HEALTH CARE

EVONIK
Leading Beyond Chemistry

Evonik Health Care partners with the world's pharmaceutical, medical device and nutraceutical companies to transform complexity into value. Our core competencies allow us to specialize where you need us most, ensuring access to the right people, products and capabilities to streamline your path to market and elevate your commercial performance.

- **> 1.000** customers across more than **100** countries
- **60 years** of industry leadership across multiple markets
- **> 50** highly specialized core competencies
- **90%** of the top pharmaceutical companies are served
- **> 6** acquisitions since **2010**
- **10** productions sites
- **14** labs
- **> 20** sales ofiices

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HEALTH CARE APPLICATION LAB AT ATC

The Evonik Applied Technology Center (ATC) was designed to develop, together with our business partners, cutting-edge technologies for key markets such as: agro, animal nutrition, construction, epoxy-based products, home care, paints, personal care, pharmaceutical, polyurethanes, and others. With our customers and partners, we combine knowledge and experience for a better life, today and tomorrow. The Health Care laboratory was set-up to provide our clients with innovative solutions for their everyday challenges in areas where Evonik has a unique expertise, such as multiparticulates and advanced drug delivery systems.

The ATC is located at Florindo Cibin, 7000 – Parque Liberdade – Americana/SP – Brazil, 13470-437

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HEALTH CARE APPLICATION LAB AT ATC

INFRASTRUCTURE	EQUIPMENT	MODEL	APPLICATION
Health Care Application Lab	Fluidized bed	Innojet-Hüttlin	• Particle coating • Wet granulation • Drying
	High Shear mixer	Comasa	• Wet granulation • Mixing
	Mill	Conic Miller	• Milling
	Powder blender	Turbula	• Mixing
	Tablet compressor	Riva-Piccola EU-D	• Tableting
	Coater	O'hara	• Core Coating (tablets, mini-tablets, soft capsules and hard capsules)
	Desintegrator	Ethik	• Tablet and Capsule disintegration analyzer
	Tablet dissolutor	Sotax	• Dissolution
	UV analyzer	Sotax	• Assay analyzing
	IR moisture analyzer	Radwag	• Residual moisture measuring
	Hardness analyzer	Erweka	• Tablet hardness measuring
	Friabilometer	Ethik	• Tablet friability measuring
Formulation and Application Service Team	NA		Highly specialized technical team available for • bibliographic survey and patent search • support in formulation • reformulation and troubleshooting • analysis of analytical results • scale-up • preparation of reports • support in Quality and Regulation matters

For more details about our products, please consult our sales team.

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ORAL DRUG DELIVERY SOLUTIONS

An integrated portfolio of functional excipients, delivery technologies and services to release the true value of your oral solid dosage forms. Evonik Health Care is a global strategic partner for advanced drug delivery solutions. We combine highly versatile platforms of functional excipients for oral dosage forms, with innovative technologies and best-in-class formulation development, manufacturing and regulatory services. Pharmaceutical companies worldwide leverage our distinctive products and value-adding services to enhance drug effectiveness, reduce project complexity, increase speed to market and strengthen supply security.

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ORAL DRUG DELIVERY SOLUTIONS

CATEGORY	EUDRAGIT® TYPES	GRADES	FORM	CHEMICAL NAME	SOLUBILITY/ PROPERTIES	APPLICATIONS	ADVANTAGES	PROCESS TECHNOLOGY
Immediate Release	**EUDRAGIT® E, IR**	E 100	Granules	Basic Butylated Methacrylate Copolymer	Soluble up to pH 5.0* *swellable and permeable above pH 5.0	• Glossy cosmetic coatings • Taste and odor masking, light and moisture protection • Swallowability improvement • Low viscosity • High pigment binding capac • Excellent adhesion • High effectiveness in thin coatings	• High-gloss easy to process cosmetic and functional coatings • Neutral in taste and smell to mask API bitterness or unpleasant odors • Smooth surfaces as thin as 10 – 20 µm to improve swallowability • Reliable protection and stability for APIs sensitive to light, moisture, and oxygen • Insoluble in saliva and readily soluble in the stomach for improved absorption • Custom-made, easy-to-mix powder blends for rapid suspension preparation	• Tablet coating
		E PO	Powder					
		E PO Ready-mix						
		IR Ready-mix White			Water soluble swellable and permeable above pH 5.0			
Delayed Release - Small Intestine	**EUDRAGIT® L, FL**	EUDRACAP®	Capsule	"EUDRACAP® are pre-locked hydroxypropyl methylcellulose (HPMC) hard capsules with a functional coating (facilitating a specific disintegration time)."	Customizable	• Easily combined to achieve a specific dissolution pH • Highly stable, with rapid dissolution for precise targeting • Well-defined characteristics to safeguard the gastric mucosa from aggressive actives • Able to protect the transit of APIs sensitive to gastric fluid	• A broad, easy-to-combine enteric platform to achieve a specific dissolution pH • Highly effective and stable polymers for precise targeting and rapid dissolution • Well-defined solutions to protect the gastric mucosa from aggressive actives • Strong expertise in safeguarding the transit of APIs sensitive to gastric fluid • Options to improve coating productivity and reduce process and cleaning time • Ready-to-fill coated capsules time-to-market or accelerated time-to-market"	• Encapsulation
		L 30 D-55	Aqueous dispersion	Methacrylic Acid - Ethyl Acrylate Copolymer (1:1) Dispersion 30 Per Cent	Soluble above pH 5.5			• Aqueous granulation • Pelletization • Particle • Tablet coating"
		FL 30 D-55						
		L 100-55	Powder	Methacrylic Acid - Ethyl Acrylate Copolymer (1:1) Type A				• Organic granulation • Pelletization • Hot melt Extrusion • Direct compression • Roller compaction • Tablet coating
		L 100		Methacrylic Acid - Methyl Methacrylate Copolymer (1:1)	• Soluble above pH 6.0			• Organic granulation • Pelletization • Particle • Direct compression • Roller compaction • Tablet coating
Delayed Release - Colonic Delivery	**EUDRAGIT® S, FS**	FS 30 D	Aqueous dispersion	Methyl Acrylate, Methyl Methacrylate and Methacrylic Acid (7:3:1) Copolymer 280000 Dispersion -NF	Soluble above pH 7.0			• Organic granulation • Pelletization • Particle • Direct compression • Roller compaction • Tablet coating • Pelletization • Aqueous granulation
		FS 100	Powder	Methyl Acrylate, Methyl Methacrylate and Methacrylic Acid (7:3:1) Copolymer 280000				• Organic granulation • Pelletization • Direct compression • Roller compaction • Particle • Tablet coating
		S 100		Methacrylic Acid - Methyl Methacrylate Copolymer (1:2)				
Sustained Release	**EUDRAGIT® RL, RS, NM**	RL PO	Powder	Ammonio Methacrylate Copolymer, Type A	Insoluble, high permeability, pH-independent swelling Customized release profiles by combining with EUDRAGIT® RS at different ratios"	• Multiple combination options to control delivery throughout the GI tract • Solutions for once-per-day dosing, pulsatile release, and other custom profiles • Insoluble with pH-independent permeability • Flexible options for high or low permeability	• Sustained, modulated, or custom-release profiles controlled by diffusion barriers • Multiple combination options to precisely control passage through the GIT • Proficient in daily dosage forms, including multi particulates and matrix tablets • Insoluble with pH-independent swelling and options for high or low permeability • Options to improve coating productivity and reduce process and cleaning time"	• Organic granulation • Pelletization • Hot melt Extrusion • Direct compression • Roller compaction
		RL 100	Granules					• Organic granulation • Pelletization • Hot melt Extrusion • Tablet Coating • Roller compaction
		RL 30 D	Aqueous dispersion	Ammonio Methacrylate Copolymer Dispersion, Type A				• Aqueous granulation • Pelletization • Particle • Tablet coating
		RS PO	Powder	Ammonio Methacrylate Copolymer, Type B	Insoluble, low permeability, pH-independent swelling Customized release profiles by combining with EUDRAGIT® RL at different ratios			• Organic granulation • Pelletization • Hot melt Extrusion • Direct compression • Roller compaction
		RS 100	Granules					• Organic granulation • Pelletization • Hot melt extrusion • Particle • Tablet coating
		RS 30 D	Aqueous dispersion	Ammonio Methacrylate Copolymer Dispersion, Type B				
		NM 30 D	Aqueous dispersion	Ethyl Acrylate and Methyl Methacrylate Copolymer Dispersion - NF	Insoluble, low permeability, pH-independent swelling Highly flexible, suitable as matrix formers			• Aqueous granulation • Pelletization • Particle • Tablet coating
		NM 40 D						

