

Specialty PVOH for Detergent Sheets

- ✓ Fast solubility
- ✓ Low residue
- ✓ Inherently biodegradable
- ✓ Good detergent compatibility
- ✓ Local production

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Kuraray Poval™

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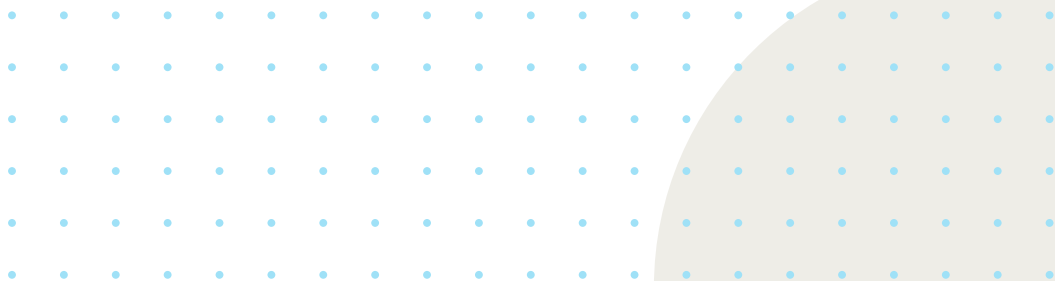
Specialty PVOH for Detergent Sheets

Polyvinyl alcohol (PVOH) is the preferred binder for all types of detergent sheets due to its excellent water solubility, strong binding power, and good compatibility with a wide range of detergents. Furthermore, PVOH is inherently biodegradable in water and provides mechanical strength to detergent sheets while maintaining a soft touch.

Our broad portfolio of KURARAY POVAL™ provides the ideal balance between fast solubility, low residue, high binding power and good mechanical strength. Moreover, our global production network ensures a local supply of PVOH, supporting our customers in meeting their sustainability goals.

To assist the selection of suitable grades for detergent sheets, a laboratory study was conducted using a relevant formulation that included the following ingredients: PVOH, sodium dodecyl sulfate, ethoxylated lauryl ether, cocamidopropyl betaine, glycerol, tetrasodium EDTA, sodium citrate, and sodium carbonate.

Important parameters for detergent sheets, which are influenced by the PVOH grade are undissolved residue, dissolving speed and migration of detergents from the sheets.



Undissolved residue

Grades such as KURARAY POVAL™ 5-88 (6-88) and 22-88 are commonly used in detergent sheet formulations. However, these can lead to significant amounts of undissolved residue, especially after extensive storage (see Figure 1).

Utilization of grades with lower degree of hydrolysis, such as KURARAY POVAL™ 5-74 and 32-80, or modified grades like KURARAY POVAL™ 3-86 SD contribute significantly to reduce residue in detergent sheets.

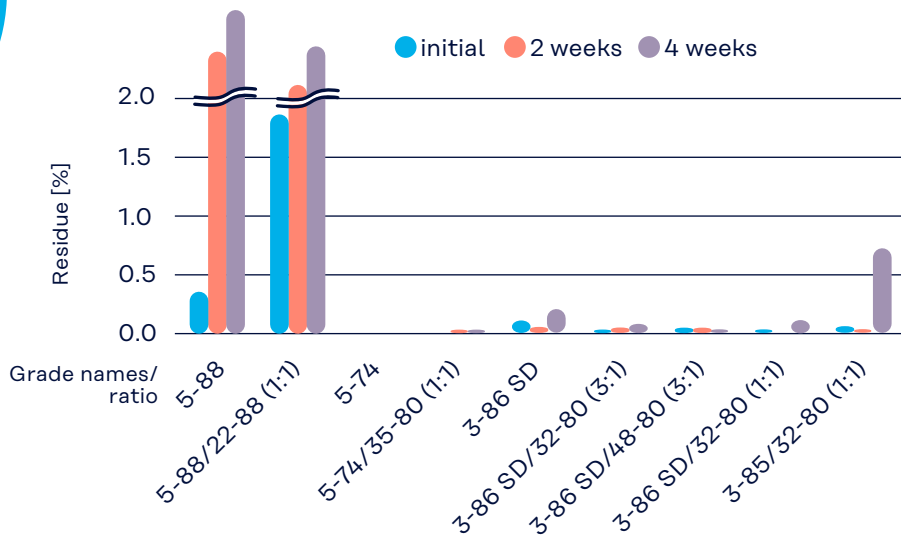


Figure 1. Impact of various grades of KURARAY POVAL™ on undissolved residue of detergent sheets after storage at 38 °C and 80 % relative humidity for up to 4 weeks. Residue was determined by filtration after strong agitation of the detergent sheet in water at 18 °C for 10 minutes.

