sparkling solutions for home care

product guide

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reimagining home care formulations

Changing consumer needs and the trend toward sustainable solutions are driving manufacturers of home care products to expand the capabilities of finished formulations. Today, virtually all major manufacturers are rethinking established brands or creating entirely new products to better serve consumers. Moving new innovations to market, however, may require novel chemistry, novel formulating techniques or combinations of technologies to address a host of consumer needs.

Ashland Care Specialties, a leading provider of performance polymers, encapsulation technologies, preservatives and specialty surfactants, offers global R&D and technical services to help formulators create differentiated products with exceptional efficiency and efficacy. Manufacturers with complex formulation challenges or a need to create differentiated attributes work with Ashland in all phases of the development process. Offering both commercial and custom technologies, Ashland supports formulators and marketers to deliver specific consumer benefits and sustainability profiles in finished formulations.

translating science to consumer-perceivable benefits

Consumers want products that make cleaning easier. Marketers want fragrances that deliver specific sensory attributes. Most want to reduce their carbon footprint, and everyone is in search of the next big technology that will change the way we look at cleaning laundry, dishes and hard surfaces.

Meeting current market demands and developing innovations to meet future consumer needs, however, is a real challenge. That is why a world-class team at Ashland is committed to supporting novel technology, new innovations and end-user needs. In making this commitment, we provide customers the optimum level of support required to commercialize new products that attract consumer attention. Investing in the technology and innovation requirements of customers, Ashland provides resources in these key areas:

- **Synthetic and natural polymer research.** Polymer synthesis scientists work with naturally derived, semi-synthetic and synthetic polymers to create one or more effects in cleaning formulations. With a highly diverse polymer technology portfolio, Ashland's synthesis experts lead projects that require unique consumer benefits in addition to traditional functionality. Scientists work directly with formulators, applications experts and consumer scientists who require novel performance and functionality with commercial polymers or polymer hybrids specifically designed to impart a range of performance attributes in new products.
- **Project-specific technical service.** When a polymer, encapsulant, soil release technology, anti-soil redeposition agent or other technology is identified as a potential formulation solution, Ashland's technical service team helps formulators and marketers realize those benefits in customer- specific formulations.
- **Formulation support.** Making starter formulations perform as intended is the task of Ashland's specialists. Expert chemists support product development to provide the most efficient formulating solutions containing Ashland technologies.
- **Consumer science support.** Consumer science is about connecting and translating laboratory findings to consumer-perceivable benefits. Ashland's consumer science team works closely with customers to achieve product innovations.

global capabilities

Primary laboratories in the Americas, Europe, Asia, and the Middle East support global and local needs

Polymer synthesis experts create new technologies and understand structure-function relationships

Technical service experts help formulators create new/improved end-product benefits

Cleaning product formulation specialists translate benefits to starter formulations

Consumer science experts identify where and how these benefits may be leveraged in the marketplace

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formulation solutions from Ashland

Did you know Ashland is a leading supplier of commercial technologies that solve some of the most complex formulation challenges in laundry, dishwashing and hard surface cleaning applications? These technologies address an ongoing need to improve soil removal from various substrates and hold it in suspension, as well as emerging needs such as lending protective properties to clothes, surfaces and dishes. Ashland's recent formulation solutions include:

Solutions in laundry care

- improved product sustainability profiles with efficient cold-water cleaning
- improved color protection of clothes during cleaning
- anti-redeposition of soil for better cleaning
- encapsulation of ingredients in formulation such as fragrances and actives
- rheology modification of liquid laundry care products for improved consumer experience

Solutions in dishwashing

- superior auto dish cleaning performance without phosphates
- improved mineral scale prevention to reduce spotting
- more effective disintegration of tablets and solids
- encapsulation of ingredients for actives delivery or visual cues
- reduced surfactant level resulting milder and affordable hand dish wash solutions
- improved foam and cleansing properties
- rheology modifiers for dish care

Solutions in hard surface cleaning

- improved wetting on ceramic, wood, steel and glass surfaces
- soil release technologies to prevent permanent soiling on surfaces
- comprehensive rheology modifier portfolio for a wide range of formulations
- improved foam and rheology

lending sustainability to formulations with improved performance

While some in the cleaning product industry know Ashland for its proven technologies and others know Ashland for its ability to translate chemistry into consumer-desirable benefits, the future of cleaning is linked to sustainable solutions. Every sustainable cleaning project will have its own requirements, but all of them will at one point address the trend toward energy efficiency and effective cleaning with a minimum of ingredients.