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ORAL DRUG DELIVERY SOLUTIONS

CATEGORY	EUDRAGIT® TYPES	GRADES	FORM	CHEMICAL NAME	SOLUBILITY / PROPERTIES	APPLICATIONS	ADVANTAGES	PROCESS TECHNOLOGY
Solubility Enhancement	Solutions for solubility enhancement of poorly water-soluble drugs	E PO	Powder	Basic Butylated Methacrylate Copolymer	Soluble up to pH 5.0* *swellable and permeable above pH 5.0"	• Highly specialized in amorphous solid dispersions (ASDs) • Strong solubilizing and recrystallization inhibiting effect • Suitable carriers for all process technologies such as spray drying, HME and top-spray granulation	• Suitable carriers for all process technologies such as spray drying, HME, and top-spray granulation • Highly specialized in amorphous solid dispersions (ASDs) • Development and manufacturing service for particle-engineered free-flowing ASDs • Predictive systems to select the best carrier excipient and process parameters • Various down streaming options to improve dosage forms and speed to market	• Tablet coating
		L 100 -55		Methacrylic Acid - Ethyl Acrylate Copolymer (1:1) Type A	Soluble above pH 5.5			• Aqueous granulation / palletization
		S 100		Methacrylic Acid - Methyl Methacrylate Copolymer (1:2)	Soluble above pH 7.0			
		L 100		Methacrylic Acid - Methyl Methacrylate Copolymer (1:1)	Soluble above pH 6.0			
		E 100	Granules	Basic Butylated Methacrylate Copolymer	Soluble up to pH 5.0* *swellable and permeable above pH 5.0"			• Tablet coating
Easy-to-use & Ready-to-use products	Ready-to-use powder blend for fast-dissolving immediate release film coatings	IR Ready-mix	Powder		Water soluble and swellable and permeable above pH 5.0	• Ready-to-use powder blend for fast-dissolving immediate-release film coatings	• Ready-to-use powder blend for fast-dissolving immediate-release film coatings	
		E PO Ready-mix			Soluble up to pH 5.0* *swellable and permeable above pH 5.0			
		PlasACRYL® HTP20	Aqueous dispersion	Not Applicable	The emulsion is miscible with water and acrylic polymer dispersion.	• Two high-performance coating system additives are for use with EUDRAGIT® polymers. • They optimize coating efficiency and reduce processing times, thereby achieving significant cost savings with no loss in quality.	• It is a coating additive that results in shorter preparation and spraying times. This significantly lowers production costs without diminishing the functionality of your final dosage form. • Can lead to an even better coating quality.	
Transdermal delivery	**EUDRAGIT® E**	E 100	Granules	Basic Butylated Methacrylate Copolymer	Soluble up to pH 5.0* *swellable and permeable above pH 5.0	• It was developed as a gastro-soluble film coating material for taste masking and protective coatings to manufacture solid oral dosage forms. • Transdermal patches have become another field of application."	• Neutral in smell to mask unpleasant odors • Smooth surfaces as thin as 10 – 20 µm to improve swallowability • Reliable protection and stability for APIs sensitive to light, moisture, and oxygen"	• Extrusion

TYPE	SUBTYPES	FORM	ADVANTAGES	PROCESS TECHNOLOGY
EUDRACAP®	**EUDRACAP®**	Capsule	• Targeted drug delivery • Protection of sensitive actives • Reduce clinical risk and accelerate time to market • Easy-to-fill, smooth and evenly coated (HPMC) capsules	Encapsulation
	EUDRACAP® preclinic			
	EUDRACAP® colon			

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ORAL DRUG DELIVERY SOLUTIONS

RELEASE THE TRUE VALUE OF YOUR ORAL SOLID DOSAGE FORMS

1

EUDRAGIT® functional polymers

The versatility and rellability to protect the API, boost drug performance and reduce formulation risk

EUDRACAP® functional ready-to-fill capsules

The fast and reliable solution to optimize the release profile of your drug, protect active ingredients, and help accelerate speed to market

