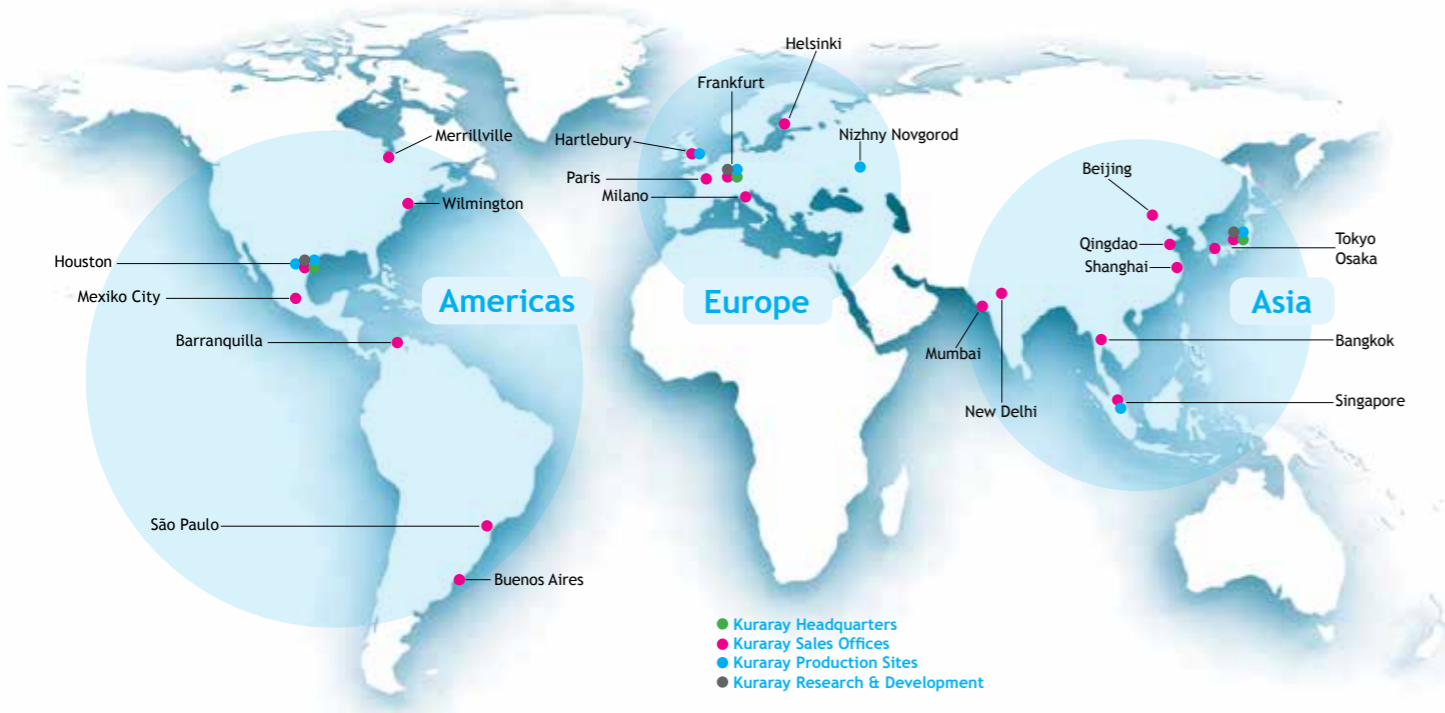


Adding value to your products - worldwide

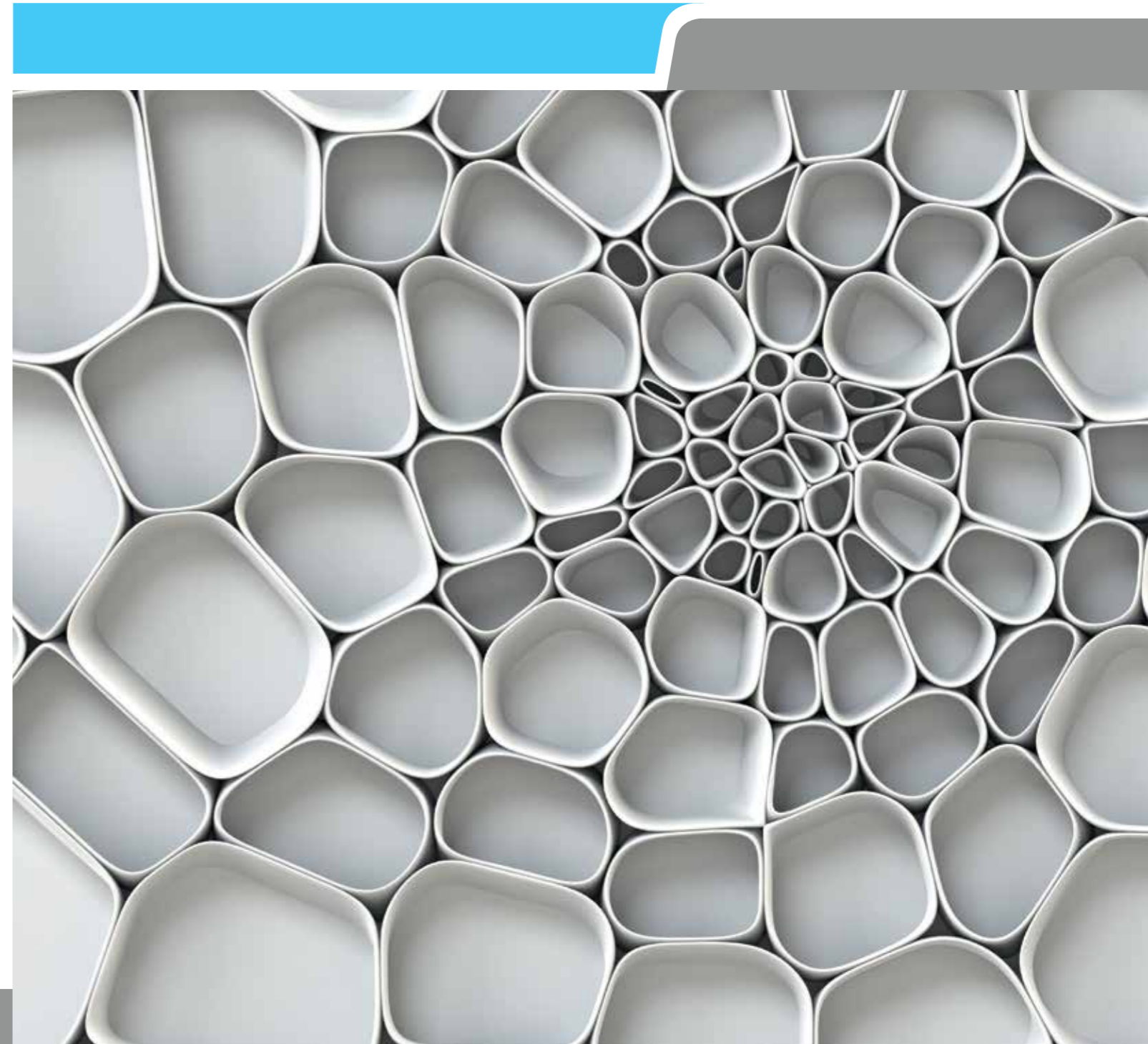


KURARAY POVAL™, EXCEVAL™, ELVANOL™ and MOWIFLEX™ are the trademarks for polyvinyl alcohols made by Kuraray. Their key characteristics – outstanding film-forming properties and high binding strength – add real value to your products. Our polymers are water-soluble, highly reactive, crosslinkable and foamable. 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. Ecologically KURARAY POVAL™ is advantageous due to its biodegradability and the fact that combustion does not generate residues. It is available in various particle sizes from granules to fine powders. 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 - Here to Innovate.**

KURARAY POVAL™ / EXCEVAL™

Temporary Binder for Ceramics



Kuraray America, Inc.

2625 Bay Area Blvd.,
Suite 600 Houston, TX77058
United States of America
Phone: +1 800 423 9762
info.kuraray-poval@kuraray.com

Kuraray Europe GmbH

Philipp-Reis-Str. 4
65795 Hattersheim am Main,
Germany
Phone: +49 69 305 85 351
