

Biocatalysts

ENZYMES

KITS

IMMOBILIZED
ENZYMES

ENZYME
CARRIERS

 **TREM**

Biocatalysts



Strem Chemicals has been providing fine chemicals for research and commercial production for over fifty years. As part of our biocatalyst product line, we currently offer enzymes, including immobilized enzymes, enzyme carriers and a selection of biocatalyst kits for screening of various processes. We continue to expand the scope of this category in order to better serve the biocatalyst and enzyme development fields.

At Strem, we also offer a wide variety of ligands, nanomaterials and CVD/ALD precursors. Most of our products are of high purity, typically at 99%, while some are as high as 99.9999% metals purity. We continually seek to provide new technologies from around the globe and add to our product line. We have licensing agreements with industry and academia, which allow easier access to these patent-protected products for our customers. We look forward to continued growth in order to best serve our customers' needs with the quality and service they can trust from Strem.

As part of our ongoing commitment to quality, we have achieved ISO 9001 certification for the Quality Management System (QMS) at our corporate headquarters in Newburyport, Massachusetts.

In addition, custom synthesis services are provided on a contract basis. For pharmaceutical applications, manufacturing is conducted under current Good Manufacturing Practices (cGMP) in FDA inspected kilo-lab suites. Complete documentation is available, including validation and stability studies. Active Drug Master Files (DMF's) are maintained in North America and Europe.

Our other booklets, which focus on applications and product classes, are available in print per request and also on our website. Below is a list of current booklet titles that are available. Please also check our Product Resources section online to find additional literature offerings, such as the Strem Chemiker, our technical publication, and product literature sheets.

- Biocatalysts
- Buchwald Ligands and Precatalysts
- Carbon-Base Nanomaterials & Elemental Forms
- Catalysts & Ligands
Sold in Collaboration with Takasago
- Chiral Phosphoric Acids
- Gold Elements & Compounds
- Heterogeneous Catalysts
- High Purity Chiral Reagents
- Kits
- Materials for Energy Applications
- Metal Catalysts for Organic Synthesis
- Metathesis Catalysts
- MOCVD, CVD & ALD Precursors
- MOFs and Ligands for MOF Synthesis
- Nanomaterials
- New Products
- Other Ligands
- Phosphorous Ligands and Compounds
- Photocatalysts
- PURATREM: High Purity Inorganics

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Chief Executive Officer



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Glossary of Terms

[α]_D	Specific rotation
AAS	Atomic Absorption Standard
ACS	Conforms to American Chemical Society specifications
air sensitive	.....	Product may chemically react with atmospheric oxygen or carbon dioxide at ambient conditions. Handle and store under an inert atmosphere of nitrogen or argon.
amp	.....	Ampouled
b.p.	.....	Boiling point in °C at 760mm, unless otherwise noted
d.	.....	Density
dec.	.....	Decomposes
elec. gr.	.....	Electronic Grade, suitable for electronic applications
f.p.	.....	Flash point in °F
gran.	.....	Granular
heat sensitive	.....	Product may chemically degrade if stored for prolonged periods of time at ambient temperatures or higher. Store at 5°C or lower.
hydrate	.....	Unspecified water content which may vary slightly from lot to lot
hygroscopic	.....	Product may absorb water if exposed to the atmosphere for prolonged periods of time (dependent on humidity and temperature). Handle and store under an inert atmosphere of nitrogen or argon.
light sensitive	.....	Product may chemically degrade if exposed to light
liq.	.....	Liquid
m.p.	.....	Melting point in °C
moisture sensitive	.....	Product may chemically react with water. Handle and store under an inert atmosphere of nitrogen or argon.
NMR grade	.....	Suitable as a Nuclear Magnetic Resonance reference standard
optical grade	.....	For optical applications
pwdr.	.....	Powder
primary standard	.....	Used to prepare reference standards and standardize volumetric solutions
PURATREM	.....	Product has a minimum purity of 99.99% (metals basis)
purified	.....	A grade higher than technical, often used where there are no official standards
P. Vol.	.....	Pore volume
pyrophoric reagent	.....	Product may spontaneously ignite if exposed to air at ambient conditions
	.....	High purity material, generally used in the laboratory for detecting, measuring, examining or analyzing other substances
REO	.....	Rare Earth Oxides. Purity of a specific rare-earth metal expressed as a percentage of total rare-earths oxides.
SA	.....	Surface area
store cold	.....	Product should be stored at -18°C or 4°C, unless otherwise noted (see product details)
subl.	.....	Sublimes
superconductor grade	.....	A high purity, analyzed grade, suitable for preparing superconductors
tech. gr.	.....	Technical grade for general industrial use
TLC	.....	Suitable for Thin Layer Chromatography
v.p.	.....	Vapor pressure mm of Hg
xtl.	.....	Crystalline

