



Pentaerythritol

Delivering security & efficiency

Our range of Penta products

- Enhances drying speed, hardness and water resistance of alkyd paints
- Ensures hydrolytic resistance and viscosity control of synthetic lubricants
- Secures low sensitivity to initiation and high explosive power of secondary explosives
- Provides effective derivatives for antioxidants for polyolefins and other plastics

The elements of success

You need a partner who can see the big picture when it comes to your products, your processes and your customers. Our experience and expertise in the special niches of organic chemistry, process technology and application development are at your service, providing you with a complete chain of solutions to enhance quality and profitability at every step.

Our versatile intermediates, an essential element of your winning formula, are specifically designed to add value and enhance end-product performance. Your solution to meeting the increasing demands for safer, lighter, more durable and environmentally friendly end-user products, begins here.

Innovation in everything we do

Innovation distinguishes every aspect of our business process. Developing smarter and safer solutions creates real value in new chemical applications. Focused innovation instills leadership and purpose in our business activities, improves internal processes and increases application and product competitiveness.

Delivering our promises globally

Our global presence provides you with reliable solutions and processes, consistent high quality, security of production and supply and delivery with precision. This commitment also means rapid response when product or application support is required and the very best in technical support.

Putting the care into chemicals

We take our responsibilities to heart and are committed to attentive, sustainable business practices. We minimize risks for our customers, our employees and the environment by working proactively to ensure safe products and processes.



Delivering security & efficiency

Perstorp Penta – your winning formula

When you choose Perstorp Pentaerythritol (Penta) you profit from the unique service and high quality that comes from partnership with the global leader and only truly global supplier of this essential raw material. The high purity and consistent quality of our Penta is ideal in strengthening your competitive advantage, minimizing production costs and maximizing performance and profit. We take Penta seriously and invest in every aspect of it.

Penta is a tetrafunctional compound of primary hydroxyl groups. The compact structure and the high density of hydroxyl groups provide outstanding properties. The main application area is as a branching monomer for alkyd resin, where it yields excellent balance between drying speed, viscosity and water resistance. It also enhances end-product performance in a wide range of applications such as alkyd-based coatings, synthetic lubricants, rosin esters, hot-melt adhesives, antioxidants and explosives.

Our Penta products:

Penta mono

a pure grade and our foremost product

Penta nitration

a mono grade with extra high purity and specific particle size distribution

Penta tech

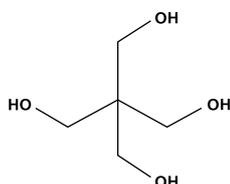
a product with higher, controlled level of Di-Penta

Penta mono micronized

Penta mono in micronized form

Penta tech micronized

Penta tech in micronized form



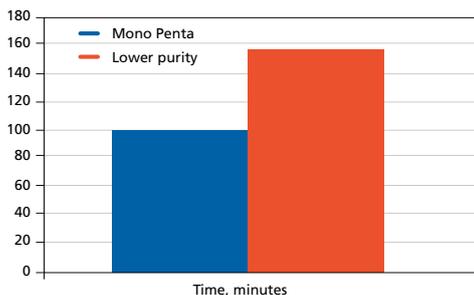
Designed to enhance

Added quality value

Through years of experience and expertise, we have developed unique production processes to secure the highest quality product and deliver it tailored to meet diverse end-user demands. The superiority of Perstorp Penta is documented and guarantees a fast, stable reaction process. Eliminate the risks associated with inferior products such as slower reaction time and jeopardized end-product quality.

Perstorp Penta has very high content of mono Pentaerythritol (>98%), while impurities such as formals are kept to a minimum. In alkyd production, the presence of formals can have adverse effects on processing properties and the final alkyd paint properties. Compared to other less pure products, Perstorp Penta offers you the following technical advantages when producing medium-oil alkyd resins.