2

Delivery Technologies

Differentiated solutions for modified release to enhance drug efficacy and generate superior targeting outcomes

3

Formulation Services

Best-in-class services to reduce project complexity from concept to the final dosage form to increase speed to market

4

PARTNERSHIP

Clinical and Commercial Supply

High-quality GMP clinical production, robust scale-up to commercialization through partner with on-site production support and trouble-shooting

5

Regulatory Support

Leverage the worldwide monograph status of our excipients and local market expertise for regulatory 'peace of mind'

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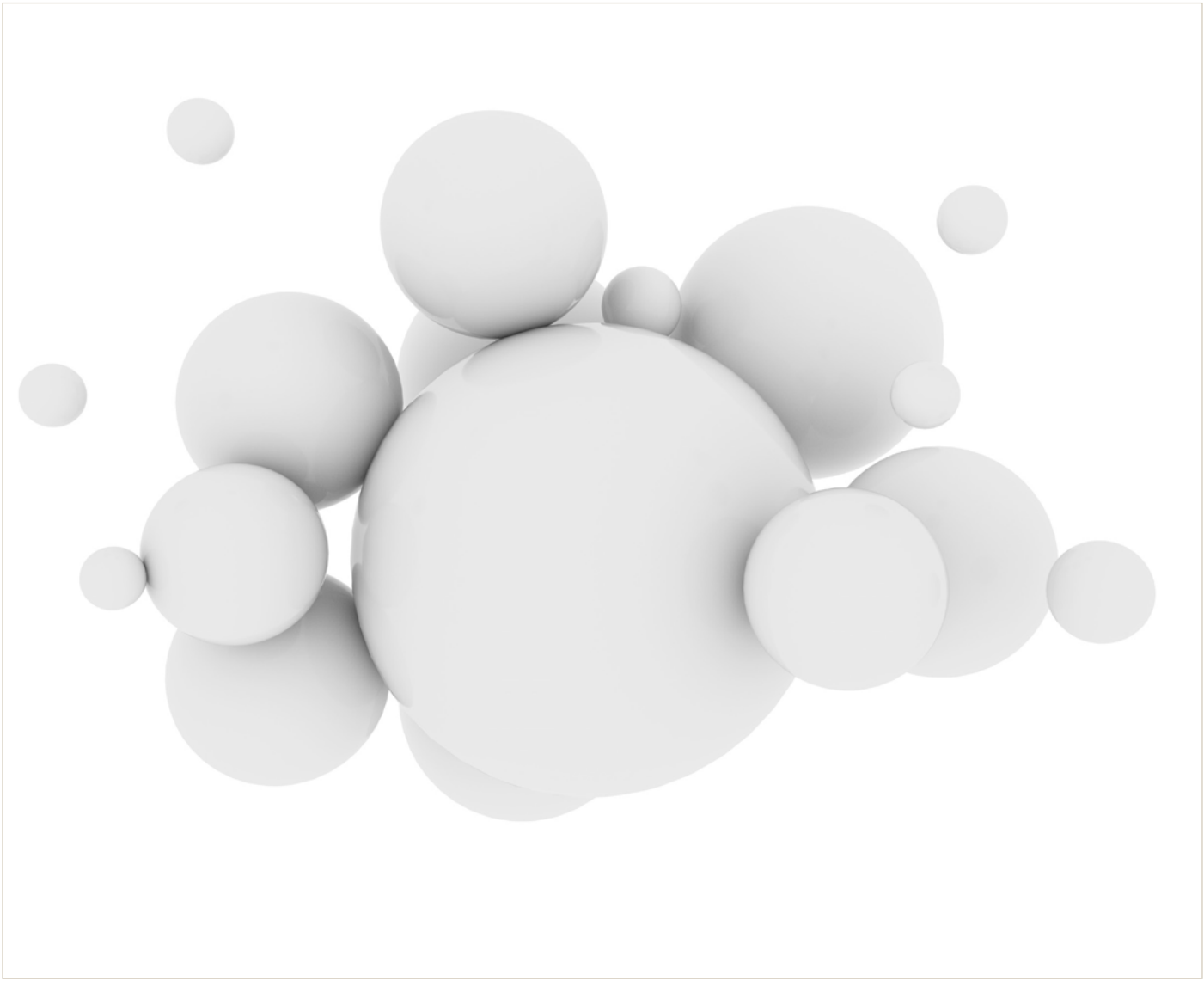
SUGAR SPHERES BY WERNER PHARM-A-SPHERES™



Due to their special manufacturing process pharm-a-spheres™ sugar spheres have a high mechanical stability. Even when coated in fluidized-bed equipment the pharm-a-spheres sugar spheres do not disintegrate and form no attrition. Also as a result of the production process the pharm-a-spheres™ sugar spheres show a high degree of sphericity. Even the small-sized microspheres have a non-porous, smooth, and spherical surface. This is important for a precise layering with API and reproducible release of the final pellet. The particle size is often a critical parameter in the customer's coating process. Werner is specialized to offer pharm-a-spheres™ sugar spheres with a tailor-made and reproducible particle size distribution. This is possible by long term experience with the sizing, classification, and particle size analysis of this product.

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PHARM-A-SPHERES ®

ITEM-Nº	MESH ASTM	DIÂMETRO EM µM
08001	170-100	90-150
08013	100-80	150-180
08023	80-70	180-212
08025	80-60	180-250
08033	70-60	212-250
08035	70-50	212-300
08043	60-50	250-300
08050	50-45	300-355
08052	50-40	300-425
08053	60-40	250-425
08062	45-35	355-500
08063	45-40	355-425
08065	50-35	300-500
08073	40-35	425-500
08130	35-30	500-600
08150	35-25	500-710
08230	30-25	600-710
08250	30-20	600-850
08330	25-20	710-850
08350	25-18	710-1,000
08430	20-18	850-1,000
08450	20-16	850-1,180
08530	18-16	1,000-1,180
08630	16-14	1,180-1,400
08643	16-12	1,180-1,700
08653	14-12	1,400-1,700
08663	12-10	1,700-2,000