About Purity

Chemical purity	.....	is reported after the chemical name, e.g. Ruthenium carbonyl, 99%
Metals purity	is reported in parentheses with the respective element, e.g. Gallium (III) bromide, anhydrous, granular (99.999%-Ga) PURATREM where 100% minus the metal purity is equal to the maximum allowable percentage of trace metal impurity

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06-3110	Alcalase® 2.4 L FG (9014-01-1) brown liq.; d. 1.17 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 2.4 AU-A/g. Serine endoprotease that hydrolyzes internal peptide bonds. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes	10g 50g 250g
06-3112	Alcalase® 2.5 L (9014-01-1) amber liq. (semitransparent); d. 1.08 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 2.5 AU-A/g. Serine endoprotease that hydrolyzes internal peptide bonds. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes	10g 50g 250g
07-3155	CalB immo 1090™ - Immobilized enzyme white to slightly yellow spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 300-710 micron; CalB immo 1090 is an adsorbed preparation and is suitable for applications in solvent-free systems like oils, as well as organic solvents and it can be used for (regio- and stereoselective) esterifications and transesterifications. CalB Immo 1090 has many advantages including high activity and the possibility to use in oils, organic solvent and bi-phasic systems. Sold in collaboration with Purolite for research purposes only.	10g 50g 250g
07-3152	CalB immo 5587™ - Immobilized enzyme white to slightly yellow spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 300-710 micron; CalB immo 5587 is an adsorbed preparation and is particularly suitable for applications where cost is an essential parameter, like biodiesel or industrial oil manufacture. CalB Immo 5587 has many advantages including cost-effectiveness in processes like biodiesel manufacture. It is also a highly robust carrier, particularly suitable for column configurations. Sold in collaboration with Purolite for research purposes only.	10g 50g 250g
07-3159	CalB immo 5872™ - Immobilized enzyme white to slightly yellow spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 300-1500 micron; CalB immo 5872 is an adsorbed preparation and is suitable for applications in solvent-free systems like oils, as well as organic solvents and it can be used for (regio- and stereoselective) esterifications and transesterifications. CalB Immo 5872 has many advantages including cost-effectiveness and the possibility to use in oils, organic solvent and bi-phasic systems. Sold in collaboration with Purolite for research purposes only.	10g 50g 250g
07-3142	CalB immo 8285™ - Immobilized enzyme white to slightly yellow spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 100-710 micron; CalB immo 8285 is covalently immobilized and is suitable for applications in water, organic solvents as well as solvent-free systems and can be used for (regio- and stereoselective) hydrolysis, esterifications and transesterifications. The lipase is immobilized by covalent immobilization onto Purolites highly hydrophobic carrier Purolite ECR8285 (an epoxy/butyl methacrylate co-polymer). Sold in collaboration with Purolite for research purposes only.	10g 50g 250g

