



## The world's first food-contact-approved polymeric aziridine crosslinker

Boost the performance of your waterborne packaging primer, ink, and coating formulation

**NeoAdd® PAX**



# A breakthrough innovation for aziridine-based crosslinkers

**NeoAdd® PAX** offers key functional performance advantages compared to most carbodiimide-based waterborne coating systems, such as adhesion improvement and chemical resistance even at lower dosing levels.

**NeoAdd® PAX** achieves this high functional performance whether coatings are cured at room temperature, at elevated temperature, or under stoving conditions. Additionally, our crosslinkers enable excellent water resistance as well as great scuff and abrasion resistance.

# Key benefits of NeoAdd® PAX



Great adhesion of the cured film to a wide range of substrates



Good formulation stability after addition of crosslinker



Crosslinks all carboxylic acid functional resins



Suitable for direct and indirect food-contact application



Excellent chemical and scratch resistance of the cured film



Quick and efficient processing at room temperature



Low toxicity reduces labeling requirements



## Addressing the needs of people and planet

At Covestro, we have a long history of developing truly innovative coating resins and crosslinkers that meet the needs of our customers and our planet. That's why we are proud to present a novel, world-first solution: our food-contact-approved polymeric aziridine crosslinker family: **NeoAdd® PAX**. Boost the performance of your waterborne packaging primer, ink, and coating formulation.

Developed by our dedicated team of experts who draw on our global scientific capabilities, this polymeric aziridine delivers the reactivity of traditional aziridines, but – thanks to its high molecular weight and specially designed polymer structure – offers much lower levels of toxicity. As such, it enables strong, resistant, and durable coatings that open up new possibilities for a wide range of markets around the world, including industrial, architectural, packaging, ink, adhesives, and leather.





## NeoAdd® PAX

A breakthrough food-contact-compliant crosslinker family for direct and indirect food contact.

A safer, more sustainable solution

**NeoAdd® PAX** gives new possibilities to a diverse set of markets, including packaging, by delivering all the performance of traditional aziridine crosslinker technology, but now with broad food contact compliance for use in inks, overprint varnishes, coatings, and adhesives.

The **NeoAdd® PAX** products have been petitioned for addition to the relevant food-contact laws for the relevant authorities. After a thorough review by the competent bodies, we have received positive opinion letters from the Dutch, German, and Swiss authorities for listing in their official food legislation. This means that **NeoAdd® PAX** will be listed in the Swiss Ordinance, the Dutch Commodities Act and the new German ink ordinance; an external confirmation of the safety and food-contact suitability of the **NeoAdd® PAX** product line.

**NeoAdd® PAX** products have passed all toxicological and migration tests required to proof suitability in food contact applications



## Greater safety won't compromise performance

All the performance of traditional aziridines

What's more, this greater safety won't compromise performance: with **NeoAdd® PAX**, we've made it possible to combine low toxicity with high reactivity. As a polymeric aziridine, **NeoAdd® PAX** offers all the established performance benefits of aziridine chemistry without the drawbacks. This makes it competitive with carbodiimide alternatives on toxicity levels, while delivering much higher levels of functional performance – in particular, higher chemical resistance at lower dosing levels.

When tested in coating systems ranging from inks to packaging, flooring, and even industrial OEM, **NeoAdd® PAX** delivers a performance comparable to traditional aziridines – and far outperforms carbodiimide crosslinkers in chemical resistance and mechanical properties.



## NeoAdd® PAX dramatically reduces labeling requirements

Half the labeling

The low toxicity of **NeoAdd® PAX** products doesn't just make them better for people's health – it allows converters, ink, formulators and paint manufacturers from a wide range of industries to remove critical safety labels, making production safer for their employees, and their products more attractive to their consumers. As awareness around safety increases, these labeling limitations have been a key factor in the use of lower-performance crosslinkers as aziridine alternatives.

In fact, **NeoAdd® PAX** requires only one or two safety labels, one of which applies to the solvent it is dissolved in, rather than the polymeric aziridine itself. This puts our low-toxicity polymeric aziridine on a similar labeling level to most carbodiimides.



