layer of Charmor™-based intumescent coating, circa one millimeter thick, is exposed to 200°C heat or higher, it will swell up 10 to 100 times its size to build a foam char barrier that insulates the underlying material.

And the high purity and consistency of Charmor™ improves the insulation effect of the intumescent coating and ultimately helps prevent the substrate from catching fire or distorting.

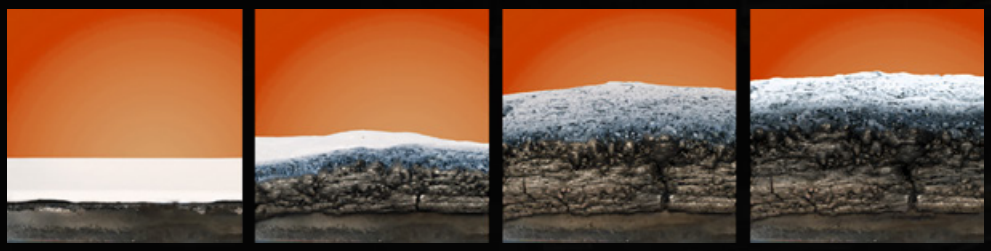
Charmor™ polyols are high performers. But to achieve reliable performance in intumescent formulations it is important to have high consistency regarding both chemical and physical properties. Minor changes in individual compounds contained in coatings can significantly influence end-product performance.

Coarse carbon donor particles can cause the inhomogeneous distribution of reactants, risking problems such as cracking and loss of adhesion during the intumescent process.

Fine-tuning particle size lets you customize the performance of an intumescent system with the precise structure of foam that best suits your application. For example, the standard grade Charmor™ PM40 creates foam with excellent swelling and robust properties for turbulent fire conditions. The finer particle size of Charmor™ PM15 creates foam with slightly higher volume and very good thermal insulation.

Derived from the Voxtar™ platform, the Charmor™ Pro PM40 offers the exact same high quality and technical properties as the standard Charmor™ PM40 but with a sharpened sustainability profile as it is partially produced from renewable raw material and with renewable energy.

The Charmor™ DP grade is the least water sensitive grade and is particularly suited for outdoor applications.



The intumescent reaction is activated by heat at approximately 200°C. It is an endothermic reaction that absorbs heat, emits inert gases and creates an effective insulation layer.

Thermoplastic resin melts to allow further chemical reactions to take place in a soft matrix.

Acid donor (ammonium polyphosphate) decomposes to form polyphosphoric acid.

Blowing agent* releases gases causing the ester to create a foam that form an insulating barrier which adheres to the substrate.

Polyphosphoric acid reacts with carbon donor (Charmor™) to form an inorganic/ organic ester.

The ester decomposes to form a tough carbon matrix

A sustainable alternative

Perstorp is fully committed to a sustainable future moving towards the goal of being completely finite material neutral.

Becoming Finite Material Neutral would mean switching to alternative resources that are abundant and/or renewable, or to close the loops in order to recycle or reuse those that are finite.

One step in this is to launch Pro-Environment Polyols. Versions of our well known high performing polyols in partly or fully bio-based form. Perstorp is using a concept based on a mass balance, supporting sustainable sourcing. Everything is controlled through a strict and well recognized certification system called ISCC.

For the Intumescent Carbon donors segment we now offer the following bio based products:

Charmor™ Pro PM40 C40	40%	Renewable
Charmor™ Pro DP40 C40	40%	Renewable
Charmor™ Pro PT40 C40	40%	Renewable


Pro-environment
choice
Charmor™ Pro
Intumescent carbon
donor from renewable
material & energy to
reduce carbon
footprint

One molecule can change everything

Perstorp believes in improving everyday life – making it safer, more convenient and more environmentally sound for billions of people all over the world. As a world leading specialty chemicals company, our innovations provide essential properties for products used every day and everywhere. You'll find us all the way from your car and mobile phone to towering wind turbines and the local dairy farm. Simply put, we work to make good products even better, with a clear sustainability agenda.

Founded in Sweden in 1881, Perstorp's focused innovation builds on more than 135 years of experience, representing a complete chain of solutions in organic chemistry, process technology and application development. Manufacturing is based in Asia, Europe and North America, with sales and support in all major markets. The Perstorp Group is controlled by funds managed and advised by the European private equity company PAI partners.

For more information, visit perstorp.com

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