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07-3148	CalB immo 8806™ - Immobilized enzyme white to slightly yellow spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 300-710 micron; CalB immo 8806 is an adsorbed preparation and is suitable for applications in solvent-free systems like oils, as well as organic solvents and it can be used for (regio- and stereoselective) esterifications and transesterifications. CalB Immo 8806 has many advantages including high activity and the possibility to use in oils, organic solvent and bi-phasic systems. Sold in collaboration with Puro-lite for research purposes only.	10g 50g 250g
07-3130	CalB immo Plus™ - Immobilized enzyme white to off white spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 300-710 micron; CalB immo Plus is suitable for applications in organic solvents as well as solvent-free systems and can be used for (regio- and stereoselective) esterifications and transesterifications. CalB Immo Plus has many advantages including high activity and high mechanical stability. Sold in collaboration with Puro-lite for research purposes only.	10g 50g 250g
07-3133	CalB immo Plus Food Grade™ - Immobilized enzyme white to slightly yellow spherical beads, dry (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year; Particle Size: 300-710 micron; CalB immo Plus Food Grade is supplied in food-grade quality and conforms to the General Specifications and Considerations for Enzyme Preparations Used in Food Processing of the Joint FAO/WHO Expert Committee on Food Additives (JECFA). CalB immo Plus is suitable for applications in organic solvents as well as a solvent-free systems and can be used for (regio- and stereoselective) esterifications and transesterifications. CalB Immo Plus has many advantages including high activity and high mechanical stability. Sold in collaboration with Puro-lite for research purposes only.	10g 50g 250g
06-0925	Enzyme carrier Lifetech™ ECR1030M white to off white spherical beads (wet); SA: 80 - 120 m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 220-340; Lifetech ECR1030M is a copolymer of divinylbenzene (DVB) and methacrylate with no functional groups. It is used for enzyme immobilization by adsorption (hydrophobic interaction) and it is particularly suitable for lipase immobilization such as CALB. Lifetech ECR1030M main features are high mechanical stability compared to other existing resins, low surface area that grants high enzyme activity at low protein loading. Sold in collaboration with Puro-lite for research purposes only.	50g 5x50g
07-2215	Enzyme carrier Lifetech™ ECR1504 white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-1200 micron; Lifetech ECR1504 is a copolymer of divinylbenzene (DVB) and styrene functionalised with tertiary amines. It is used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the tertiary amines on the polymer. It is particularly suitable for immobilization of enzymes with iP in the range 3 - 5 like many glycosidases. Lifetech ECR1504 main features are possibility to regenerate the resin, pH adjustment before immobilization and large particle size for column applications. Sold in collaboration with Puro-lite for research purposes only.	50g 5x50g