info.eu-poval@kuraray.com

Kuraray Asia Pacific Pte., Ltd.

250 North Bridge Road
#10-01/02 Raffles City Tower
Singapore 179101
Phone: +65 6337 4123
infofoval.sg@kuraray.com

Kuraray China Co., Ltd.

Unit 2207, 2 Grand Gateway
3 Hongqiao Road, Xuhui Dis-
trict, Shanghai 200030, China
Phone: +86 21 6119 8111
infofoval.cn@kuraray.com

Head Office:

Kuraray Co., Ltd.

Ote Center Bldg.
1-1-13, Otemachi Chiyoda-ku
Tokyo 100-8115, Japan
Phone: +81 3 67 01 1000
infofoval.jp@kuraray.com

KURARAY POVAL™ / EXCEVAL™ Temporary Binder for Ceramics

KURARAY POVAL™ is used extensively across many ceramics applications ranging from tiles and pottery to ferrite as a temporary binder of ceramic particles. KURARAY POVAL™ improves the mechanical green strength of green ceramic bodies so they can pass through the production process

easily before sintering without breakage. Kuraray offers “low ash” products to prevent residues after sintering. Decomposition of KURARAY POVAL™ proceeds slowly compared with other known binders which helps to prevent sudden generation of decomposition gas.