Sheet Density, Detergent Compatibility, and Solubility

Other important parameters of detergent sheets include sheet density, which has a great impact on dissolving speed and compatibility with detergents, which influences the stickiness of the sheet. Generally, adding a certain amount of higher-viscosity PVOH, such as KURARAY POVAL™ 32-80 or 35-80, helps to enhance foam stability and detergent binding capacity, which will result in lower density, faster dissolution, and less stickiness (see Figure 2). On the other hand, high-viscosity PVOH grades dissolve more slowly than low-viscosity ones, so that both types of PVOH need to be used in the right proportions. Additionally, grades with a low degree of hydrolysis tend to have better compatibility with non-ionic detergents.

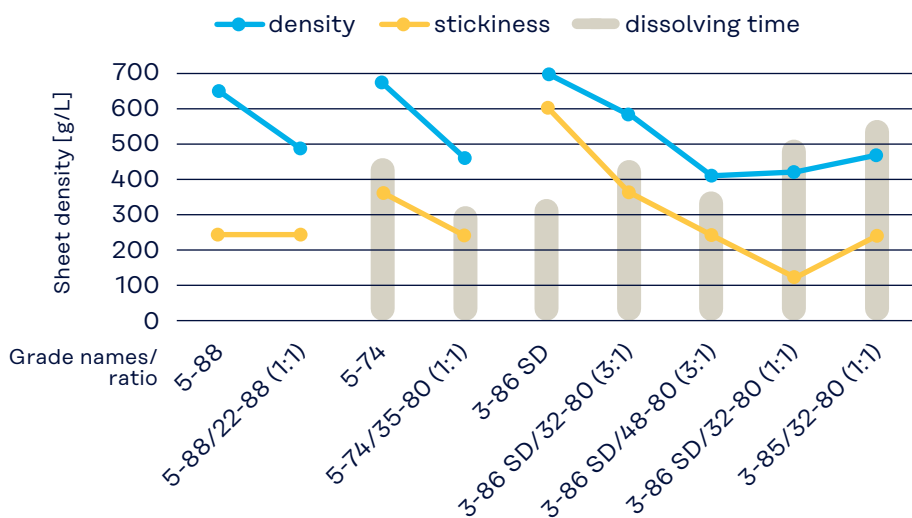


Figure 2. Impact of various grades of KURARAY POVAL™ on sheet density, stickiness and dissolving time of detergent sheets. Lower values indicate better performance. Stickiness and dissolving time are shown in arbitrary units.



Biodegradability of KURARAY POVAL™

For all detergent products that end up in the waste water system biodegradability is of high importance. KURARAY POVAL™ is an inherently biodegradable polymer and, several grades pass the OECD 301B criteria of >60 % biodegradation within 28 days. Detailed data is available upon request.

KURARAY POVAL™ and Microplastics

In line with Regulation (EU) No. 2023/2055, which sets definitions and defines testing methods for synthetic polymer microparticles, our products have been evaluated. Grades of KURARAY POVAL™ mentioned in this brochure are excluded from the synthetic polymer microparticle definition due to their excellent water solubility.



Local Production and Sustainability

Kuraray is the manufacturer of PVOH with a truly global production footprint, enabling local supply with reduced transportation impact and enhanced sustainability. Life Cycle Assessment (LCA) data is available upon request.

For most of our grades, we are able to offer ISCC PLUS certified alternatives that are linked to bio-circular feedstocks under a mass balance approach. As local product portfolios may vary, please reach out to your local contact to find the most suitable solution.

Certificate
Holder



ISCC

International Sustainability
& Carbon Certification



Summary

In conclusion, specialty grades of KURARAY POVAL™ are able to contribute significantly to reduce residue, improve solubility and enhance detergent compatibility in detergent sheets. The most suitable grades will depend on the overall detergent recipe.

Therefore, please contact your local technical service or sales representative to discuss in detail.

Adding value to your products – worldwide

KURARAY POVAL™, EXCEVAL™, ELVANOL™, and MOWIFLEX™ are the trademarks for polyvinyl alcohol (PVOH) resins 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 United States. 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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