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PHARM-A-SPHERES ®

TYPES OF PRODUCT	DESCRIPTION	GRADE	FORM	APPLICATIONS	SPECIFICATIONS
Sugar spheres	A versatile excipient for oral pellet medications with modified release kinetics.	The sugar spheres are made from natural and inert ingredients, specifically sucrose and corn starch, in accordance with international pharmacopoeias such as Ph.Eur. and USP/NF.	The sugar spheres are available in two main forms: • **Microspheres:** Ranging from 100 to 500 micrometers. • **Standard spheres:** Ranging from 0.5 to 2 millimeters.	Sugar spheres are widely used as excipients in sustained-release pellet formulations for oral medications. Due to their high sphericity and mechanical stability, they are ideal for coating with active substances and sustained-release additives.	• **Compliance:** The sugar spheres comply with international pharmacopeias (Ph. Eur. and USP/NF) and have an FDA Drug Master File (DMF) available. • **Quality:** Production and testing are conducted by the ISO 9001 quality management system and the IPEC GMP guide. • **Available Sizes:** 106 µm (ASTM mesh 140) 125 µm (ASTM mesh 120) 150 µm (ASTM mesh 100) 180 µm (ASTM mesh 80) 212 µm (ASTM mesh 70) 250 µm (ASTM mesh 60) 300 µm (ASTM mesh 50) 355 µm (ASTM mesh 45) 425 µm (ASTM mesh 40) 500 µm (ASTM mesh 35) 600 µm (ASTM mesh 30) 710 µm (ASTM mesh 25) 850 µm (ASTM mesh 20) 1000 µm (ASTM mesh 18) 1180 µm (ASTM mesh 16) 1400 µm (ASTM mesh 14) 1700 µm (ASTM mesh 12) 2000 µm (ASTM mesh 10) • **Other sizes are available upon request.**

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LACTOSE MEGGLE

The world of lactose is the world of MEGGLE.
We have been providing the pharmaceutical market segment for more than 60 years with a broad-based lactose product portfolio found nowhere else in the industry.
Our product portfolio encompasses a broad array of options with solutions for any requirement. This table outlines the product properties, dosage form applications, re-test and standard package sizes, helping you decide on the perfect solution for your formulation needs – from MEGGLE, of course.

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LACTOSE MEGGLE

TYPES OF LACTOSE	CATEGORY	TABLETING PROCESS	POWDER PREPARATIONS	FLOWABILITY	COMPACTIBILITY	RETEST/ SHELF-LIFE	PACKAGING
GranuLac® 70*	Milled	Wet granulation and Dry granulation	Capsules and Sachets	Sufficient	Satisfactory	36 Months	25 kg paper bag
GranuLac® 80							
GranuLac® 140*			Sphere	Insufficient/not advised	Very good		
GranuLac® 200*|*					Excellent	24 Months	
GranuLac® 230							
SorboLac® 400						36 Months	20 kg paper bag
Tablettose® 70	Agglomerated	Direct compression	Capsules and Sachets	Very good	Good		
Tablettose® 80				Good			25 kg paper bag
Tablettose® 100* **					Very good	24 Months	
FlowLac® 90	Spray-dried			Excellent	Excellent	36 Months	25 kg carton box
FlowLac® 100* **				Very good	Very good	18 Months	25 kg paper bag
DuraLac® H**	Anhydrous	Dry granulation and Direct compression	Capsules, Sachets and Sphere	Satisfactory	Good	36 Months	25 kg carton box
Cellactose® 80	Spray-dried and Co-processed		Capsules and Sachets	Good	Excellent		20 kg paper bag
MicroceLac® 100				Very good		18 Months	
MicroceLac® Plus							
StarLac®					Very good	36 Months	25 kg paper bag
CombiLac®					Excellent	24 Months	20 kg paper bag
RetaLac®	Agglomerated and Co-processed	Direct compression	-	Good	Good		12 kg plastic drum
PrismaLac® 40	Sieved	-	Capsules and Sachets	Good	Insufficient/not advised	36 Months	20 kg paper bag
CapsuLac® 60				Very good			25 kg paper bag
SacheLac® 80							
SpheroLac® 100				Satisfactory	Sufficient		
InhaLac® 70	Sieved		Dry powder inhalation	-	-	24 Months	25 kg carton box
InhaLac® 120							
InhaLac® 160							
InhaLac® 230							
InhaLac® 240							
InhaLac® 251							
InhaLac® 140	Milled						20 kg carton box
InhaLac® 145							
InhaLac® 150							25 kg carton box
InhaLac® 180							25 kg carton box
InhaLac® 300	Fine Milled						20 kg carton box
InhaLac® 400							15 kg carton box
InhaLac® 500						18 Months	6 kg carton box
Lactose LE	Special application	-		-	-	24 Months	20 kg carton box
Compaction Blend M	Special application	Direct compression	-	Excellent	Excellent	36 Months	20 kg paper bag

*Dual production sites in Germany and the US | **US production site | *** Low nitrite lactose grades available

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SILICA

The challenge of Silicas by Evonik is ensure the quality, safety, and efficacy of health care products, in compliance with regulatory standards. Silica solutions improve the performance and stability of health care products. These include high-purity silicas for use as excipients, carriers, and flow aids in pharmaceuticals. Evonik's silica enhance quality, safety, and efficacy of health care products and help to meet regulatory standards. All this results in better patient outcomes.

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SILICA

TYPES	APPLICATIONS	ADVANTAGES
Aerosil® 200 Pharma	Sliders for solid dosage forms and thickeners for oily dosage forms	• Standard glidant solution
Aerosil® 200 VV Pharma		• For mixtures with bigger particles • For mixtures with particles with uneven surfaces • Optimized logistics (storage space) and reduced packaging waste
Aerosil® 300 Pharma		• For mixtures with small particle size • For mechanically more stable tablets
Aerosil® R 972 Pharma	Slider for powder mixtures and suspension stabilizers	• Typically, the most effective flow aid • For influencing disintegration time • For moisture protection"
Aeroperl® 300 Pharma	Adsorbent for liquid pharmaceutical actives and the improvement of drug stability and bioavailability	• High purity precursors, thus extraordinarily low heavy metal content • No organic or biogenic materials used in production • Purely amorphous, inert to most chemicals, and provides improved handling properties • High density, requiring limited storage space • Optimized dust generation on handling
SIPERNAT® 22 S	Anti-Caking, Free-flow and carrier agent	• Improves flow and handling • Provides caking protection • Efficient drying and/or milling processes • Storage and transport stability • Support sustainable food manufacturing • It is safe to use • Are Amourphous material
SIPERNAT® 340		
SIPERNAT® 50 S		
SIPERNAT® 380		
SIPERNAT® 20		
SIPERNAT® 22		
SIPERNAT® 50		
SIPERNAT® 2200		
SIPERNAT® 160 PQ		
SIPERNAT® 180 PQ		

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KRONOS

Titanum Dioxide by KRONOS ® is the world's primary pigment for providing whiteness, brightness, and opacity. KRONOS offers high purity TiO2 pigments that are approved for the coloring of pharmaceuticals.

