



Oral Care

Premium ingredients for oral care

Jungbunzlauer

*From nature
to ingredients®*

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High performance and multi-functionality have become key success factors for oral care products. Jungbunzlauer offers a range of ingredients that provide physiological as well as functional benefits in toothpaste, mouthwash and chewing gum products.



Stabiliser and thickener

Xanthan Gum

Xanthan gum is a natural polysaccharide produced by fermentation. Its exceptional characteristics make it an excellent choice for rheology control in a broad range of water-based oral care products. Compared to other thickeners xanthan gum is unique in offering high viscosity at low concentrations (figure 1).

At rest and at low shear rates, xanthan provides a high viscosity profile with a strong ability to stabilise emulsions and suspensions. The ability to prevent phase separation during storage and its stability with high salt concentration and temperature is a great benefit for extending shelf life of our customer's end products. At low concentration, xanthan gum provides excellent binding and keeps abrasives suspended in toothpastes. Yet beyond that, consumers enjoy an enhanced experience when using toothpaste formulated with xanthan gum due to its unwavering stand-up on the brush, its glossy ribbon and the sharply defined stripes. Its high shear thinning behaviour enables easy squeezing or pouring of oral care products out of their container. The reduced viscosity under shear stress also facilitates the mixing, pumping and filling of tubes or other containers and thus facilitates the processing of oral care products (figure 2).

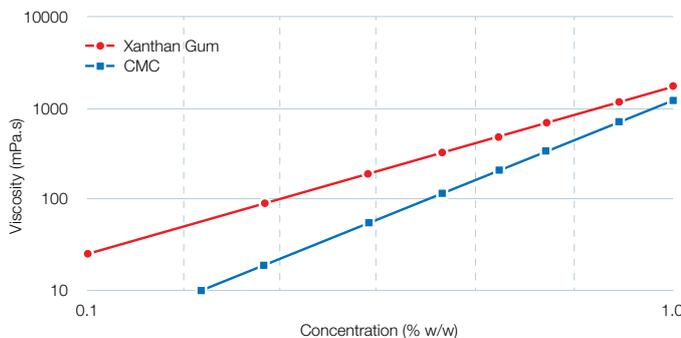


Figure 1: **Viscosity versus Concentration** in standardised tap water, Brookfield LTV, 60rpm, 25°C

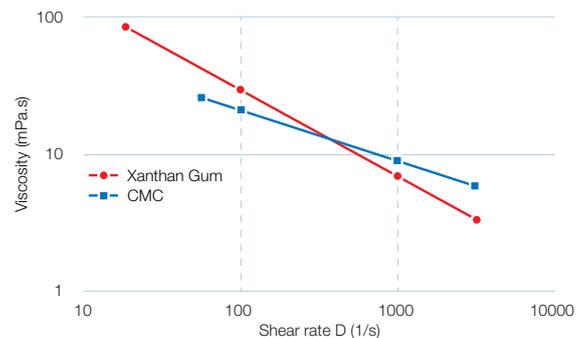


Figure 2: **Viscosity versus Shear Rate** 0.25% solutions in standardised tap water, Haake RV30-M5/NV, 25°C

For oral care applications, Jungbunzlauer offers a range of special xanthan gum oral care 'OC' grades meeting the highest quality and purity standards. Special features are the very low microbial plate counts, the absence of cellulase activity and a high degree of whiteness. The OC grades are available with different particle size distributions. Transparent oral care products can be made using the special clear solution 'CS' grades that provide all the stabilising and shear thinning properties of regular xanthan gum in products where clarity is a priority.

Grade	Characteristic	Features
XG FFOC	fine granulation (200 mesh)	Cellulase free, low microbiology, high degree of whiteness, very pure
XG FFCS-OC	transparent, fine granulation (200 mesh)	
XG FNOC	normal granulation (80 mesh)	
XG FNCS-OC	transparent, normal granulation (80 mesh)	

Sweeteners

ERYLITE® and ERYLITE® Stevia

ERYLITE® is a naturally occurring polyol and is commonly known as a well-tolerated and non-cariogenic zero calorie bulk sweetener in food and beverage applications. In toothpaste, mouthwash or chewing gum ERYLITE® works as a powerful taste enhancing agent. It adds a pleasant sweetness, actively covers bitter notes of other compounds, such as high intense sweeteners, and rounds up the overall taste profile. An additional benefit is that crystalline ERYLITE® provides a refreshing cooling effect in the mouth. Jungbunzlauer's ERYLITE® Stevia is a unique blend of ERYLITE® and Rebaudioside A, a highly pure stevia plant extract. As a natural and non-cariogenic sweetener it is ideally suited for oral care applications.

Anti-plaque and anti-microbial agents

Zinc Citrate

Zinc citrate, the zinc salt of citric acid, is frequently used in dental care products such as toothpaste, mouthwash and chewing gum due to its anti-microbial and anti-inflammatory effects and its ability to reduce or inhibit the formation of dental plaque and tartar. Recent tests have confirmed that concentrations of 0.5% zinc citrate can prevent the formation of *Streptococcus mutans* biofilms thus making it an exceptional anti-plaque agent (figure 3). Additionally, zinc citrate controls bad breath through both its anti-microbial action and the neutralisation of volatile sulphur compounds responsible for malodour.