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07-2220	Enzyme carrier Lifetech™ ECR1508 white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-1200 micron; Lifetech ECR1508 is copolymer of divinylbenzene (DVB) and styrene functionalised with tertiary amines. It is used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the tertiary amines on the polymer. It is particularly suitable for immobilization of enzymes with iP in the range 3 - 5 like many glycosidases. Lifetech ECR1508 main features are possibility to regenerate the resin, pH adjustment before immobilization and large particle size for column applications. Sold in collaboration with Purolite for research purposes only.	50g 5x50g
07-2224	Enzyme carrier Lifetech™ ECR1604 white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-1200 micron; Lifetech ECR1604 is a copolymer of divinylbenzene (DVB) and styrene functionalised with quaternary amines. It is used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the tertiary amines on the polymer. It is particularly suitable for immobilization of enzymes with iP in the range 3 - 5 like many glycosidases. Lifetech ECR1604 main features are possibility to regenerate the resin, pH adjustment before immobilization and large particle size for column applications. Sold in collaboration with Purolite for research purposes only.	50g 5x50g
07-2230	Enzyme carrier Lifetech™ ECR1640 white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-1200 micron; Lifetech ECR1640 is a copolymer of divinylbenzene (DVB) and styrene functionalized with quaternary amines. It is used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the tertiary amines on the polymer. It is particularly suitable for immobilization of enzymes with iP in the range 3 - 5 like many glycosidases. Lifetech ECR1640 main features are possibility to regenerate the resin, pH adjustment before immobilization and large particle size for column applications. Sold in collaboration with Purolite for research purposes only.	50g 5x50g
06-0905	Enzyme carrier Lifetech™ ECR1090F white to off white spherical beads (wet); SA: 750 - 850 m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 150-300 micron; Pore Diameter: 900-1100 Å; Lifetech ECR1090F is a copolymer of divinylbenzene (DVB) and styrene with high porosity and no functional groups. It is used for enzyme immobilization by adsorption (hydrophobic interaction) and it is particularly suitable for lipase immobilization. Lifetech ECR1090F main features are high porosity, high mechanical stability and high surface area. Sold in collaboration with Purolite for research purposes only	50g 5x50g
06-0913	Enzyme carrier Lifetech™ ECR1090M white to off white spherical beads (wet); SA: 750 - 850 m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 900-1100 Å; Lifetech ECR1090M is a copolymer of divinylbenzene (DVB) and styrene with high porosity and no functional groups. It is used for enzyme immobilization by adsorption (hydrophobic interaction) and it is particularly suitable for lipase immobilization. Lifetech ECR1090M main features are high porosity, high mechanical stability and high surface area. Sold in collaboration with Purolite for research purposes only	50g 5x50g

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06-0810	Enzyme carrier Lifetech™ ECR8204F white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf life: 6 months; Particle Size: 150-300 micron; Pore Diameter: 300-600 Å; Lifetech ECR8204F is a methacrylate polymer functionalised with epoxy groups, used for covalent enzyme immobilization. Epoxides form very stable covalent linkages with different protein surface groups as ε-NH ₂ in Lys or nucleophiles (amino, thiol, phenolic). Immobilization is performed under very mild experimental conditions of pH and temperature, at high ionic buffer strength. Lifetech ECR8204F main features are the low porosity, the hydrophilicity, high mechanical strength and it is optimal for use in batch reactors. Sold in collaboration with Puro-lite for research purposes only	50g 5x50g
06-0813	Enzyme carrier Lifetech™ ECR8204M white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 6 months; Particle size: 300-710 micron; Pore Diameter: 300-600 Å; Lifetech ECR8204M is a methacrylate polymer functionalized with epoxy groups, used for covalent enzyme immobilization. Epoxides form very stable covalent linkages with different protein surface groups as ε-NH ₂ in Lys or nucleophiles (amino, thiol, phenolic). Immobilization is performed under very mild experimental conditions of pH and temperature, at high ionic buffer strength. Lifetech ECR8204M main features are the low porosity, the hydrophilicity, high mechanical strength and it is optimal for use in batch reactors and columns	50g 5x50g
06-0817	Enzyme carrier Lifetech™ ECR8209F white to off white spherical beads (wet) (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 6 months; Particle Size: 150-300 micron; Pore Diameter: 300-600 Å; Lifetech ECR8209F is a methacrylate polymer functionalized with epoxy groups, used for covalent enzyme immobilization. Epoxy groups form very stable covalent linkages with different protein surface groups as ε-NH ₂ in Lys or nucleophiles (amino, thiol, phenolic). Immobilization is performed under very mild experimental conditions of pH and temperature, at high ionic buffer strength. Lifetech ECR8209F main features are the high porosity, the hydrophilicity and it is optimal for use in batch reactors	50g 5x50g
07-1512	Enzyme carrier Lifetech™ ECR8309F white to off white spherical beads (wet); SA: 70 min. m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 150-300 micron; Pore Diameter: 600-1200 Å; Lifetech ECR8309F is a methacrylate polymer functionalized with amino groups on a short spacer (C2). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8309F main features are the medium porosity, the hydrophilicity and its optimal use in batch reactors. Sold in collaboration with Puro-lite for research purposes only	50g 5x50g
07-1515	Enzyme carrier Lifetech™ ECR8309M white to off white spherical beads (wet); SA: 70 min. m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 600-1200 Å; Lifetech ECR8309M is a methacrylate polymer functionalized with amino groups on a short spacer (C2). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8309M main features are the medium porosity, the hydrophilicity and its optimal use in batch reactors and columns. Sold in collaboration with Puro-lite for research purposes only	50g 5x50g

