

Construction

Building the Future Together

We provide our customers with differentiated solutions for their formulation needs through our leadership position in water-soluble polymers and our extensive industry knowledge.

Aqualon Products for Construction

The formulation and performance of premixed dry mortars requires the use of additives that enhance the application and functional properties of these materials. Aqualon, a business unit of Hercules Incorporated, offers a variety of products that improve the characteristics of many building products, such as tile adhesives, gypsum plasters, renders, self-leveling compounds, and masonry cements and mortars, as well as joint compounds and fillers.

Adding a small quantity of one of Aqualon's cellulose ethers or companion products may not appear to amount to much. However, they are of crucial importance to the performance of your building products. They are controlling:

- **Water retention**
- **Open time**
- **Workability**
- **Adhesion**
- **Stabilization**
- **Pumping**
- **Sag resistance**
- **Rheological properties**
- **Strength**

In addition, Aqualon products are also improving the appearance of the final products.

Aqualon is a major producer and supplier of cellulose ethers and companion products for the construction industry. Worldwide, Aqualon has offices, production facilities, laboratories, and specialized sales representatives dedicated to the construction industry.

Application specialists are working in our laboratories in China, Germany, Mexico, Russia, Singapore, and the United States. They support new product development, give technical assistance and advice to our customers, and have state-of-the-art analytical and testing equipment at their disposal.

Our Toolbox

Our "toolbox" consists of a variety of products that work together with our cellulose ethers to provide you with the best performance. Most of these additives continue to enhance what Aqualon products do best: control the rheology of your building products. Our toolbox includes a variety of companion products, like starch ethers, air-entraining agents, and defoamers that improve the performance of building materials.



Improving existing technology and products and detecting market trends and translating them into the next generation of additives are an ongoing effort at Aqualon. With the toolbox concept and products, we have many options at our fingertips, so we can provide you with the best solutions today and develop better solutions for tomorrow.

Aqualon's product range consists of cellulose ethers and companion products. The primary group of cellulose ethers includes:

- **Culminal® and Combizell® methylcellulose derivatives** help building materials apply more easily and perform better. Both products provide water retention and cohesiveness to mixtures. They are also used to control thickening, water demand, workability, sag resistance, strength, and other important properties of the final product.
- **Natrosol® hydroxyethylcellulose** is highly recommended for paste products such as latex-based plasters, wall putties and tile adhesives (mastics). High viscosity Natrosol grades provide good thickening properties in aqueous systems. They are also providing water retention and increasing the cohesiveness of mixtures. Low viscosity grades are often used as stabilizers in self-leveling compounds based on cement or gypsum.
- **Nexton® specialty water-soluble polymers** are a family of nonionic additives. Their unique chemistries provide distinctive textures in cement, gypsum and latex-based products improving workability, cohesiveness and appearance of the building material. Nexton products have been developed specifically for masonry systems, tape joint compounds, gypsum plasters and renders.

Next to cellulose ethers, many construction materials require additional fine-tuning with other specialty products including starch ethers, air-entraining agents, wetting agents, defoamers, retarders, water repellants, and superplasticizers. Our product line includes many materials that complement the performance of our cellulose ethers to help you optimize your formulations according to your needs and your customers' needs.

The group of companion products include:

- **Silipon® air-entraining and wetting agents** comprising a family of products of different chemistries. These products produce a defined amount of homogeneously distributed microscopic air bubbles in building mortars. This reduces the density of the wet mortars and improves workability. In addition, the small air void system can improve freeze-thaw durability while minimally influencing the compressive strength.
- **Silipur® functional additives** provide specific additional performance. One example is our Silipur RE range of powder defoamers, which are very effective in removing entrapped air in building products when the air content must be minimized. This is especially important for self-leveling compounds based on cement or anhydrite gypsum that require a smooth surface appearance.
- **Amylotex® and ST starch ethers** enhance workability and improve the application properties of building products. They are recommended to fine-tune the antisagging properties of dry mortars such as tile cements, plasters and renders and to increase the yield and water demand of these systems.



Applications

Dry mortars and other construction products cannot perform efficiently without Aqualon products. They play a very important role in many applications and give the finished products the desired properties. Some applications are:

Tile Adhesives

Tile adhesives are used for fixing tiles on various substrates. Dispersion-based tile adhesives, or mastics, are pasty, ready-to-use products. They are easy to use since no further mixing is required. Tile cements, on the other hand, are dry products based on cement as a binder and need water to be added prior to application. Culminal® methylcellulose derivatives improve the properties of tile adhesives, whether it is a basic formulation or a tile adhesive with specific additional properties.

Gypsum Plasters

Gypsum plasters are preblended building formulations based on different types of gypsum, aggregates and functional additives. Used for indoor application, gypsum plasters are applied onto various substrates to give smooth, protective, decorative and partly insulating layers. Gypsum plasters can be hand or machine applied. Machine applied plasters require a well-balanced rheology for easy mixing, good pumpability, good wet adhesion, high sag resistance as well as good workability.

Also, a lump-free application is mandatory. Low concentrations of additives are necessary in gypsum plasters to meet today's requirements in terms of application performance, pumping characteristics, workability and final product quality.

