

Bright Future: HYDREX® P silicates for enhanced paper functionality

PRECIPITATED SYNTHETIC SILICATES TO ENHANCE PAPER PROPERTIES,
IMPROVE QUALITY AND COST SAVINGS



HYDREX® P Silicate – Key benefits

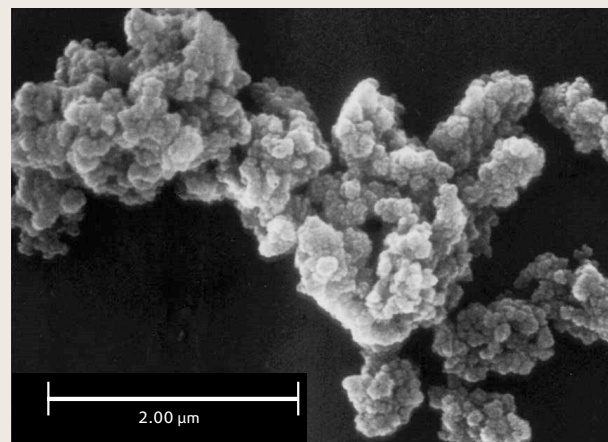
High pigment brightness	High light scattering powder	Improved coefficient of friction (CoF)	Porous / Fluffy structure	Improved print quality	No abrasive impurities	High purity
Higher brightness, whiteness and shade	Increased opacity in low basis weight grades	Less winder reject	Increased thickness, bulk and stiffness	Minimized printthrough	Lowest abrasion	Approved for food contract applications
Decreased need for pulp bleaching and OBA	Excellent performance in TiO ₂ replacement	Improved production efficiency	Possibility to decrease basis weight and use less chemical pulp	Higher print density	Low wear of paper machine parts	Suitable for acid and alkaline paper making
	Enables basis weight reduction			Lower ink demand	Higher paper machine uptime	
				Less missing dots		
				Fast ink drying		
				Less set-off		

HYDREX® P Silicate – Functional properties

HYDREX® P has a unique structure which gives superior optical, printing and physical properties to the paper products when added to the machine wet-end or to the coating layer. This multifunctional additive offers numerous benefits to paper and carton board products including improved brightness, opacity, printability, bulk and enhanced friction control. Furthermore, HYDREX® P silicate has excellent efficiency as TiO₂ extender for cost savings by the formulators. HYDREX® P silicate is available in dry and slurry forms.

HYDREX® P Silicate – Effects and End-Use Application

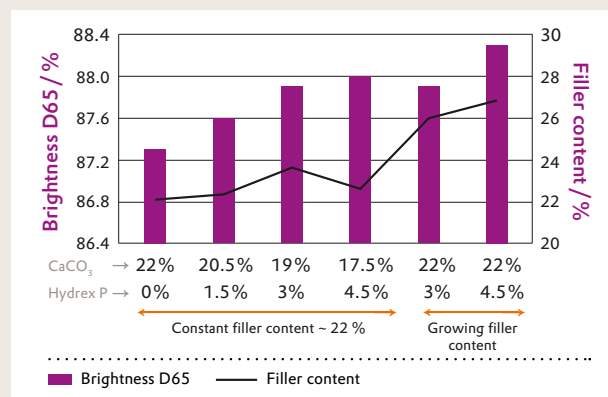
TiO ₂ extension	Cost saving in decor and thin printing paper applications
Higher opacity	Decreased need for chemical pulp in speciality fine papers, white-top and folding box board
Higher brightness	Better visual appearance in speciality fine papers and improved newsprint
Improved print quality	Good contrast ratio and high definition in all paper grades
Reduced print-through	Prevents ink strike through in thin printing paper grades
Increased bulk	Improved stiffness in book paper, white-top and folding box board
Higher friction in winding	Perfect reeling of mechanical printing papers



HYDREX® P Silicate – Technical details:

1. Brightness

HYDREX® P Silicate brightness is close to 100% and its unique pore structure provides paper with a significant number of light scattering interfaces, boosting optical properties of paper and impart desired bluish-white shade. Typically, 1% of HYDREX® P addition increases brightness by one unit in unfilled papers. Because of improved visual appearance of paper, it is possible to reduce pulp bleaching to gain better fiber quality and strength as well as to decrease need for kraft pulp.