Under these circumstances, polymer-based technologies will become an increasingly vital component of sustainable cleaning products. A range of polymer technologies lends performance attributes to formulations at very low use levels, providing the means to improve the efficiency of today's formulations. Hybrid polymers, another area of consideration, are conceived as a way to strike a balance in a new generation of formulations that requires biodegradation, formulation efficiency and higher performance.

Ashland, in addition, will look at sustainable solutions from a functional perspective. Just as certain polymers may be tailored for specific effects in formulation, these technologies may be engineered to reduce laundry drying time, reduce water requirements in various cleaning applications and extend the interval of cleaning schedules.

introduction to Ashland home care technology portfolio

Ashland Home Care invites formulators of household products to reimagine and re-create ground-breaking innovations or entirely new categories of products with commercial and custom technologies.

	Dishwashing	Fabric Care	Hard Surface Cleaning	Industrial & Institutional Cleaning	Anti-fog Additive	Anti-scalant	Anti-soil Redeposition Agent	Chelating Agent	Dispersant	Dye Transfer Inhibitor	Flocculant	Microencapsulation Technology	Opacifier	Rheology Modifier	Rinse Aid	Soil Release Additive	Surface Shine Enhancer	Surface Wetting Agent	Tablet Binder	Tablet Disintegrant
Polymers — Synthetic																				
Chromabond™ polymer		●	●	●			●		●	●										
Disintex™ disintegrants	●	●																		●
EasySperse™ polymers	●	●	●	●		●	●		●											
Easy-Wet™ 20 wetting agent	●	●	●	●											●			●		
Gantrez™ S polymers	●		●	●	●	●		●	●											
Jaypol™ 213 polymer		●											●	●						
Polectron™ 430 (Antara™ 430) polymer		●											●							
PVP K-series	●	●	●	●			●		●	●				●			●		●	
Rapifloc™ polymer			●	●							●									
Sorez™ 100 polymer		●					●									●				
Sorez HS 205 polymer			●	●												●				
Stabileze™ QM polymer	●	●	●	●										●						
Surfadone™ wetting agents	●	●	●	●											●			●		
Polymers — Cellulosic																				
Benecel™ methyl cellulose and hydroxypropyl methylcellulose	●	●	●	●			●							●						
Bondwell™, Blanose™, Aqualon™ carboxymethylcellulose		●	●	●			●							●		●			●	
Klucel™ hydroxypropylcellulose		●	●	●			●							●						
Natrosol™ hydroxyethylcellulose	●	●	●	●			●							●						
Encapsulation Technology																				
Captivates™ encapsulates	●	●	●									●								

Polectron™ 430 (Antara™ 430) polymer

Antara 430 polymer functions as an opacifier in liquid detergents and as a film-forming polymer in waxes, polishes and synthetic starches. With a glass transition temperature of approximately 100 °C, Antara 430 polymer enables transparent, thermoplastic films that readily adhere to glass, plastics and metals. The emulsion is compatible with many polymers and surfactants.

Polectron 430 polymer (sold as Antara 430 polymer in all other regions of the world) is a white, 38–41% solids, latex produced as a graft, emulsion copolymer of polyvinylpyrrolidone and styrene in the presence of an anionic surfactant. About 90% of the particles are <0.5 micron with a maximum 25 °C viscosity of 750 cP at pH 2.0–5.0.

Antara 430 polymer is thermally and mechanically stable in the presence of a variety of ionic compounds. The viscosity is unaffected after three freeze-thaw cycles between ambient and –20 °C; the emulsion is unbroken at 25 °C after 1/2 hr at 10,000 rpm and does not coagulate upon the addition of 1% hydrochloric acid, calcium chloride, aluminum or sodium borate.

Trade Name	Chemical Description	Features and Benefits	Applications
Polectron 430 (Antara 430) polymer	PVP/Polystyrene Latex	Excellent opacifier for liquid detergent products Creamy opaque appearance Broad compatability with formulation components	Fabric Care

Chromabond™ polymer

Chromabond S-100 polymer is a vinylpyridine-based polymer that contains betaine functionalities.

