



Unveiling Kuraray Poval™ (PVOH) for Sustainable Agriculture

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Enhancing Seed Performance with Kuraray Poval™ Coatings

Seeds are the foundation of agriculture, and maximizing their potential is key to achieving optimal yields. One innovative method for enhancing seed performance is through the use of polyvinyl alcohol (PVOH) coatings.

Protective Film for Enhanced Performance

When seeds are coated with Kuraray Poval™, they are enveloped in a protective film. This film serves multiple purposes, including dust reduction and protection against environmental stressors. The water solubility and mechanical strength of the PVOH film can be precisely controlled, ensuring tailored protection for each seed.

Improved Germination and Performance

One of the most significant benefits of Kuraray Poval™ coatings is their ability to improve germination rates. By creating an optimal microenvironment around the seed, PVOH coatings promote faster and more uniform germination. Additionally, the enhanced protection provided by the PVOH film can lead to improved seedling vigor and overall crop performance.

Versatile Application Methods

Kuraray Poval™ coatings offer versatility in application methods, allowing for seamless integration into existing seed treatment processes. Whether through seed coating equipment or specialized application techniques, PVOH coatings can be efficiently applied to a wide range of seed varieties.

Aiding Delivery of Active Ingredients

Beyond their protective properties, Kuraray Poval™ coatings serve as an effective binder for incorporating active ingredients into seed treatments. This technology facilitates the precise delivery of agrochemicals, fertilizers, and other additives directly to the seed surface. By enhancing the efficiency of nutrient uptake and pest control, PVOH coatings contribute to improved crop health and yield potential.

PVOH becomes a microplastic?

Recent regulations by the European Union Commission have brought attention to the issue of synthetic polymer microparticles, commonly known as microplastics. Regulation (EU) No. 2023/2055 aims to restrict the use of microplastics in various products and applications.

According to the regulation, polymers with a solubility of more than 2 g/L are not designated as microplastics. Additionally, degradable polymers meeting specific criteria outlined in the regulation are also exempt.

We can state that partially saponified Kuraray Poval™ grades (with a degree of hydrolysis less than 92%), have passed the solubility test (>2 g/L) in accordance with the Regulation (EU) No. 2023/2055 Appendix 16`Rules on proving solubility.

In other words, these grades are **microplastic-free**.

For various applications, the following Kuraray Poval™ grades are specified:

ENCRUSTING:

Kuraray Poval™ 8-88 and Kuraray Poval™ 22-88.

FILM COATING:

Kuraray Poval™ L-508W and Exceval™ RS-1717.

PELLETING:

Kuraray Poval™ 6-88 and Kuraray Poval™ 13-88.

These Kuraray Poval™ grades are recommended for their specific properties suited to each application. However, recommendations may vary depending on the customer's specific needs and requirements.

As we navigate the challenges of environmental sustainability, it's crucial for industries to prioritize the use of materials that meet regulatory standards and contribute to a cleaner, greener future.



Key Benefits in Seed Coatings



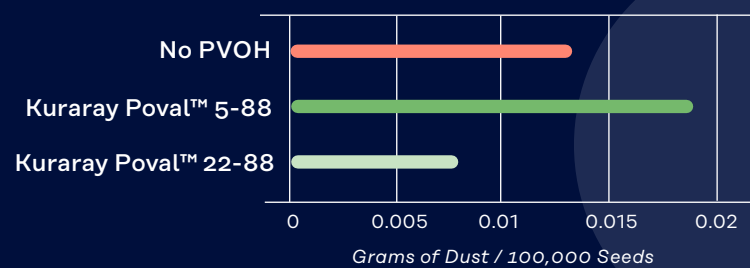
The utilization of Kuraray Poval™ in seed coatings offers a multitude of benefits, including:

1

LOW DUST-OFF PROPERTIES:

Dust generation of soya bean is significantly reduced by coating seeds with PVOH, leading to improved handling efficiency and reduced environmental impact

Figure 1. Dust generation of soybean seed





2

IMPROVED GERMINATION:

In contrary to concerns about coating materials negatively impacting germination rates, soya bean seeds coated with Kuraray Poval™ demonstrated no negative or even enhanced germination performance. Cold germination rates, in particular, have shown improvement with Kuraray Poval™ coatings, potentially due to the controlled moisture content provided by the coating.

