

klucel™ MS hydroxypropylcellulose in marine coatings

who helps marine primers sail ahead of the rest?
we do.

Ashland launches **Klucel™ MS**, a new grade of hydroxypropyl cellulose as a thickener and anti-sagging agent **for inorganic zinc rich primers**. This brand new HPC technology enables a major improvement in dissolution speed in polar organic solvents, including methanol, isopropyl alcohol and xylene. Furthermore, the thickening efficiency has significantly improved compared to conventional HPCs.

Zinc-rich primers are used to protect steel surfaces from corrosion, principally through cathodic galvanic protection. Inorganic zinc rich primers typically use a silicate binder to promote zinc adhesion to the surface. Inorganic zinc-rich primers often contain higher zinc levels versus organic zinc primers. The combination of higher zinc levels and reactive silicate binders may provide superior corrosion resistance compared to their organic counterparts.

Klucel™ MS HPC is suitable for permanent and temporary coatings sprayed onto ship panels prior to welding:

- permanent inorganic zinc rich primers
- temporary inorganic zinc 'shop' primers (B part)



fig 1: Klucel™ MS HPC for rapid viscosity build-up in polar organic solvent

benefits

Klucel™ MS hydroxypropyl cellulose is a non-ionic water-soluble cellulose ether with a versatile combination of properties:

- designed for **rapid dissolution** in organic solvents (fig 1)
- provides **highest thickening efficiency** against chemistries commonly used as thickeners and anti-sagging agents for solvent based zinc-rich primers (fig. 2 and 3)
- soluble in water and multiple polar organic solvents used to control viscosity and **gives smooth and clear solutions** (fig 4)

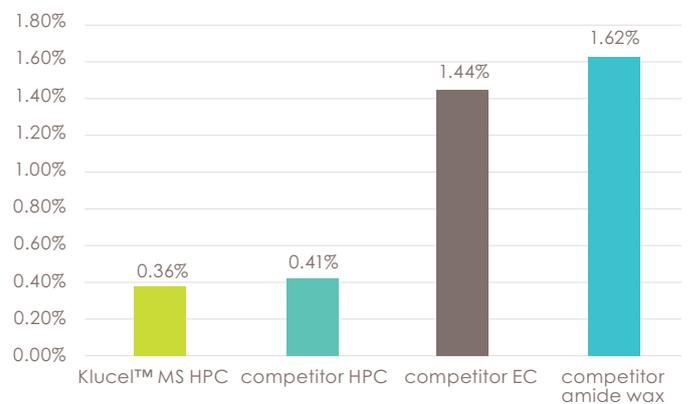


fig 2: Klucel™ MS HPC for high thickening efficiency (Stormer viscosity, 100KU)

fig 3: estimated low cost-in-use for 1 mt zinc dust formulation

product	dosage ¹	solvent separation ²	settling ²	estimated cost-in-use ³	relative dosage difference
klucel™ MS HPC	0.36%	no	no	\$108.00	100%
competitor HPC	0.41%	no	no	\$118.90	114%
competitor EC	1.44%	no	yes	\$244.80	400%
competitor amide wax	1.62%	yes	no	\$162.00	450%

¹ to achieve 100KU

² visual observation after overnight storage at room temperature

³ per mT using market pricing

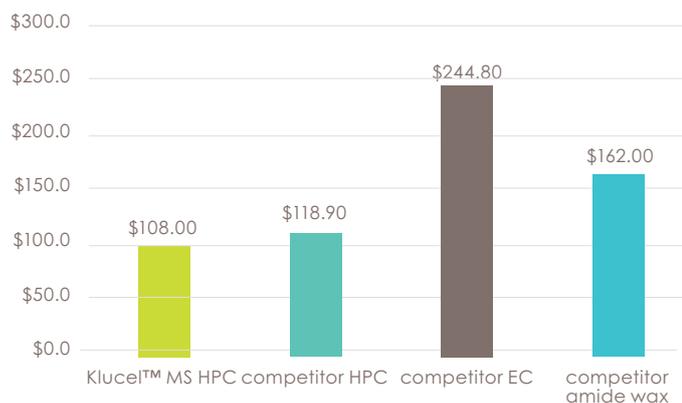
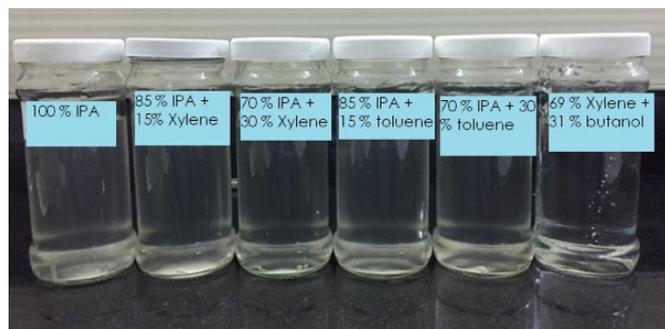


fig 4: 2% w/w Klucel™ MS HPC giving smooth and clear solutions in multiple polar organic solvents



packaging information

Material is packed in fiber drums of 100 lbs/45.36 kgs.

typical product properties of Klucel™ MS hydroxypropyl cellulose:

viscosity (2% visc., water, LV 25°C 4@12rpm)	4,000 – 7,000 cps
appearance	off-white powder
moisture content, as packed, %, max	6.0
moles of substitution	3.0 – 4.4
pH of 2% solution	4 – 10

guide formulation

Below you will find a guide formulation of a typical inorganic zinc rich primer containing Klucel™ MS hydroxypropyl cellulose:

components	at 0.5WT% of zinc powder	
IPA+Xylene (70:30)	23.92	
zinc dust powder	72.82	grinding
Klucel™ MS HPC	0.36	
IPA+Xylene (70:30) – used in post addition stage	3.9	post-addition
total	100	

Ashland – always solving™

As the global leader in rheology and performance enhancing (specialty) coatings additives, Ashland has offices, production facilities, laboratories and application specialists across North-America, Europe and Asia, dedicated to supporting new product development and providing technical assistance. For further information or technical support, you can reach us at: www.ashland.com/contact

REGIONAL CENTERS

North America
Bridgewater, NJ USA
Tel: +1 877 546 2782

Latin America
São Paulo, Brazil
Tel: +55 11 3649 0455
Mexico City, Mexico
Tel: +52 55 5276 6110

Asia Pacific
Singapore
Tel: +65 6775 5366
Mumbai, India
Tel: +91 22 61484646
Shanghai, P.R. China
Tel: +86 21 2402 4888

Europe
Schaffhausen, Switzerland
Tel: +41 52 560 5500

Middle East & Africa
Dubai, U.A.E
Tel: +971 4 352 3003

ashland.com/contact

The information contained in this brochure and the various products described are intended for use only by persons having technical skill and at their own discretion and risk after they have performed necessary technical investigations, tests and evaluations of the products and their uses. Certain end uses of these products may be regulated pursuant to rules or regulations governing medical devices, drug uses, or pesticidal or antimicrobial uses. It is the end user's responsibility to determine the applicability of such regulations to its products.

All statements, information, and data presented herein are believed to be accurate and reliable, but are not to be taken as a guarantee of fitness for a particular purpose, or representation, express or implied, for which seller assumes legal responsibility. No freedom to use any patent owned by Ashland, its subsidiaries, or its suppliers is to be inferred.

® Registered trademark, Ashland or its subsidiaries, registered in various countries

™ Trademark, Ashland or its subsidiaries, registered in various countries

© 2019, Ashland / IND19-015