Chromabond S-100 polymer is a premium dye transfer inhibitor, developed and used in color-safe laundry detergents. This polymer demonstrates superior complexing of fugitive dyes at cost-effective levels under different temperatures and surfactant environments. Its chemical structure promotes dye complexation up to 60 °C while resisting interaction with anionic surfactants. Chromabond S-100 polymer is soluble in water and water-alcohol mixtures but insoluble in most other solvents.

Trade Name	Chemical Description	Features and Benefits	Applications
Chromabond S-100 polymer	Poly (Vinylpyridine Betaine)	Act as dye transfer inhibitors and anti-soil redeposition agents Soluble in water and water-alcohol mixtures Complexes with dyes and other aromatics Prevents deposition of oil and clay-based soils on a range of fabrics	Fabric Care

Disintex™ disintegrants

Disintex disintegrants series — Disintex 75 and 200 disintegrants — are proprietary blends of polyvinyl polypyrrolidone (PVPP), cellulose and/or inert salts. They are used extensively as disintegrants in laundry and dishwashing detergent tablets because of their high swell volumes. The cross-linked PVPP homopolymers are highly hydrophilic and will rapidly absorb water on contact to swell and create internal stress points that will break up tablets.

Trade Name	Chemical Description	Features and Benefits	Applications
Disintex 75 disintegrant Disintex 200 disintegrant	Proprietary blends of Polyvinyl Polypyrrolidone (PVPP)	Excellent disintegrants for tablet-based products Swells with high hydrostatic pressure for rapid tablet break-up Rapidly dispersed, resulting in low residues Minimal effect on tablet friability	Dishwashing Fabric Care

EasySperse™ polymers

EasySperse polymers are effective dispersants of hydrophobic actives.

EasySperse polymer is based on a copolymer of the monobutyl/ethyl ester of poly (methyl vinyl ether/maleic acid) partially neutralized with sodium hydroxide. The material is supplied as a 25% aqueous solution and is an excellent film-former.

EasySperse P-20 polymer is a spray-dried, optimized composite polyvinylpyrrolidone (PVP) and methyl vinyl ether/maleic acid half ester. It offers superior stability with hydrophobic actives and excellent compatibility with formulation ingredients.

Trade Name	Chemical Description	Features and Benefits	Applications
EasySperse polymer	Copolymer of Monobutyl Ester of Poly (MVE/Maleic Acid) partially neutralized	Ideal for "difficult" ingredients in water-based systems Highly effective dispersant for enhanced anti-soil redeposition	Dishwashing Fabric Care Industrial and Institutional Cleaning
EasySperse P-20 polymer	Polyvinylpyrrolidone (PVP) and Methyl Vinyl Ether/Maleic Acid Half Ester	Offers superior stability of hydrophobic actives Effective polymeric dispersant for anti-soil redeposition Provides excellent compatibility with formulation ingredients	Dishwashing Fabric Care Household Cleaning Industrial and Institutional Cleaning

Easy-Wet™ **20** wetting agent

Easy-Wet 20 wetting agent is a proprietary super-wetting agent based on N-Octyl-2-Pyrrolidone in a convenient-to-use liquid form. Easy-Wet 20 wetting agent is a cost-effective, premium wetter/surfactant suitable for hard surface cleaning, dishwashing, fabric care and industrial and institutional applications where superior wetting and spreading performance is required.

Trade Name	Chemical Description	Features and Benefits	Applications
Easy-Wet 20 wetting agent	Patented formulation based on N-Octyl-2-Pyrrolidone	Powerful wetting at very low use levels Use on low-energy, high-energy and polyolefin substrates Dynamic and equilibrium surface tension reduction Foaming Enhanced cleaning performance Conforms to Detergent Regulation EC 648/2004	Dishwashing Fabric Care Household Cleaning Industrial and Institutional Cleaning

Gantrez™ S polymers

Gantrez polymers have repeating co-maleic acid units produced by hydrolysis of (poly methyl vinyl ether/maleic anhydride) copolymer. The range includes the Gantrez S-95 polymer, which is a methyl vinyl ether/maleic acid copolymer, and the Gantrez S-97 polymer, which is a methyl vinyl ether/maleic anhydride copolymer.

Polycarboxylic acid derivatives with a pH of ~2 at 5% concentration are available either as viscous solutions or white powders. The vicinal dicarboxylic acid functionality of these materials is useful in a number of applications. The free acid forms are water-soluble, giving clear and tacky films. Solution rheology can be modified by the addition of salts and bases.