Figure 2. Warm germination of soybean seed

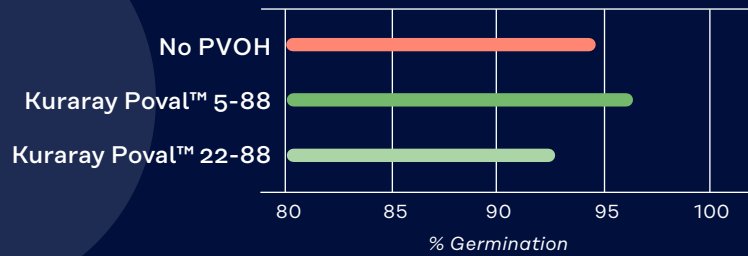
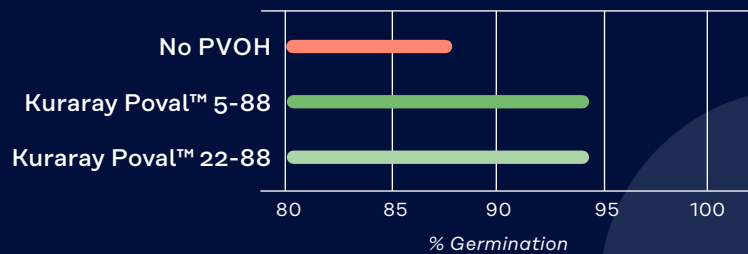


Figure 3. Cold germination of soybean seed



3

HIGH BONDING POWER:

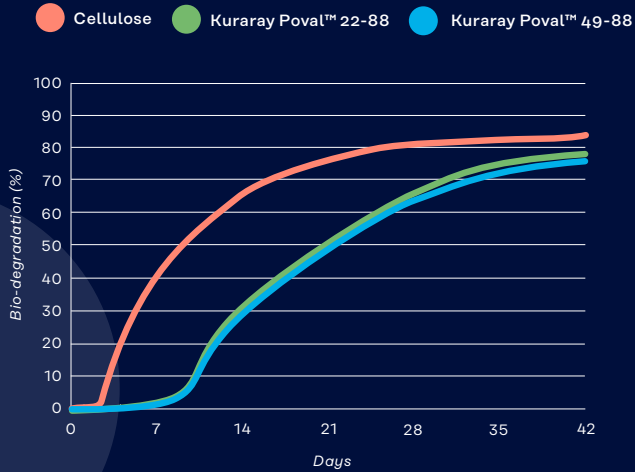
Kuraray Poval™ coatings exhibit exceptional bonding power, ensuring that the coating layer adheres well to the seed surface, providing durable protection throughout the germination and early growth stages.

4

INHERENT BIODEGRADABILITY:

Kuraray Poval™ is recognized as one of the few vinyl polymers that are water-soluble and inherently biodegradable in the presence of microorganisms.

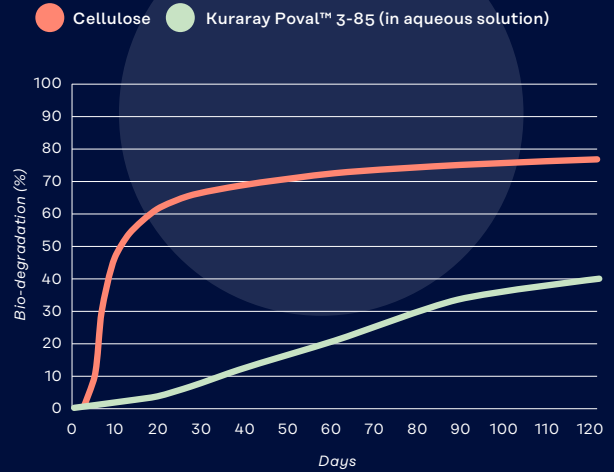
Figure 4. Biodegradability in water



Biodegradation test results of Kuraray Poval™ with different degree of polymerization.

Test guideline: ISO 14851
 Test organization: OWS nv (Normec OWS)
 Sludge concentration: 100 mg / L
 Sample concentration: 100 mg / L
 Biodegradability (%) was calculated from oxygen consumption by micro-organisms.

Figure 5. Biodegradability in soil



Kuraray's external biodegradation in soil test result following ISO 17556 is shown.

After 122 days, biodegradation of Kuraray Poval™ 3-85 has proceeded further and an absolute biodegradation of 39.2% was measured.

Kuraray Poval™ needs to be dissolved in water for an efficient biodegradation process.





Conclusion

In summary, Kuraray Poval™ (Partially Saponified PVOH) coatings represent a cutting-edge, microplastic-free solution for enhancing seed performance and crop productivity. By providing tailored protection, improving germination rates, and aiding in the delivery of active ingredients, Kuraray Poval™ coatings offer a multifaceted approach to seed treatment. As agriculture continues to evolve, innovations like Kuraray Poval™ coatings play a crucial role in meeting the challenges of modern and sustainable farming.

Adding value to your products – worldwide

Kuraray Poval™, Exceval™, Elvanol™ and Mowiflex™ are the trademarks for polyvinyl alcohols made by Kuraray. Their key characteristics — outstanding film-forming properties and high binding strength — add real value to your products. Our polymers are water-soluble, highly reactive, crosslinkable and foamable. They have high pigment binding capacity, protective colloid characteristics and thickening effects. The physical and chemical properties of Kuraray Poval™ make it ideal for a wide variety of applications, ranging from adhesives through paper and ceramics to packaging films. Many of our polymers are food contact-approved and thus suitable for food applications.

Kuraray produces its wide range of Kuraray Poval™ grades in Japan, Singapore, Germany and the USA. Kuraray's global production and service network make us your partner of choice for innovative high-quality PVOH resins.



Kuraray Poval™

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