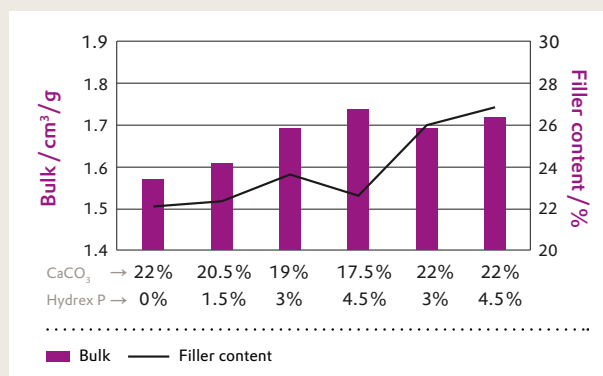


2. Printability

Light-weight, fine papers are particularly susceptible to ink strike- and print-through. Highly porous structure of HYDREX® P Silicate reduces the risk by quickly immobilizing the printing ink at the paper surface resulting in high definition print quality and a reduction in total ink demand, enabling uniform color and low level of print mottling due to even ink absorption.

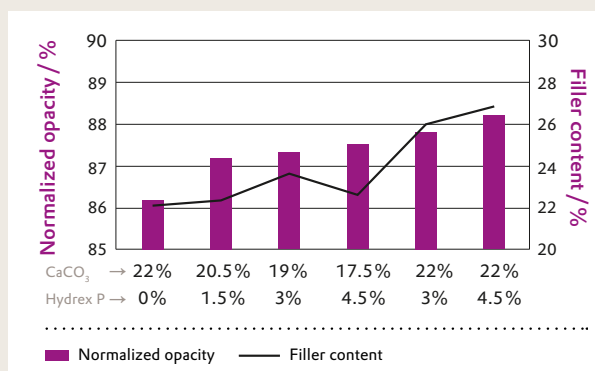
3. Opacity

HYDREX® P properties are optimized to provide both high brightness and opacity to many paper grades such as thin printing paper, tipping paper, folding boxboard and white top liner boards. Paper strength is maintained in low weight paper grades due to low HYDREX® P addition levels. HYDREX® P enables TiO₂ replacement and high quality multi color printing in thin printing paper grades and considerable cost savings through the reduced need for chemical pulp and optical brighteners.



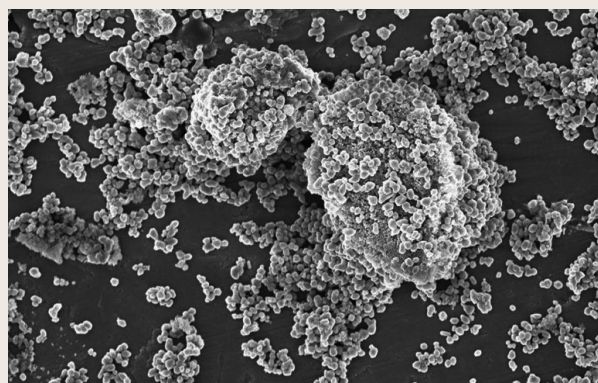
5. Titanium dioxide replacement

Excellent efficiency as TiO₂ extender is based on the optimized particle size distribution, high optical efficiency and unique internal structure. TiO₂ optical efficiency is improved by preventing its self-agglomeration tendency and optimizing inter-particle distance for light scattering. When TiO₂ is properly spaced, opacity is increased, and the appearance of the paper products is enhanced. Fixing of TiO₂ particles to the porous surface of HYDREX® P Silicate improves filler retention and gives substantial saving potential in total pigmentation cost.



4. Bulk

In contrast with common fillers (e.g. clays), HYDREX® P Silicate provides substantial bulk improvement in paper and cartonboard due to its low density, porous structure and optimized particle size distribution, which leads to better stiffness in book paper as well as improved control of paper thickness and smoothness during calendaring. Basis weight reduction is possible while maintaining paper thickness, stiffness and opacity. Gravure print quality is improved due to better contact of paper and printing plate.



This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall Evonik assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations. EVONIK EXPRESSLY DISCLAIMS ANY REPRESENTATIONS AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION AND RECOMMENDATIONS PROVIDED. Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used. Evonik reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice. HYDREX® is a registered trademark of Evonik Industries or its subsidiaries.

Evonik Resource Efficiency GmbH
Business Line Silica
Rodenbacher Chaussee 4
63457 Hanau
Germany

Phone +49 6181 59-12532
Fax +49 6181 59-712532
ask-si@evonik.com
www.evonik.com/silica