Renderers

Renderers are cement-based systems that are applied onto various substrates (e.g. bricks, concrete, or light weight blocks) to give a protective, decorative, and partly-insulating layer. Different render and stucco types are manufactured worldwide. They differ in binder type, binder content, particle size distribution, application methods, application thickness, color, and other parameters. There are significant differences among various

geographical regions and countries depending on the raw materials available and the building technology used.

Choosing the right render formulation depends on the application and the end-user requirements. Renderers can be pre-mixed (dry mortar) or mixed at the job-site (traditional rendering). They can either be hand or machine applied. Machine applied renderers require a well-balanced rheology for easy mixing, good pumpability, good wet adhesion, high sag resistance as well as good workability.

Self-Leveling Compounds

Self-leveling compounds can either be gypsum or cement based. When mixed with water in the right ratio, self-leveling compounds have a liquid appearance and spread without external force when applied over a large area. Gypsum-based systems (anhydrite floor screeds) use an (soluble) anhydrite gypsum phase as a binder. Cement-based products can contain Portland cement and/or calcium aluminate cement.

Masonry Cements and Mortars

Masonry mortars are factory-blended dry mortars, which only have to be mixed with water before they are used for bricklaying. They already contain the right ratio of binder and aggregates and also often contain additives like cellulose ethers and/or air-entraining agents to control the wet mortar and final product properties. Simple masonry mortars can be manufactured by just blending cement and aggregates. If the product has to meet certain minimum requirements like compressive strength, water retention, consistency and/or air content, or show proper wet mortar stability and good workability, the use of additives like water retention agents, wetting agents and/or air-entraining agents is mandatory.

Joint Compounds and Fillers

Joint compounds and fillers are applied to fill the joints between abutting wallboard sheets. They are either latex-based, available as aqueous, ready-to-use suspensions, or, as gypsum-based dry powders that are to be mixed on site. The ready-mix varieties include taping, topping and all-purpose grades, available in lightweight (7 – 8 ppg, pounds per gallon) and regular weight (13 – 14 ppg) grades. Other variations in weight and grade are more recent developments. A variety of Nexton® and Culminal® products are designed to enhance the positive effects and diminish the negative effects of the minerals and other ingredients. This is accomplished by control of the physical/chemical properties of the CE and the interactions of the CE with the other ingredients.

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Functional Properties

By adding only a minor amount of Aqualon products, the properties of your products can improve significantly and performing substantially better. The most important functional properties are:

Thickening

Culminal® methylcellulose derivatives and Natrosol® hydroxyethylcellulose are highly effective thickeners, significantly increasing the viscosity of building materials. Depending on the desired characteristics, formulation variables, use levels and application segments, climate conditions, concentrations of 0.1% up to 0.6% are sufficient to produce high viscosity and well-balanced rheological properties of the finished products.

Water Retention

Cellulose ethers have a high water retention capability, that is, the ability to physically bind large amounts of water. This water is needed by cement and gypsum based applications for proper setting and higher strength. How much water retention is needed strongly depends on the climatic conditions.

Sag Resistance

Stand-up properties are very important for wall tiling. For visual reasons, certain areas are tiled from top to bottom and require well-adjusted anti-sagging properties. With the right grade and concentration of Culminal cellulose ethers, even heavy tiles with 50 kg/sqm can be applied to walls from top to bottom without sagging.

Gypsum and cement-based plasters are sometimes applied to thicknesses above 1 inch (2.54 cm). For these plaster formulations, it is essential that sufficient anti-sagging properties are guaranteed. By choosing the right Culminal product, you can adjust the anti-sagging properties to the desired level. For fine-tuning the sag resistance, the addition of starch ethers, like Amylotex® starch ether* or ST products in all applications is recommended.

Workability and Consistency

Workability and consistency are closely linked. Plasterers expect to work with materials that are easy to level and finish. Additives like cellulose ethers, starch ethers and air-entraining agents significantly improve the leveling and finishing properties as well as the consistency of the product.

Adhesion

One of the most important properties of construction products is adhesion. Without adhesion it is simply impossible to rely on plasters, renders and tiles. Culminal® and Nexton® water-soluble polymers increase the adhesive strength of plasters and mortars so that optimal adhesion properties are obtained.

Other Functional Properties

The added value of Aqualon products, especially in tile cements, is the improvement of the yield and water demand, open time, correction time, and tensile strength. In addition, Aqualon products are also improving the mixing properties, and air entrainment and pumpability of gypsum plasters and renders, as well as the mixing properties of tile adhesives and masonry cements and mortars.

With our well-equipped, specialized dry mortar application laboratory, our broad product offering and our application experts, we can assist you in finding the right solution to meet your needs.

To learn more about Aqualon, contact your sales representative or visit us online at www.aqualon.com.

Functional Properties of Aqualon Products

	Tile Cements	Gypsum Plasters	Renders	Self-Leveling Compounds	Masonry Cements and Mortars
Workability	•	•	•		•
Skin formation	•		•*		
Water retention	•	•	•		•
Adhesion	•	•	•		•
Adjustability	•				
Air entrainment		•	•		•
Body	•	•	•		•
Mixing properties	•	•	•		•
Pumpability		•	•		
Sag resistance	•		•		•
Stabilization				•	
Strength	•	•	•		•
Tensile strength	•		•*		
Thickening	•	•	•		•
Water demand	•	•	•		
Wet Track	•	•	•		•

*Exterior Insulation Finishing Systems



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