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KRONOS

TYPES OF PRODUCT	CATEGORY	GRADE	DESCRIPTION	APPLICATIONS	PROPERTIES
Titanium Dioxide	**Kronos® 1171**	Pharmaceutical Grade White Pigment	Purified anatase pigment for decorative cosmetics and pharmaceuticals	• Coloring pharmaceutical products • Decorative cosmetics • Personal care products	• Meets the purity requirements for titanium dioxide E171 in the EU* E171 is authorized for use in cosmetics and pharmaceuticals (food and feed applications are not approved in the European Union and Switzerland). • Meets the purity requirements for color additives according to the FDA in the US* • Is certified according to Food Safety System Certification (FSSC) 22000 (in recent version)"

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JUNGBUNZLAUER

CITROFOL®, triethyl citrate, AI by Jungbunzlauer is a 100% bio-based citrate ester that is manufactured by the esterification of citric acid and ethanol that contributes as plasticizer to the performance of coatings.

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JUNGBUNZLAUER

TYPES OF PRODUCT	CATEGORY	DESCRIPTION	APPLICATIONS	PROPERTIES	SPECIFICATIONS
Triethyl Citrate	**Citrofol® AI**	It is a versatile, 100% bio-based citrate ester derived from citric acid and ethanol. It has various applications across different industries: **Food Industry:** Used as a flavor and flavor carrier and a processing aid for whipping dried egg white products. **Personal Care:** Acts as a solvent, diluent, and fixative in perfumes and fragrances. It is also effective in deodorants by inhibiting the enzymatic breakdown of sweat components. Approved by ECOCERT GREENLIFE and conforms to the COSMOS Standard. **Pharmaceuticals:** As a plasticizer, enhancing the performance of enteric coatings for controlled-release tablets.	• **Food:** Flavours, function Carriers Flavours • **Beverages:** Alcoholic beverages Carbonated soft drinks Sports drinks | Energy drinks Tea | Coffee | RTD • **Healthcare:** Medical devices OTC | Food supplements Pharmaceutical products • **Personal Care** Colour cosmetics Deodorants Fragrances Hair care Skin care • **Cleaners & Detergents** Surface care • **Industrial Applications** Adhesives | Sealants Agrochemicals | Fertilisers Fine chemicals Inks | Paints | Coatings Metal surface treatment Paper Plastics | Polymers • **Feed & Pet Food** Feed Pet Food • **Pharma** Emollient Plasticiser	• Derived from 100 % bio-based raw materials • Clear, practically colorless, oily liquid • High boiling point - low volatility • Excellent compatibility with polar polymers such as acrylics, vinyl resins, ethylene-vinyl acetate, and cellulose derivatives	• It is supplied in intermediate bulk containers (IBCs) with a net weight of 1000 kg, drums with a net weight of 225 kg, and small drums with a net content of 25 kg. Other packaging is possible upon request. • According to the REACH Regulation, it was registered with the European Chemicals Agency (ECHA) in 2013."

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HEALTH INGREDIENTS

Global use of omega-3 fatty acids is growing rapidly due to rising consumer demand for supplements that can support healthy heart, brain, joint and eye function during all stages of life. However, with consumers becoming increasingly wellinformed about their dietary options, traditional omega-3 supplement forms are no longer enough. To maximize brand loyalty, consumer surveys have shown that products must be as efficacious, convenient and comfortable as possible.

BENEFITS OF EPA AND DHA OMEGA-3S:

- Support normal development of the eyes and brain
- Contribute to normal heart function
- Help maintain normal blood triglyceride levels
- Help maintain normal blood pressure
- Contribute to normal brain function and maintenance of normal vision in adults

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HEALTH INGREDIENTS

HEALTH INGREDIENTS	CATEGORY	SUBTYPES	APPLICATIONS	ADVANTAGES
AvailOm®	High concentration Omega-3 Lysine complex powder	AvailOm® 50 High EPA	Dietary supplements for heart health, joint health & inflammation (for healthy aging).	• 50% EPA/DHA concentration in powder – highest in its class • 5 times more bioavailable than standard omega-3 softgels • Directly compressible and easily combined with other ingredients • Unmatched oxidation protection with 4 years of stability
		AvailOm® 50 High DHA	Dietary supplements for infant eye & brain development, eye health & cognition (pregnancy, maternity & healthy aging).	
		AvailOm® 50 High DHA Algae (vegan)		
Amino acids	Amino acids for nutritional applications	Glycine* L-Alanine* L-Asparagine hydrate* L-Aspartic Acid* L-Glutamic Acid * L-Leucine* L-Lysine hydrate* L-Methionine* L-Phenylalanine* L-Proline* L-Serine* L-Threonine* L-Valine*	Our amino acids can be used in parenteral nutrition, medical (enteral) nutrition, infant nutrition, and dietary supplements. They can also be used as excipients, APIs, and building blocks of APIs and advanced intermediates in cell culture and cosmetics.	• Our amino acids are suitable for producing biopharmaceuticals, such as therapeutic proteins or viral vectors. • Can be used as intermediaries and building blocks for APIs. • They can be used as excipients, for example, for shelf life preservation or as a crystallization inhibitor. • Our amino acids are relevant for patients with problems such as malnutrition, food allergies, and gastrointestinal issues; for premature babies or those with lactose intolerance; to support ammonia detoxification, anti-fatigue, or other active lifestyle needs. • Can be used in administering nutrition outside the gastrointestinal tract. • Our amino acids can also help with applications related to anti-aging, skin damage, and hair and nail growth.

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PARENTERAL DRUG DELIVERY SOLUTIONS

Controlled release as well as long-acting medication delivery formulations. Our core products and services leverage nearly 40 years of leadership. Polymeric-based drug products for parenteral extended release; Non-animal derived materials for liposomal-based drug products and Custom polymer synthesis.