- Reduced reaction time and reduced total cycle time
- Lower color value can be obtained
- Faster drying
- Better water resistance

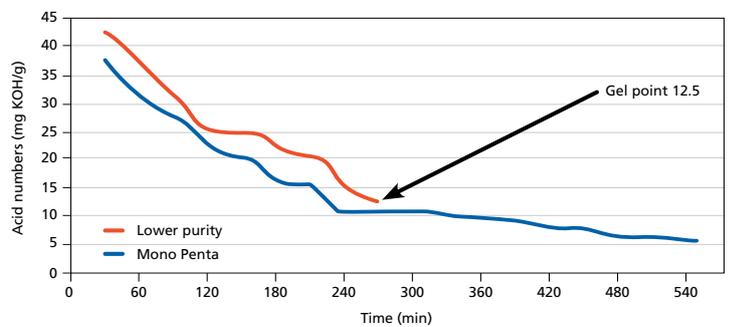


Effect of total esterification time for a long-oil alkyd (65%) when comparing Perstorp Mono Penta to a pentaerythritol of lower purity

Security & high purity

You can be confident that the product specification of Perstorp Penta is always accurate. This is especially important when developing resin formulations with narrow process latitude, where the final acid value of the polyester is close to the acid value where gel formation occurs. The presence of high amounts of formals in low purity pentaerythritol changes the average functionality of the product and risks gel points at significantly higher acid values than those calculated. With our high purity Penta, we ensure that you achieve the resin properties you require without risking fatal problems in production.

The graph below shows the acid numbers at gel point when producing short-oil alkyds (oil length 35%) based on Perstorp Mono Penta compared to a product of lower purity. The process latitude was doubled using Perstorp Mono Penta since the gel point was reached after over twice the reaction time of the lower purity product.



Acid numbers at gel point based on Perstorp Mono Penta vs. a pentaerythritol of lower purity

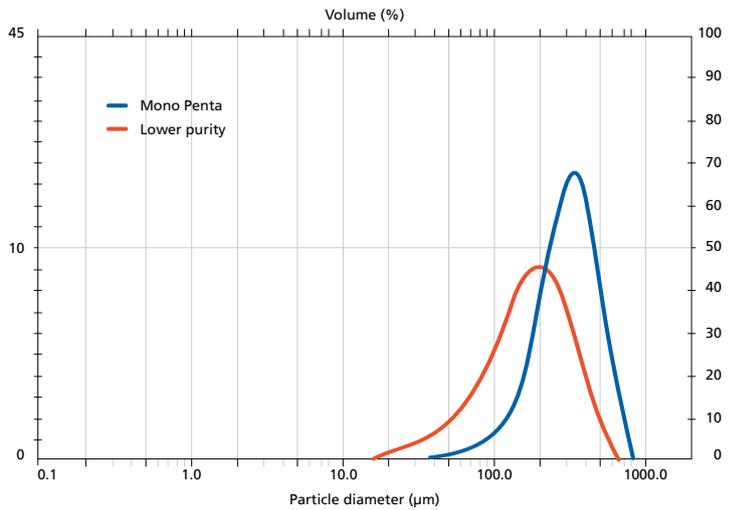


Added handling value

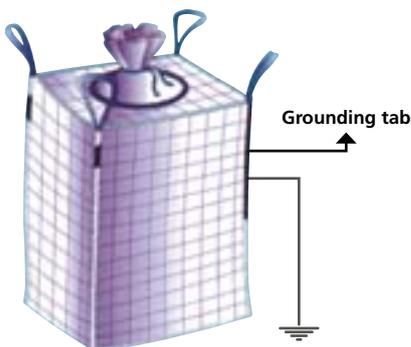
The presence of impurities such as formals in Pentaerythritol can also have a detrimental effect on particle size and result in severe dusting. Perstorp Penta is carefully purified and crystallized to yield a product with the right free-flowing properties while minimizing the fine particles that cause dusting. This facilitates safe and convenient bulk handling in big-bags.

Efficient & secure big-bag system

As a reliable partner we guarantee safe handling and therefore we have also developed a superior big-bag system that eliminates the risk of dust explosions. When using pentaerythritol in bags made of inferior fabrics you risk static discharges that could ignite solvent fumes and cause explosions. Ensure the safety of your production with Perstorp Penta, a smart secure solution.



