

# KURARAY POVAL™ Modified Grades

## Technical data sheet

### Characteristics

Modified polyvinyl alcohol (PVOH) grades with varying degrees of polymerization, hydrolysis and co-monomers.

### Recommended Uses

Ranging from binder for inorganic substances, emulsification agent, adhesive, and binding agent.

### Form supplied

Granules / fine powder with defined grain size.

### Specifications

The data are determined by our quality control for each lot prior to release.

### KURARAY POVAL™ Modified Grades

Type	Grade [ KURARAY POVAL™ ]	Viscosity <sup>1)</sup> [mPa·s]	Hydrolysis [mol.-%]	Volatile Max [%]	Ash Max <sup>2)</sup> [%]	pH
K series	25-88 KL	20.0 - 30.0	85.0 - 90.0	5.0	1.5	5.0 - 7.0
SD series	3-86 SD	2.4 - 3.4	83.0 - 88.0	5.0	1.8	n.a.
R series	25-98 R	20.0 - 30.0	98.0 - 99.0	5.0	0.6	n.a.
KX series	105-88KX	90.0 - 120.0	87.0 - 89.0	5.0	0.4	5.0 - 7.0
	200-88KX	175.0 - 225.0	87.0 - 89.0	5.0	0.4	5.0 - 7.0

Note: 1) Viscosity is measured at 4% aqueous solution at 20°C determined by Brookfield synchronized-motor rotary type.  
2) Ash content is measured at dry basis as Na<sub>2</sub>O.

### Additional data, valid for all KURARAY POVAL™ grades

The first number in the nomenclature denotes the viscosity of the 4 % aqueous solution at 20 °C as a relative measure for the molar mass of the KURARAY POVAL™. The second number denotes the degree of hydrolysis of the polyvinyl acetate from which the KURARAY POVAL™ grade is derived.

### Properties and uses

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Polyvinyl alcohols are water-soluble polymers manufactured by alcoholysis of polyvinyl acetate. The properties of the various grades are mainly governed by the molecular weight and the remaining content of acetyl group.

At the same degree of hydrolysis, the carboxylate polymer (K-Series), has stronger hydrophilic property than conventional PVOH even at a lower degree of hydrolysis. Therefore, K-Series has a good affinity to hydrophobic substances such as polyester, polystyrene etc. as well as a good water solubility. Due to its advantageous hygroscopic property, films produced from K-Series are soft and flexible at standard condition (20° C, 65% RH) or under higher humidity. K-Series can react with aluminum sulphate  $Al_2(SO_4)_3$  to form a gel, enabling K-Series to work effectively in the field of paper sizing. Furthermore, K-Series are less sensitive to salting-out effects, judged with comparable conventional PVOH.

R-Series are water-soluble polymers, which molecular structure contains peculiar functional groups, i.e., silanol groups. The silanol groups are reactive with inorganic substances such as silica or alumina. R-Series can be applied with inorganic substances to form water resistant films. R-Series are mainly used as a binder for inorganic substances and as a surface coating agent for organic materials which contain inorganic substances such as e.g. paper.

## Processing

### Preparation of KURARAY POVAL™ solutions

KURARAY POVAL™ is usually processed as an aqueous solution. The solution should be prepared in corrosion-resistant vessels. As a first step KURARAY POVAL™ is sprinkled into cold water during stirring and heated to 90 - 95 °C in a water bath or by the use of live steam. The solution should be stirred during cooling in order to prevent skin formation. The speed of dissolution increases with increasing temperature. The speed of dissolution decreases with increasing molecule size. The dissolving process is also made more difficult when there is a transition to higher concentrations. As a result even a more highly concentrated KURARAY POVAL™ solution should be produced at temperatures of 90 -95 °C.

Polyvinyl alcohol solutions may produce foam when stirred or during transport in pipelines, but this can be largely prevented by using a suitable stirrer design such as a low-speed anchor stirrer or by avoiding steep downward gradients in the pipelines.

### Preservation

Like any other polyvinyl alcohol, KURARAY POVAL™ in the form of an aqueous solution can be attacked by micro-organisms under certain conditions. In the acidic pH range the main organisms reproduced are the fission fungi, whilst bacteria grow most readily in a neutral to weakly alkaline medium. The solution can be preserved from any micro-organism attack by adding a preservative. Quantities of about 0.01 - 0.20 % by weight preservative, relative to the KURARAY POVAL™ solution, are generally sufficient. Compatibility and efficiency must be tested. Information on the quantity to be used is available from the suppliers.

It is advisable for the KURARAY POVAL™ solution to be prepared and stored in clean containers. Considering the resistance that may be shown by some microorganisms to the preservatives employed, the dissolving vessel in particular, together with the filling equipment (pipes, valves, tubing etc.), needs to be kept clean. Any skins or incrustations should be removed. In the event of complications the possibility of changing to a different preservative must be considered.

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Certain applications for KURARAY POVAL™ in solution (cosmetic preparations, finger paints etc.) require the preservatives employed to be of approved types and physiologically inert. In such instances it is essential for the relevant legal regulations regarding physiological effects to be taken into account.

### Storage

KURARAY POVAL™ can be stored for an unlimited period of time under appropriate conditions that is in its original packs in closed, dry rooms, at room temperature.

### Industrial Safety and Environmental Protection

Not classified as a dangerous substance or preparation according to the current criteria of chemical legislation. A safety data sheet is available on request.

### Special remarks

#### Status as governed by foodstuffs legislation

Refer to the KURARAY POVAL™ webpage for regulatory information.

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#### Manufactured by Kuraray Co., LTD.

<https://www.kuraray-poval.com/ja/>