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Leading Beyond Chemistry

PARENTERAL DRUG DELIVERY SOLUTIONS

SOLUTION	CATEGORY	GRADE	END GROUP	APPLICATIONS	ADVANTAGES
RESOMER®	Bioresorbable Polymers	50:50 Poly(DL-lactide-co-glycolide) 65:35 Poly(DL-lactide-co-glycolide) 75:25 Poly(DL-lactide-co-glycolide) 85:15 Poly(DL-lactide-co-glycolide)	Ester or Acid	Parenteral extended release	• industry-leading selection of functional excipients for parenteral controlled release • 100% bioabsorbable, completely metabolized by the body, and ideal for terminal sterilization • long stability supported by data and are highly suitable for use with small molecules, peptides, proteins and other substances
LACTEL®	Bioresorbable Polymers	50:50 Poly(DL-lactide-co-glycolide) 65:35 Poly(DL-lactide-co-glycolide) 75:25 Poly(DL-lactide-co-glycolide) Poly(DL-lactide)		Parenteral extended release	• non-solvent purified bioabsorbable polymers • broad catalog of standard polymers available as a cost effective supply due to streamlined manufacturing processes • common application areas for LACTEL® standard polymers include veterinary medicine, where bioresorbable polymers are used in long-acting injectable formulations, and human generic drug formulations, which require price-sensitive planning and quick shipment to support demanding, fast-paced markets
Lipid-based materials and formulation	Custom lipids	NA		Lipid nano particles	• Launch-focused process development for commercial supply • Analytical method development services • Identification and characterization of impurity profiles • Extensive process validation and stability studies • non-GMP samples for compatibility studies • cGMP compliant manufacturing at any scale • Established quality systems • Global regulatory support including DMF preparation and filing
	PhytoChol® Inject			It is a high-purity, vegetal-derived cholesterol designed for nucleic acid therapeutics. It plays a crucial role in lipid nanoparticles that protect mRNA, enhancing drug release, cell membrane penetration, and stabilization. This ultra-low endotoxin cholesterol is suitable for parenteral applications and offers a superior alternative to traditional animal-based cholesterol. It complies with USP-NF, Ph. Eur, and JP standards.	• Non-animal-derived • Secure and stable supply • Large-scale manufacturing • High-purity, consistent quality"
	LIPEX® Flow Thermobarrel Extruder			Industry-leading bench-top extruders for R&D and cGMP manufacturing of liposomal formulations in both academia and industry.	• High throughput • Wide operating range • Fast processing time • Minimizes process risk • 6x increase in Effective Filtration Area • 3x increase in Maximum Allowable Operating Pressure
PhytoSquene®	non-animal-derived squalene	NA		PhytoSquene® is our non-animal-derived squalene that can be used in vaccines and other pharmaceutical applications. In the healthcare industry, squalene is used in parenteral drug delivery as a component in adjuvant systems where it works as an additive that stimulates the body's immune response to the active ingredient in a vaccine.	• Protects life below water: • Preserves biodiversity • Renewable raw materials • Consistent quality: • Consistent quality and high purity • Compliant with Ph. Eur. specifications • Supply security: • Supply chain reliability • Large-scale manufacturing
CDMO Services	NA			Fully integrated solutions provider for advanced drug delivery and can support any stage of the drug development process, from the manufacturing of pharmaceutical excipients to the development of innovative formulations, as well as the production of clinical and commercial drug products.	• More than 25 years' experience developing lipid-based delivery systems • Significant experience formulating nucleic acid-based drugs • Enhancement of solubility and bioavailability of high potency APIs through encapsulation in a lipid carrier • Seamless transition from scale up through clinical manufacturing • Comprehensive analytical services to accompany R&D, toxicology, clinical and commercial manufacturing • LIPEX® extruders ranging from benchtop to commercial production scale to support conventional liposomal formulations

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CELL CULTURE

Our extensive Cell Culture portfolio is designed to cover a spectrum of applications from biopharmaceutical R&D and manufacturing to medicinal applications. The highest purity standards are of course imperative to guarantee reproducibility and meet the strictest regulatory standards. Beyond the fact that we do not use any animal-derived components, our approach to ensuring consistency in terms of quality and reproducible performance builds on a quality system that allows a smooth transfer from R&D to regulated production or clinical applications. Our production network relies on an excellent degree of backward integration to ensure the highest level of quality control and to offer excellent solutions for your biopharma cell culture applications.