Trade Name	Chemical Description	Features and Benefits	Applications
Gantrez S-95 polymer	Poly (Methyl Vinyl Ether/ Maleic Acid) Copolymer	○ phosphate-free auto dish ○ dispersant ○ mineral scale control	Dishwashing Industrial and Institutional Cleaning
Gantrez S-97 polymer		Can act as a anti-fog additive, dispersant and/or rheology modifier Anti-fog additive for window and glass cleaners Cold-water soluble Enhances hydrophilicity of surface Promotes long-lasting, streak-free surfaces	Household Cleaning Industrial and Institutional Cleaning

Jaypol™ polymer

Jaypol 213 polymer is a rheology modifier targeted for aqueous systems and form tangled networks of polymer chains that give structure to water, effectively inhibiting flow. Raising the viscosity with Jaypol 213 polymer will help stabilize emulsions and dispersions, or improve product handling and application attributes. Jaypol 213 polymer is a coiled polymer dispersed in oil. On dilution and stirring, this liquid-dispersion polymers (LDP) is released to form the tangled chain network. When the complexity of the polymer network is formed, its interaction with other ingredients in the solution and how the chains untangle under shear determine the rheological character imparted to the system.

Trade Name	Chemical Description	Features and Benefits	Applications
Jaypol 213	Poly(2-dimethylamino) ethyl methacrylate methyl chloride quaternary salt	Rheology Modifiers Help stabilize emulsions and dispersions Improve product handling and application attributes	Fabric Care

PVP K-series

Polyvinylpyrrolidone is a hygroscopic, amorphous polymer supplied as a white, free-flowing powder or a clear aqueous solution. Available in several molecular weight grades, they are characterized by K-value and used in various applications. Polyvinylpyrrolidone can be plasticized with water and most common organic plasticizers. It is considered to be physiologically inert.

Applications take advantage of one or more of the following properties inherent in the polymer, typically due to the lactam ring:

- high polarity and the resultant propensity to form complexes with hydrogen donors, such as phenols and carboxylic acids, as well as anionic dyes and inorganic salts
- dispersancy, where components in a mixture are uniformly distributed through the use of polyvinylpyrrolidone
- hydrophilicity, where the substantial water solubility of polyvinylpyrrolidone is its dominant feature and frequently a factor along with other properties valuable to numerous applications
- adhesion, taking advantage of the higher molecular weight polyvinylpyrrolidones formulating in aqueous media, then evaporating sufficient water to generate a solid product for the desired application
- cohesivity, where cohesive strength is achieved through a variety of dry blending and granulation techniques

Polyvinylpyrrolidone is cross-linkable to a water-insoluble, swellable material either in the course of vinylpyrrolidone polymerization, by addition of an appropriate multifunctional comonomer or by post-reaction, typically through hydrogen abstraction chemistry.

Trade Name	Chemical Description	Features and Benefits	Applications
PVP K-series	Polyvinylpyrrolidone	Used as rheology modifiers in liquid dishwashing formulation Compatible in clear liquid, heavy duty detergents Excellent binder for tablet formulations Stabilize emulsions and structure liquid products	Dishwashing
		Used as anti-soil redeposition agents, dye transfer inhibitors, rheology modifiers, and/or tablet binders Soluble in water and many organic solvents Provides dye transfer inhibitor by complexing with dyes Provides anti-soil redeposition, enzyme stabilization Clay-based soils on range of fabrics Provides enzyme stabilization Compatible in clear liquid, heavy duty detergents Stabilize emulsions and structure liquid products Excellent binder for tablet formulations Binder and protective coating for enzymes	Fabric Care
		Used as rheology modifiers and/or surface shine enhancers Compatible in clear liquid, heavy duty detergents Stabilize emulsions and structure liquid products Nonionic Newtonian rheology Surface shine enhancement in cleaning products Forms hard, transport, glossy films	Household Cleaning
		Used as dispersants and/or rheology modifiers Uniformly distributes components in a mixture Compatible in clear liquid, heavy duty cleaners Stabilize emulsions and structure liquid products Nonionic Newtonian rheology	Industrial and Institutional Cleaning

Rapifloc™ N-10008 polymer

Rapifloc polymer is a high molecular weight polyacrylamide used as a flocculation aid in water treatment and water clarification.