Difference in particle size distribution between Perstorp Penta and a pentaerythritol of lower purity



Reliable performance

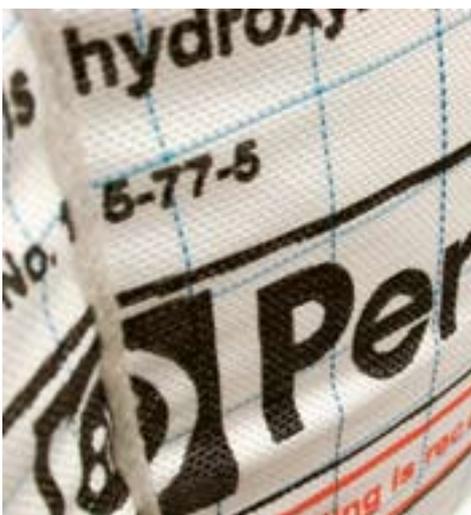
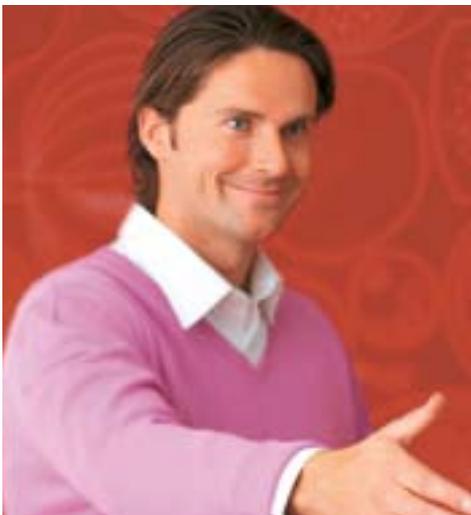
Added logistics value

We deliver globally competitive service and logistics solutions wherever your production is located. With production sites on three continents, in Sweden, Germany, India and the USA, we can provide superior and cost-effective benefits that specifically match your needs. And subsidiaries and local representatives always guarantee deliveries on short lead times.

In order to optimize your production we can tailor logistics to match your needs. Choose from several package sizes, from small bags to bulk deliveries, to find the best solution to promote efficient production. Most of our bags are recyclable, providing a more economical and environmentally sustainable solution.

Winning partnership

Our ambition is to be your reliable and trusted business partner. In this close relationship our global presence provides you with care, confidence and performance. In essence we offer delivery with precision. Trust is an extra value and results from acting reliably. Reliable solutions mean low risk and extra profit in your production.



Added value across the board

Working with us ensures you state-of-the-art quality and competitive service. And you are secure in knowing that we have the resources required for continuous development of purity, quality and stability. Win-win is the formula for a successful long-term partnership.

Environmental responsibility

One of the most important elements contributing to our success as the leading global supplier of Penta is our ability to handle health, safety and environmental issues responsibly. All of our production plants maintain the highest standard and fulfill rigorous environmental requirements. We can never afford to endanger the environment and we believe in balancing environmental sensibility, customer demands and economic realities to achieve winning formulas. So if environmental responsibility is a part of your business, Perstorp is your natural partner.

Shared know-how

Perstorp Sales and Technical Teams are ready to assist you individually with logistics and technical matters. Our extensive application know-how within alkyd resins is at your service and you are welcome to visit our own coatings production site in Sweden to learn more.

Product data summary

Product	Appearance	Molecular weight g/mol	OH-value mg KOH/g	Mono Penta typical %	Di-Penta typical %	Formals typical %	Melting point °C
Pentaerythritol (Penta) Nitration grade	Crystals Specific particle size	136.4	1,645	99	0.2	0.3	262
Pentaerythritol Mono grade	Crystals	136.4	1,645	99	0.3	0.4	262
Pentaerythritol Tech grade	Crystals	142.5	1,615	90	7.5	1.0	248



We welcome your questions. More detailed information and specifications of each product are available on www.perstorp.com or through your Perstorp sales representative.





Your Winning Formula

The Perstorp Group is the world leader in several sectors of the specialty chemicals market. Few chemical companies in the world can rival its 125 years of success. Today we have a rich performance culture distilled from our long history and extensive knowledge in the chemical industry. That culture and knowledge base enables us to produce Winning Formulas for a wide variety of industries and applications.

Our products are used in the aerospace, marine, coatings, chemicals, plastics, engineering and construction industries. They can also be found in automotive, agricultural feed, food, packaging, textile, paper and electronics applications.

Our production plants are strategically located in Asia, Europe and North and South America and are supplemented by sales offices in all major markets. We can offer you a speedy regional support and a flexible attitude to suit your business needs.

If you want a chemical partner who can offer you focused innovation to enhance your product or application, which is delivered reliably and responsibly look no further. We have a winning formula waiting for you.