

Product Data

NUMBER 4176-4
(Supersedes 4176-3)

AQUALON® Ethylcellulose*

AQUALON® ethylcellulose (EC) is the non-ionic ethyl ether of cellulose, soluble in a wide range of organic solvents. Typically, ethylcellulose is used as a non-swellable, insoluble component in matrix or coating systems. When water-soluble binders cannot be used in dosage processing because of water sensitivity of the active ingredient, ethylcellulose is often chosen.

Ethylcellulose can be used to coat one or more active ingredients of a tablet to prevent them from reacting with other materials or with one another. It can prevent discoloration of easily oxidizable substances such as ascorbic acid, allowing granulations for easily compressed tablets and other dosage forms. Ethylcellulose can be used on its own or in combination with water-soluble polymers to prepare sustained release film coatings that are frequently used for the coating of micro-particles, pellets and tablets.

Improved Compressible Grade: Aqualon® T10 Pharm EC

With innovative polymer engineering, Aqualon has designed a new grade of ethylcellulose, Aqualon® T10 Pharm EC, with optimized compactibility and powder flow, and low moisture absorption. High ethoxyl content and low viscosity provides improved compaction, without the need for reduction in particle size via micronization. (Low viscosity corresponds to low molecular weight polymer, when dissolved in test solvent.) Detailed studies have included physical, thermal and mechanical characterizations along with powder flow, compaction simulation and molecular modeling. (Reference A).

*Ethylcellulose is not permitted as a food additive for the European Union.

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Physical and Chemical Properties

- Non-ionic, pH insensitive cellulose ether
- Soluble in many polar organic solvents; insoluble in water
- Tough, yet ductile thermoplastic polymer for compression molding or extrusion
- Film forming, yielding flexible films over a wide range of temperatures
- Available in a wide range of viscosities and two ethoxyl contents:

Type	Viscosity, cps (5% solution of 80/20 mixture of toluene/ethanol)
<i>High Ethoxyl Substitution:</i> 49.6-51.0%	
T10	8-11
<i>Standard Ethoxyl Substitution:</i> 48.0-49.5%	
N7	6-8
N10	8-11
N14	12-16
N22	18-24
N50	40-52
N100	80-105

Typical Properties

Ethoxyl, %	by grade, as above
Viscosity, cps	by grade, as above
Residue on ignition, as Na ₂ SO ₄ , %, max	0.5
Chlorides, as NaCl, %, max	0.10
EP Acidity/Alkalinity	pass
Heavy Metals, ppm, max	20
Lead, ppm, max	3
Loss on Drying, as Packaged, %, max	3

Common Applications

Microencapsulation

- Stabilize against active interactions, hydrolysis and oxidation and/or retard release of active ingredients

Flavor Masking

- Improved taste through suppression of strong flavors or bitter tasting actives, minimizing the need for added flavoring agents.

Tablet Binder

- Plastic flow, suitable for direct compression, injection molding and melt extrusion

Modified Release Direct Compression Tablets

- Aqualon® T10 Pharm EC can be readily incorporated in stronger direct compression controlled release matrices with greater compactibility, eliminating the need for solvents. References A and B detail the resulting improvement in crushing strength and retardation of drug release with this improved grade of EC.

Tablet Coating

- Impart sustained release to film coatings

Modified Release Compression Coating

- Aqualon® T10 Pharm EC may be used to coat tablet cores forming a non-swelling, insoluble diffusion barrier to achieve either sustained release or time-controlled, delayed release profiles. (Reference C.)

Solution Thickening

- Impart thickening for non-aqueous systems

Regulatory Status

The PHARM Grades of Aqualon® Ethylcellulose comply with the monograph requirements of the current editions of the United States Pharmacopeia/National Formulary and the European Pharmacopeia.

Additional Information

The Pharm grades of Aqualon® Ethylcellulose conform to the monograph requirements for ethylcellulose in the Food Chemicals Codex, current edition.

CASRN: 9004-57-3

CAS Name: Cellulose, ethyl ether;
Ethylcellulose

Product Safety

Read and understand the Material Safety Data Sheet (MSDS) before using this product.

Selected references on Aqualon® EC are available on the Aqualon website at www.aqualon.com or by contacting one of our worldwide offices.

Improved Compressible Grade: Aqualon® T10 Pharm EC

- A. Advanced Structure-Function Properties of Ethylcellulose: Implications For Tablet Compactibility (Aqualon Pharmaceutical Technology Report PTR-21)
- B. Ethylcellulose In Direct Compression Modified Release Tablets: Impact of Polymer Structure and Formulation Variables (Aqualon Pharmaceutical Technology Report PTR-23)
- C. Ethylcellulose In Compression Coated Tablets: Implications For Time-Controlled Pulsed-Release Dosage Forms (Aqualon Pharmaceutical Technology Report PTR-22)

Flavor Masking

- D. Aqualon® Ethylcellulose For Use in Pharmaceuticals and Flavorings to Improve Their Organoleptic Properties (Aqualon Product Marketing News Bulletin M-318B)

Physical, Chemical and Microbiological Properties

- E. Aqualon® Ethylcellulose (EC) Physical and Chemical Properties (Aqualon Product Booklet 250-42A)
- F. Aqualon® Ethylcellulose—A Versatile Film-Forming Cellulose Ether (Aqualon Product Data Bulletin 452-7)
- G. Aqualon® Ethylcellulose—Microbiological Information (Aqualon Product Data Bulletin 4150)

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