Trade Name	Chemical Description	Features and Benefits	Applications
Rapifloc N-10008	Polyacrylamide	Used as a settling agent for hard surface cleaners Excellent flocculation of particulates and oils Film-forming polymer with high surface area	Household Cleaning Industrial and Institutional Cleaning

Sorez™ 100 polymer

Sorez 100 polymer is a modified polyester copolymer concentrate in water-soluble form. The product imparts wicking properties to hydrophobic textiles. It provides soil release and anti-redeposition properties while reducing the electrostatic charge of treated polyester. Sorez 100 polymer can be used in laundry detergents, fabric softeners and pre- and post-wash stain removers. The polymer forms a thin film on the substrate, enabling effective soil removal during subsequent wash cycles.

Trade Name	Chemical Description	Features and Benefits	Applications
Sorez 100 polymer	Polyethylene Glycol Polyester Copolymer	Soil release property on cotton-blend and synthetic fabric Anti-soil redeposition properties for synthetic and cotton-blend Broad compatibility with all surfactant types Miscible with cold water at any ratio Prevents deposition of oil-based soils on range of fabrics	Fabric Care

Sorez™ HS 205 polymer

Sorez HS 205 polymer can help deliver four sought-after benefits in hard surface cleaning products: soil release, soil repellency, anti-scale performance and hydrophilization. At the recommended use levels of 0.5% to 1.5%, Sorez HS 205 polymer is substantive to negatively charged surfaces, reducing the ability of the soil to stay in place and allowing for easier cleaning. Sorez HS 205 polymer offers a water "sheeting" effect, reducing the amount of energy required in the use of hard surface cleaner formulations. In the bathroom and the kitchen, surfaces cleaned with Sorez HS 205 polymer stay cleaner, longer – even after repeated soiling and rinsing phases.

Trade Name	Chemical Description	Features and Benefits	Applications
Sorez HS 205 polymer	Vinylpyrrolidone/Dimethylaminoethyl Methacrylate Copolymer	Highly efficient soil release Effective soil repellency Inhibits scale formation Hydrophilization Reduced cleaning time Surfaces stay cleaner for longer Excellent for oily soils Works in anionic and nonionic formulas Less spotting and streaking	Household Cleaning Industrial and Institutional Cleaning

Surfadone™ wetting agents

Surfadone wetting agents are linear, N-Alkyl-2-Pyrrolidones. They combine the hydrophilic, dipolar pyrrolidone ring with a hydrophobic alkyl group and exhibit a unique combination of solvency and surface activity. They are hydrophobic in nature, functioning as excellent wetting agents and effective dispersing and cleaning aids.

Surfadone LP-100 wetting agent (N-Octyl-2-Pyrrolidone) is a low-foaming, nonionic rapid wetting agent with an HLB of 6 and having no critical micelle concentration (CMC). Due to the electron delocalized lactam ring, Surfadone LP-100 wetting agent interacts with anionic surfactant micelles. This greatly enhances its water solubility, resulting in synergistic surface tension reduction and wetting enhancement at low concentrations.

Surfadone LP-300 wetting agent (N-Dodecyl-2-Pyrrolidone) is sparingly soluble in water (0.002 weight percent) and soluble in most organic solvents. It is a low-foaming, nonionic surfactant with an HLB of 3 and has no critical micelle concentration (CMC). Like its lower homolog, Surfadone LP-300 wetting agent interacts with anionic surfactants, forming mixed micelles, which greatly enhances its solubility, resulting in synergistic surface tension reduction and wetting enhancement. Appropriate combinations of Surfadone LP-300 wetting agent and anionic surfactants produce viscous solutions and gels.

Key Features:

- powerful surface tension reduction at low levels
- synergistic performance with anionics or nonionics
- powerful wetting
- non-foaming
- conform to Detergent Regulation EC 648/2004
- listed on CleanGredient US EPA Design for Environment