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CELL CULTURE

	CATEGORY	SUBTYPES	APPLICATIONS	ADVANTAGES
cQrex®	Cell culture ingredients and services for research, manufacturing and clinical applications	cQrex® AQ (L-Alanyl-L-glutamine)	Recommended for mammalian cell lines or primary cells. Not recommended for cell lines using a glutamine-dependent selection system	• Stabilized form of L-glutamine • Prevents the breakdown of glutamine that would release ammonia into the medium • Cultures supplemented with cQrex® AQ tend to have higher cell densities when compared to cultures using free glutamine or other glutamine peptides"
		cQrex® GQ (Glycyl-L-glutamine hydrate)	Recommended for mammalian cell lines or primary cells. It is not recommended for cell lines using a glutamine-dependent selection system.	• Stabilized form of L-glutamine • Prevents the breakdown of glutamine that would release ammonia into the medium • Compared to cQrex® AQ or other forms of alanine-based stabilized glutamine, cultures supplemented with cQrex® GQ tend to lower cell densities at identical or high titer levels. • Cultures supplemented with peptides generally have lower lactate and ammonia levels compared to cultures using free glutamine"
		cQrex® GY (Glycyl-L-tyrosine dihydrate)	Useful for all cell lines, including those with a glutamine-dependent selection system.	• Highly soluble and bioavailable form of L-tyrosine; Ideal for use in pH-neutral feed media; • Eliminates the risks associated with using a separate high-pH feed medium for tyrosine dissolution; • It may be necessary to reduce the concentration of free glycine in the feeding medium to compensate for the glycine added through the peptide; • Helps you get the best performance."
		cQrex® AY (L-Alanyl-L-tyrosine dihydrate)	Useful for all cell lines, including those with a glutamine-dependent selection system.	• Highly soluble and bioavailable form of L-tyrosine; Ideally used as part of a pH-neutral feed medium; • Eliminates the risks associated with using a separate high-pH feed medium for tyrosine dissolution; • For best performance, reducing the concentration of free L-alanine in the medium may be considered."
		cQrex® AC (N,N'-di-L-Alanyl-L-cystine)	Useful for all cell lines, including those with a glutamine-dependent selection system.	• Highly soluble and bioavailable form of L-cystine; Prevents oxidation of free L-cysteine into L-cystine; • Can be used to increase the concentration of L-cysteine/L-cystine in basal media or to prepare highly concentrated, pH-neutral foods; • When added to the basal medium, it can prevent precipitation caused by feeding too much L-cysteine and/or L-cystine."
		cQrex® KC (N,N'-di-L-Lysyl-L-cystine dihydrochloride)	Useful for all cell lines, including those with a glutamine-dependent selection system.	
		cQrex® AKG (a-ketoglutaric acid)	Useful for all cell lines, including insect cells.	• cQrex® AKG is a metabolite derived from L-glutamine; • It is part of the TCA cycle; • Acts as an eliminator against reactive oxidative species; • Protects the cell and the product from oxidative stress; • May lead to higher titter and promoted cell growth; • For insect cells, it can increase the yield of baculovirus by 6 to 7 times."
PhytoChol®	Plant-derived cholesterol for cell culture	PhytoChol® BioPharma	It enhances cell culture by adding cholesterol, which is vital in cell culture media. This addition can significantly improve outcomes, especially in media without fetal bovine serum (FBS) and natural lipids, boosting cell growth, protein production, virus production, and virus infectivity. It is suitable for various cell lines, including NS0 for protein production, insect cell lines, and packaging cell lines for virus production. Evonik offers application and formulation guidelines to ensure a high-quality, consistent product.	• Non-animal-derived • Secure and stable supply • Large-scale manufacturing • High-purity, consistent quality"
Amino acids	Amino acids	"Amino Acids	L-Aspartic acid *	Glycine*
		"Amino Acids Salts & Derivatives	L-Lysine Acetate*	L-Lysine HCl*
		"Others	DL amino acids*	Amino acid esters & amides*
Carbohydrates	Carbohydrates	D-Galactose	Specialty carbohydrates for optimized energy supply and protein glycosylation	Cell energy needs are partially covered by carbohydrates • More balanced primary metabolism when replacing D-glucose by carbohydrates with slower uptake rates • Limited formation of toxic by-product (lactate) results in higher cell culture performance Carbohydrates are building blocks for protein glycosylation • Modulate glycosylation profile of mAbs and recombinant proteins by supplementing selected carbohydrates • Biosimilar development: Match cQAs2 of originator Plant derived, Highly pure and Consistent quality Supplementation of D-Galactose in CHO cells leads to more complex N-linked glycans (increase of galactosylation and sialylation) without impacting the cell culture performance
		D-Mannose		

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MEDICAL DEVICE

Standard, custom and specialized polymers for the production of bioresorbable implants, medical devices and tissue engineering solutions, besides a superior and highly tunable materials for long lasting dermal filler applications accomplished by outstanding skin care. A global market leader with a diversified customer base; breadth of technical knowledge and industry expertise; support from feasibility through to commercial scale-up and application technology labs in the U.S., EU and Asia.

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MEDICAL DEVICE

MEDICAL DEVICE SOLUTIONS	CATEGORY	APPLICATIONS	SUBTYPES	ADVANTAGES
RESOMER®	Bioresorbable polymers	Standard, custom and specialized polymers for the production of bioresorbable implants, medical devices and tissue engineering solutions	Poly (caprolactone) Poly (D,L- lactide) Poly (dioxanone) Poly (glycolide) Poly (glycolide-co-lactide) Poly (glycolide-co-e-caprolactone) Poly (glycolide-co-trimethylene carbonate) Poly (L-lactide) Poly (L-lactide-co-glycolide) Poly (L-lactide-co-D,L-lactide) Poly (L-lactide-co-e-caprolactone) Poly (L-lactide-co-trimethylene carbonate) Composites PLA-PEG copolymers Select Filaments PrintPowder Powder	• The safety and biocompatibility you need • The performance and supply security you demand.
VECOLLAN®	Recombinant collagen	Fermentation-based, animal-origin free collagen for medical, pharmaceutical, cell culture, and tissue engineering markets	NA	• Non-animal derived • Optimal safety with no risk of pathogenic transmission • Triple-helix structure and highly soluble • High purity process for batch-to-batch reproducibility • Easily processible into several shapes
Biosynthetic cellulose	Biosynthetic Cellulose	Natural, fermentation-based renewable biopolymer of highly pure cellulose well-suited for medical and pharmaceutical applications		• Nature-identical material • Fiber structure comparable to collagen • Flexible material with high tensile strength • Well-suited carrier for cells, drugs, dyes and more • Long-term biostability, non-biodegradable • Permeable to gases and liquids • Cell attachment adjustable by modification • Sterilizable • Can be cultured to grow into the final application form (e.g., membrane, net, fiber, cartilage-like)
Endexo® surface modification technologies	Enhanced medical device biocompatibility and performance	Proprietary surface modification technology to improve medical device safety and functionality		• A highly versatile proprietary platform • Permanent surface modification • Compatible with a range of base polymers • Proven performance over a decade of commercial use in medical device applications • Proven functionality, safety and biocompatibility • Reduce thrombus accumulation • Reduce bacterial adhesion and biofilm formation • Lower coefficient of friction