Compared to other zinc salts, zinc citrate stands out due to its high zinc content of 31% and the lowest taste impact amongst all soluble zinc salts. Jungbunzlauer's zinc citrate is available as an ultra-fine powder for optimised mouth feeling. In applications where high solubility is required, such as clear toothpaste or mouthwash formulations, tripotassium citrate can help to increase the solubility of zinc citrate. This combination results in a less astringent composition, compared to other soluble zinc sources.

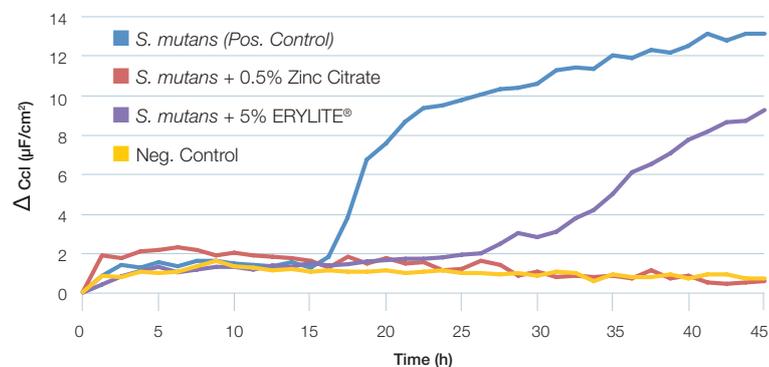


Figure 3 – Test details: CellZscope® (nanoAnalytics, Münster). Prevention of biofilm formation of *Streptococcus mutans* (DSM 20523) by 0.5% zinc citrate and 5% ERYLITE® measured via the capacitance [µF/cm²]. Media was inoculated with 10⁸ cfu/ml *S. mutans*. Control is the non-inoculated media with 0.5% zinc citrate.



ERYLITE®

ERYLITE® is a safe dental caries preventive and cariostatic agent. Proven in long-term human studies, its continuous usage leads to a significant reduction of dental plaque by inhibiting the adhesion and growth of *Streptococcus mutans* and other polysaccharide-producing streptococci. Tests have confirmed that ERYLITE® leads to delayed growth of *S. mutans* in similar range to widely used xylitol. A postponement of growth of *S. mutans* up to 20 hours for a concentration of 5% erythritol can be achieved (figure 3).

Desensitiser

Tripotassium Citrate

Tripotassium citrate is commonly used in toothpaste and mouthwash to reduce dentine hypersensitivity. Sensitive teeth are often a result of receding gums. This can lead to the necks of the teeth becoming exposed and thereby increasing vulnerability to temperature changes or sweetness. It is clinically proven that tripotassium citrate can relieve the pain of sensitive teeth due to its ability to diffuse through the exposed dentin tubules to the pulp. A calming effect is exhibited by blocking the mechanism of pain transmission between nerve cells.

Stabiliser for fluoride delivery systems

Sodium Gluconate

Sodium gluconate plays an important role as stabiliser for fluoride delivery systems in toothpaste formulations. While the anti-caries properties of toothpastes are basic requirements – which can be fulfilled by many fluoride delivery systems – a stannous fluoride system has the major advantage of also being very effective for the protection against gingivitis. However, a major drawback of the stannous fluoride delivery system is the chemical decomposition in a toothpaste formulation. Successful attempts have been made to provide a stabilised stannous fluoride delivery system. Sodium gluconate is a key component of this system – by adding sodium gluconate at higher concentrations (>2%), it reacts with stannous chloride to form stannous gluconate in situ. Stannous gluconate is the optimal stannous reservoir in the toothpaste formulation. It reacts with sodium fluoride to form stannous fluoride, which acts as the active molecule of the fluoride delivery system.

(US patent 5,004,597: The Procter & Gamble Company, priority date 14. Sept 1987)



Conformity to the natural and organic cosmetic ECOCERT and COSMOS standards



Jungbunzlauer uses clean and authorised processes to transform nature's plants into outstanding natural solutions to replace synthetic materials used in personal care formulations. However, producers and consumers are increasingly looking for credibility. The inspection of the raw materials by a neutral body on conformity to the natural and organic cosmetic standards provides transparency. ECOCERT and COSMOS approval for most Jungbunzlauer products is therefore an important benefit and assurance for all producers seeking ingredients to formulate natural personal care products.

Ethical, health or environmental concerns – we take them seriously

A continuously growing number of people choose a vegetarian or vegan lifestyle. Veganism does not stop at the edge of a plate, but covers all articles of daily use including personal care products. Producers world-wide consequently adapt their range to broaden the offerings of animal-free products. Jungbunzlauer offers naturally sourced ingredients for personal care products which are fully suitable for vegetarians and vegans.



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