Trade Name	Chemical Description	Features and Benefits	Applications
Surfadone LP-100 wetting agent	N-Octyl-2-Pyrrolidone	Used as a rinse aid Reduces drying time Acts as a protein soil defoamer Provides rapid/effective wetting and low foam Exhibits minimal filming and spotting	Dishwashing
		Provides rapid/effective wetting Facilitates the removal of oily soil and grease stains from cotton, polyester and cotton-polyester fabrics	Fabric Care
		Biodegradable, performance-enhancing co-surfactants and coupling solvents Used in institutional/household kitchen, bathroom, glass, and all-purpose cleaners Dynamic surface activity promotes rapid wetting, penetration and softening of oily/greasy soils, soap scum and mineral scale, to facilitate removal from a variety of substrates Surfadone LP-100 wetting agent minimizes streaking on glass	Household Cleaning
		Provides high surface activity and wetting Combines broad-spectrum solvent capability with favorable safety features Safer alternative to hazardous solvents and provides solvency for a wide range of organic materials and resins In aqueous metal cleaners, 1%–2% Surfadone LP-100 wetting agent facilitates cleaning performance and interacts with alkoxylated thiol surfactants to minimize odor	Industrial and Institutional Cleaning
Surfadone LP-300 wetting agent	N-Dodecyl-2-Pyrrolidone	Biodegradable, performance-enhancing co-surfactants and coupling solvents Used in institutional/household kitchen, bathroom, glass, and all-purpose cleaners Dynamic surface activity promotes rapid wetting, penetration and softening of oily/greasy soils, soap scum and mineral scale to facilitate removal from a variety of substrates Particularly effective as a coupling solvent for fragrances	Household Cleaning
		Provides high surface activity and wetting Combines broad-spectrum solvent capability with favorable safety features Safer alternatives to hazardous solvents and provide solvency for a wide range of organic materials and resins	Industrial and Institutional Cleaning

Stabileze™ QM polymer

Stabileze QM polymer, a poly (methyl vinyl ether/maleic anhydride decadiene) crosspolymer, is a pseudoplastic rheology modifier that yields clear, aqueous gels that are shear-thinning. The resulting gels have good shear, temperature and UV-A radiation stability. The polymer is a white, free-flowing powder with a glass transition temperature of approximately 150 °C. The solid can be dispersed in water without coagulating, and the anhydride function will hydrolyze directly or through the action of base. A neutralized 0.5% solution in water at pH 7 and 25 °C has a viscosity range of 45,000–70,000 cP.

Trade Name	Chemical Description	Features and Benefits	Applications
Stabileze QM polymer	Poly (Methyl Vinyl Ether/Maleic Anhydride Decadiene) Crosspolymer	Readily hydrolyzed and neutralized to form gels Water-clear for strong visual impact Readily shear thinning for pumping/ pouring/spraying High yield values for suspension Capable of emulsifying hydrophobic materials	Dishwashing Fabric Care Household Cleaning Industrial and Institutional Cleaning

polymers — cellulosic

Benecel™ methylcellulose and hydroxypropyl methylcellulose

Benecel methylcellulose (MC) and its derivatives are made by reacting alkali-cellulose with methyl chloride (resulting and methylcellulose, MC) and ethylene oxide (resulting in methyl hydroxyethylcellulose, MHEC) or propylene oxide (resulting in methyl hydroxypropylcellulose, MHPC) under rigidly controlled conditions.

Trade Name	Chemical Description	Features and Benefits	Applications
Benecel MC	Methylcellulose	Water retention Quality of solution Gel strength Cold-water solubility Solubility in organic solvents Rheology control/thickening/stabilizing effect	Fabric Care Household Cleaning Industrial and Institutional Cleaning
Benecel HPMC	Hydroxypropyl methylcellulose	Rheology control/thickening/stabilizing Foam boosting Mildness	Fabric Care Household Cleaning Industrial and Institutional Cleaning Hand Dish Wash Hand Sanitizers

Bondwell™, Blanose™, Aqualon™ carboxymethylcellulose

CMC is a cellulose ether, produced by reacting alkali cellulose with sodium monochloroacetate under controlled conditions. It is an anionic, water-soluble polymer. Specific grades of this range can be used as rheology modifiers in fabric care and household cleaning applications.

Trade Name	Chemical Description	Features and Benefits	Applications
Bondwell, Blanose, Aqualon CMC	Carboxymethylcellulose	Cold-water solubility Rheology control/thickening/stabilizing effect Anti-redeposition property	Fabric Care Household Cleaning Industrial and Institutional Cleaning Air Fresheners

Klucel™ hydroxypropylcellulose

Klucel hydroxypropyl cellulose (HPC) is a nonionic water-soluble cellulose ether with unique combination of properties, soluble in cold-water and polar organic solvents, surface active, forms films of exceptional flexibility without addition of plasticizers.