## Improves processing efficiency, saving money, time, and energy

### Driving processing efficiency

It's not just the low toxicity of **NeoAdd® PAX** that makes it more sustainable – our crosslinker is also operational over a wide temperature range. Specifically, unlike carbodiimides, which are typically cured at 80°C, **NeoAdd® PAX** can be cured at room temperature. This means that no stoving is required – which improves processing efficiency, thereby saving money, time, and energy. By helping to reduce energy consumption and carbon emissions, **NeoAdd® PAX** enables key sustainability advantages.



## NeoAdd® PAX enhances good adhesion to a wide range of substrates

### Adhesion that sticks, sticks, and sticks

That's not all, though. A wide range of industries, including the ink and coating industry, can reliably benefit from the unique properties of **NeoAdd® PAX** products. Aziridines are well-known for providing good adhesion to plastics, especially treated plastic packaging films, and these new polymeric aziridines are no exception. Indeed, **NeoAdd® PAX** delivers good adhesion to a wide range of substrates, and even outperforms traditional aziridines in some cases. So whether your coating is designed for industrial wood, metal, fabric, or leather, **NeoAdd® PAX** has you covered, again and again.





Thanks to high levels  
of stability in water,  
**NeoAdd® PAX** extends pot  
life from days to weeks

### Stability over time

If you're looking for flexible and reliable application, **NeoAdd® PAX** has your back. Thanks to its special chemical properties and high levels of stability in water, the viscosity of the formulation does not change over a period as long as a week, depending on the pH of the coating system used. In this way, it improves product reliability and allows manufacturers, converters, and applicators to reduce product waste – delivering high levels of efficiency without fail.



# A brighter horizon ahead

At Covestro, together with our partners from across the value chain, we're constantly developing new solutions to meet the evolving needs of our customers and end-users at a low environmental impact. Our **NeoAdd® PAX** crosslinker product family opens up a world of new possibilities for waterborne coatings by offering a low-toxicity, high-performance crosslinking solution – but we're not stopping there.

In the coming years, we'll keep pushing the boundaries of coatings chemistry, adding new products to the **NeoAdd® PAX** family that meet customers' specific needs and deliver even higher performance standards. As such, thanks to our cutting edge innovation, **NeoAdd® PAX** will help enable a brighter future, where sustainability, safety, and long-lasting functional performance are all possible.

## First **NeoAdd® PAX** products

The **NeoAdd® PAX** product line consists of 3 distinct products:

**NeoAdd® PAX-521, NeoAdd® PAX-523, and NeoAdd® PAX-524.** They provide similar performance boosts, but are diluted in different solvents, providing different compatibility properties with different formulations and end-applications.

### **NeoAdd® PAX-521**

Ideal for ink manufacturers and converters, it is designed for use in water-based inks, lacquers, coatings, and adhesives. It is approved for listing in all important food contact legislation by the Dutch, Swiss, and German authorities and is suitable for direct food-contact applications. **NeoAdd® PAX-521** is supplied as an 80% solution in ethyl acetate for use in various inks and coatings to improve chemical resistance and mechanical properties, as well as enhance adhesion.

### **NeoAdd® PAX-523**

Developed for paint and ink manufacturers, it is specifically designed for use in waterborne industrial and architectural coating systems where great performance is required. **NeoAdd® PAX-523** is supplied as an 80% solution in methoxy propyl acetate and can be used in a wide range of paints, floor coatings, plus leather and textile coatings, to improve their chemical resistance and mechanical properties.

### **NeoAdd® PAX-524**

This product is supplied as a 50% solution in Proglyde™ DMM. This product is easily miscible when used in waterbased formulations. In addition, it has a high boiling point, so the product as such is not labeled as flammable liquid. As a universal product suitable for inks, overprint varnishes, and packaging coatings, **NeoAdd® PAX-524** is specifically designed for use in waterborne inks and coatings to improve adhesion, chemical resistance, and mechanical properties.



Covestro Deutschland AG  
Kaiser-Wilhelm-Allee 60  
51373 Leverkusen  
Germany

[solutions.covestro.com](https://solutions.covestro.com)

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<sup>1</sup>Please see the "Guidance on Use of Covestro Products in a Medical Application" document.

Edition: 2024