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MEDICAL DEVICE APPLIED TO THE ADVANCED AESTHETIC DERMATOLOGY

MEDICAL DEVICE SOLUTIONS	CATEGORY	APPLICATIONS	SUBTYPES	ADVANTAGES
RESOMER® POWDER	Bioresorbable Polymers	Dermal filler and collagen biostimulator	• Poly (caprolactone) • Poly (L-lactide) • Select	• Highly versatile PCL and PLA polymers for long lasting dermal filler applications • Powdered forms available for easy to use non solvent processing • Non-irritant and highly biocompatible • Semipermanent with adjustable long-term effect up to 2 years • Considered as biostimulator (induces collagen synthesis) • Highly compatible with bio-actives and anaesthetics • More than 30 years of efficacy, safety, supply security • Proprietary Powder Technology enables customization of particle size to individual needs for easy-to-use solvent-free processing without additional lyophilization, joined development activities ongoing • Tunable particle size distribution (median size > 25 µm)
VECOLLAN®	Recombinant collagen	Dermo filler and collagen biostimulator	NA	• Recombinant vegan collagen with excellent tolerability and high quality • Highly adjustable platform technology with improved performance over animal derived or human collagen • Reproducible high quality created by a fermentation based highly pure process • Enables simplified and straightforward regulatory approval • Highly sustainable with a fully secured global supply chain • Highly tuneable for customizable degradation profiles: several technologies available for long lasting dermal filler applications • Triple helix combined with high solubility for superior customization • Superior handling and application procedure due to adaptable viscosity
Biosynthetic cellulose	Biosynthetic cellulose	Facial mask, eye pad and lip pad		• Natural vegan highly pure biopolymer with homogeneous network structure and high fluid absorption characteristics • Soothes skin irritation and supports regeneration of skin • Perfect regeneration for tensions, redness and itching • Skin calming and immediate gentle cooling • Purely natural without additives or preservatives • High water content > 95% for permanent and constant water supply and cooling after dermatological treatments (> 4 hours) • Self adhere, available in various forms • Side-effect free aftercare, no known allergenic reactions • easy and painless to remove • Already used by doctors and clinics all over the world

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ELEMENTIS

Antacid compounds play a crucial role in the pharmaceutical industry as they are designed to alleviate symptoms associated with excess stomach acid, such as heartburn and indigestion. Formulated into various pharmaceutical products, including tablets, liquids, and chewable formulations, antacids continue to be a cornerstone in the treatment of acid-related gastrointestinal issues, providing effective relief to millions of individuals worldwide.

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ELEMENTIS

TYPES OF PRODUCT	DESCRIPTION	GRADE	FORM	APPLICATIONS	SPECIFICATIONS
Sucralfate	Sucralfate, an aluminium salt of sucrose octasulfate (SOS), helps treat gastric issues by enhancing the protective mechanisms of the stomach and duodenal mucous membranes. It neutralizes acid, forms a protective layer over eroded areas, protects lesions, and adsorbs pepsin and bile acids, inhibiting peptic activity.	S 215	Powder	• **Sucralfate S 215:** powder is suitable for use in tablet formulations.	• **Type:** S 215 Assay Al: 15.5 - 18.5 [%] for all types Assay SOS: 30.0 - 38.0 [%] for all types • **Density (tapped):** S 215: 0.55 - 0.75 [g/ml] S 225: 0.30 - 0.48 [g/ml] S 235: 0.60 - 0.80 [g/ml] • **d_{50}:** S 215: 30 - 70 [µm] S 225: 3 - 5 [µm] S 235: 90 - 130 [µm] • **Pharmacopoeia:** USP, PhEur for all types
		S612	Suspension	• **Sucralfate S612** are suspensions with an active content of 30% and temporary preservation with p- and m-ester. S612 is ideal for liquid antacid formulations, while S625 is a very fine suspension with a low particle size.	• **Type:** S612 • **Assay:** S601: > 4.8 [%] S611: 4.7 - 6.0 [%] S625: 4.7 - 6.0 [%] • **Assay SOS:** S601: > 8.6 [%] S611: 8.3 - 13.4 [%] S625: 9.1 - 12.3 [%] • **Particle size:** S601: d_{50}: 5 - 10 µm S611: d_{50}: 5 - 10 µm S625: d_{50}: 3 - 5 µm, min 85% < 10 µm • **Pharmacopoeia:**USP for S611 and S625"
Magnesium Hydroxide	Magnesium hydroxide is a widely used antacid, second only to aluminum hydroxide. It is found in both suspension and powder forms, often combined with aluminum hydroxide. This combination is recommended because magnesium hydroxide alone can cause high stomach pH levels, leading to increased acid production. Additionally, combining it with aluminum hydroxide helps counteract its laxative effect, thanks to aluminum hydroxide's mild constipating properties.	GILUMAG® D211A	Powder	• **Magnesium hydroxide powders:** are used in the production of tablets, granules, and powder mixtures, often in combination with ALUGEL® A 211 or ALUGEL® A 215. They differ concerning particle size and bulk density	• **Type:** D211A • **$Mg(OH)_2$ Assay:** 95.0 – 100.5 % for all types • **Density (tapped):** D 211: 0.40 – 0.60 g/ml D 212: 0.60 – 0.80 g/ml D 214: 1.01 – 1.25 g/ml • **d_{90}:** D 211: 6 – 10 µm D 212: 10 – 25 µm D 214: 20 – 45 µm • **Pharmacopoeia:** USP, PhEur for all types"
Aluminium Hydroxide	Aluminium hydroxide, or aluminium hydroxycarbonate, is a widely used antacid in both suspension and powder forms. It can be used alone or with magnesium hydroxide. Its extensive use in antacids is due to its excellent pharmacological properties, proven over many years. Aluminium hydroxide gel effectively neutralizes and buffers gastric hydrochloric acid without known harmful side effects. Various grades with different properties are available.	ALUGEL® A 211	Powder	• **ALUGEL® A 211** is the most widely used active for tablet, granulate, or powder manufacture. Its high reaction capacity with hydrochloric acid ensures rapid onset and prolonged action in the stomach. The typical morphology of this spray-dried gel.	• **Assay:** Al(OH)3 = min. 76,5% Al2O3 = 47,0 - 60,0% • **Density (tapped):**0,28 - 0,38 g/ml • **d_{50}:** 10 - 20 µm • **Pharmacopoeia:** USP, Ph.Eur., BP
	Wet gels are primarily used in liquid antacid preparations due to their easy administration, pleasant taste, high active content, and rapid onset of action compared to tablets. They are also conveniently packaged, such as in dosed sachets. ALUGEL® suspensions come in various solid contents and rheological properties, allowing customers to select the most suitable grade for their needs.	ALUGEL®A 651	Wet Gel	• **ALUGEL® A 651** is a highly concentrated gel with an Al(OH)3 content of 19,1 – 20,6%. It has a limited flow capability, but after dilution to approx. 15,3 % Al(OH)3, ALUGEL® A 651 becomes a free-flowing suspension with minimum sedimentation characteristics and a rapid reaction rate with hydrochloric acid.	• **Type:** LV HV • **Assay:** Al(OH)3 = 19,1 - 20,6% Al2O3 =19,1 - 20,6% • **Viscosity (Brookfield):** min. 6000 mPa s (LV 3/12) min. 150 mPa s (LV 2/12) at 6,1% Al(OH) • **Pharmacopoeia:** USP.

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