Trade Name	Chemical Description	Features and Benefits	Applications
Klucel HPC	Hydroxypropylcellulose	Film-former Cold-water solubility Rheology control/thickening/stabilizing effect Anhydrous formulations	Fabric Care Household Cleaning Industrial and Institutional Cleaning Hand Sanitizers

Natrosol™ hydroxyethylcellulose

Natrosol hydroxyethylcellulose (HEC), a nonionic, water-soluble polymer is a white, free-flowing granular powder. Solutions of Natrosol HEC are pseudoplastic and shear-thinning. Natrosol HEC is easily dissolved in cold or hot water to give crystal-clear solutions of varying viscosities. Furthermore, low to medium molecular weight types are fully soluble in glycerol and have good solubility in hydro-alcoholic systems containing up to 60 percent ethanol. Natrosol HEC is generally insoluble in organic solvents.

Trade Name	Chemical Description	Features and Benefits	Applications
Natrosol HEC	Hydroxyethylcellulose	Film-former Cold-water solubility Rheology control/thickening/stabilizing effect R-types easy to disperse Anti-redeposition property Crystal clear formulations Salt tolerant	Fabric Care Household Cleaning Industrial and Institutional Cleaning

encapsulation technology

Captivates™ encapsulates

Captivates™ A

Captivates™ A are core/shell microcapsules specifically designed for the encapsulation and delivery of fragrances into home care applications. Captivates™ A are made using a novel fragrance encapsulation process that utilizes acrylate chemistry. Where alternative fragrance encapsulation processes use formaldehyde or isocyanates to cross-link the polymer shells, neither are utilized in the process of making Captivates™ A.

Produced in the size range of 5–25 microns, Captivates™ A show outstanding performance in terms of fragrance capture and long term release. They are available with a range of portfolio fragrances, but can also be customized in terms of fragrance type, shell strength and release profile.

Captivates™ GL

Captivates GL are encapsulates containing a matrix structure, produced using JetCutter™ Technology — rotating cutting wires that create hydrogel beads from a continuous jet of viscous fluid. The resulting droplets are transformed into solidified beads through various gelation techniques including thermal gelation and ion exchange — producing a uniform bead matrix that can contain high levels of encapsulated material. Naturally derived materials such as agar, gellan gum, alginate and carrageenan are used as the matrix material.

Captivates GL are produced in sizes ranging from 250 µm to 3000 µm in diameter and can be used to encapsulate a wide range of materials including oils, pigments, abrasives and harmless bacteria. Delivery triggers include dilution, pressure and pH.

Captivates™ HC

Captivates HC are core/shell microcapsules produced via complex coacervation using naturally derived gelatin and acacia (Gum Arabic) as the principal wall materials; they range from 15 µm to 2000 µm in diameter. Captivates HC with a minimum diameter above 250 µm can be used in otherwise clear or homogeneously opaque carriers to provide a striking visual impact while delivering actives or other ingredients with beneficial properties.

Smaller microcapsules in the 15 µm to 50 µm range and can be used to deliver fragrances or other lipophilic active ingredients onto substrates such as fabrics or hard surfaces. The optimization of size, core content and wall structure allows the properties of the microcapsules to be controlled and used in a wide range of formulations.

Trade Name	Chemical Description	Features and Benefits	Applications
Captivates™ A	Captivates™ A are core/shell microcapsules produced in sizes ranging from 5–25 microns	Encapsulation of fragrances Excellent long term stability and performance High temperature stability Customized properties Non-formaldehyde process	Dishwashing Fabric Care Household Cleaning
Captivates™ GL	Captivates™ GL are custom-manufactured spherical particles produced in sizes ranging from 250 µm to 3000 µm	Creative sensory experience Naturally derived Formulation creativity High payloads of lipophilic and insoluble actives Protection and delivery of sensitive ingredients Targeted delivery and deposition pH, dilution and shear triggering Visual differentiation	
Captivates™ HC	Captivates™ HC are custom-manufactured microcapsules produced in sizes ranging from 5 µm to 2000 µm		

committed to your formulation

At Ashland, our commitment to the household consumer product formulator goes beyond our commercial and custom technology portfolio. It includes an active R&D program on four continents to better support regional formulation objectives. Ask us how we better serve manufacturers with a technical team that serves all phases of your product development cycle. Ashland is ready to help you succeed in any market around the world.

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