KURARAY POVAL™ - Low Ash grades

Grade name	Viscosity ¹⁾ [mPa•s]	Degree of hydrolysis [mol%]	Non-volatile content [%]	Ash ²⁾ content [%]	pH
KURARAY POVAL™ 5-74 LLA	4.6 - 5.4	72.5 - 74.5	97.5 ± 2.5	≤ 0.1	5.0 - 7.0
KURARAY POVAL™ 4-88 LA	3.4 - 4.5	86.7 - 88.7	97.5 ± 2.5	≤ 0.09	4.5 - 7.0
KURARAY POVAL™ 8-88 LA	7.0 - 9.0	86.7 - 88.7	97.5 ± 2.5	≤ 0.09	4.5 - 7.0
KURARAY POVAL™ 4-98 LA	4.0 - 5.0	98.0 - 98.8	97.5 ± 2.5	≤ 0.09	4.5 - 7.0
KURARAY POVAL™ 20-98 LA	18.5 - 21.5	98.0 - 98.8	97.5 ± 2.5	≤ 0.09	4.5 - 7.0
KURARAY POVAL™ 56-98 LA	52.0 - 60.0	98.0 - 98.8	97.5 ± 2.5	≤ 0.09	4.5 - 7.0
KURARAY POVAL™ 28-99 LA	26.0 - 30.0	99.0 - 99.8	97.5 ± 2.5	≤ 0.09	4.5 - 7.0

1) of a 4 % aqueous solution at 20 °C DIN 53015 / JIS K 6726
2) calculated as Na2O

EXCEVAL™ for better green strength:

Hydrophobically modified polyvinyl alcohol, EXCEVAL™, provides the following advantages when used as a binder of ferrite bodies.

- ✓ Increased green strength
- ✓ Improved moldability
- ✓ Less crack after sintering which result in yield improvement

EXCEVAL™ grades for ceramics binder

Grade name	Viscosity ¹⁾ [mPa•s]	Degree of hydrolysis [mol%]	Non-volatile content [%]	Ash ²⁾ content [%]	pH
EXCEVAL™ RS-2117	25.0 - 30.00	97.5 - 99.0	97.5 ± 2.5	≤ 0.4	5.0 - 7.0
EXCEVAL™ AQ-4104	3.6 - 4.4	98.0 - 99.0	97.5 ± 2.5	≤ 0.4	5.0 - 7.0

1) of a 4 % aqueous solution at 20 °C DIN 53015 / JIS K 6726
2) calculated as Na2O

EXCEVAL™ contains a special hydrophobic group which enables a larger amount to be adsorbed on ferrite particles compared with conventional polyvinyl alcohols as shown in Fig.1. Such ferrite particles combined with EXCEVAL™ / KURARAY POVAL™ are usually spray dried and then moulded by dry press techniques. Due to the higher adsorption of EXCEVAL™ the system provides more uniform particles which results in better flowability. This better flow is proven by lower angle of repose as shown in Fig.2. (Repose is the steepest angle of descent from the horizontal plane to which a material can be piled without slumping). Better flow of the ferrite body is a strong advantage in providing better distribution of the particles within the mould in the dry press process. This allows pressure to be uniformly applied to the mould preventing cracking after sintering and thus improves the yield of the production process.

Fig. 1 Adsorption of EXCEVAL™ on ferrite particles

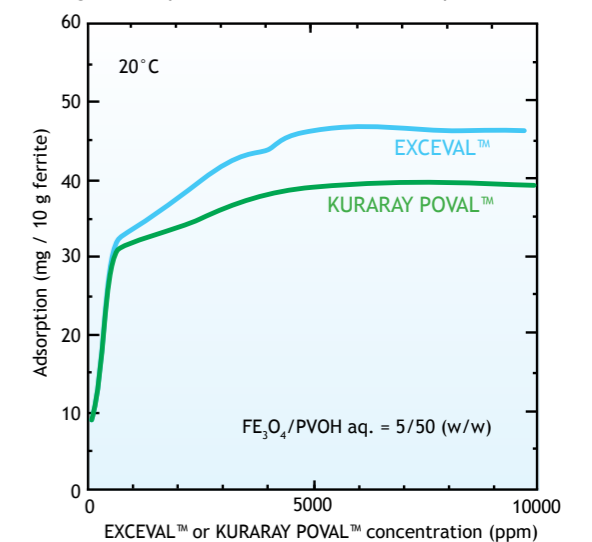


Fig.2 Angle of repose of spray dried ferrite particles