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07-1518	Enzyme carrier Lifetech™ ECR8315F white to off white spherical beads (wet); SA: 60 min. m ² /g <i>(store cold)</i> Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 150-300 micron; Pore Diameter: 1200-1800 Å; Lifetech ECR8315F is a methacrylate polymer functionalized with amino groups on a short spacer (C2). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. Lifetech ECR8315F main features are the high porosity, the hydrophilicity and its optimal use in batch reactors. Sold in collaboration with Purolite for research purposes only	50g 250g
07-1520	Enzyme carrier Lifetech™ ECR8315M white to off white spherical beads (wet); SA: 60 min. m ² /g <i>(store cold)</i> Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 1200-1800 Å; Lifetech ECR8315M is a methacrylate polymer functionalized with amino groups on a short spacer (C2). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8315M main features are the medium porosity, the hydrophilicity and its optimal use in batch reactors and columns. Sold in collaboration with Purolite for research purposes only.	50g 250g
07-1523	Enzyme carrier Lifetech™ ECR8409F white to off white spherical beads (wet); SA: 70 min. m ² /g <i>(store cold)</i> Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 150-300 micron; Pore Diameter: 600-1200 Å; Lifetech ECR8409F is a methacrylate polymer functionalized with amino groups on a long spacer (C6). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8409F main features are the medium porosity, the hydrophilicity and its optimal use in batch reactors. Sold in collaboration with Purolite for research purposes only.	50g 250g
07-1525	Enzyme carrier Lifetech™ ECR8409M white to off white spherical beads (wet); SA: 70 min. m ² /g <i>(store cold)</i> Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 600-1200 Å; Lifetech ECR8409M is a methacrylate polymer functionalized with amino groups on a long spacer (C6). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8409M main features are the medium porosity, the hydrophilicity and its optimal use in batch reactors and columns. Sold in collaboration with Purolite for research purposes only.	50g 250g

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07-1528	Enzyme carrier Lifetech™ ECR8415F white to off white spherical beads (wet); SA: 60 min. m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 150-300 micron; Pore Diameter: 1200-1800 Å; Lifetech ECR8415F is a methacrylate polymer functionalized with amino groups on a long spacer (C6). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8415F main features are the high porosity, the hydrophilicity and its optimal use in batch reactors. Sold in collaboration with Puroilite for research purposes only.	50g 250g
07-1530	Enzyme carrier Lifetech™ ECR8415M white to off white spherical beads (wet); SA: 60 min. m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 1200-1800 Å; Lifetech ECR8415M is a methacrylate polymer functionalized with amino groups on a long spacer (C6). It is used for covalent enzyme immobilization by pre-activation of the resin with glutaraldehyde and to subsequently form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature, at low ionic buffer strength. It can also be used for enzyme immobilization by ionic interaction of the ionizable surface aminoacids (Lys, Arg, His, Asp, Glu) with the charged amines on the polymer. Lifetech ECR8415M main features are the high porosity, the hydrophilicity and its optimal use in batch reactors. Sold in collaboration with Puroilite for research purposes only.	50g 5x50g
07-1532	Enzyme carrier Lifetech™ ECR8806F white to off white spherical beads (wet); SA: 70 min. m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 150-300 micron; Pore Diameter: 350-600 Å; Lifetech ECR8806F is a methacrylic polymer functionalized with octadecyl groups. It is used for enzyme immobilization by adsorption (hydrophobic interaction) and it is particularly suitable for lipase and transaminases immobilization. Lifetech ECR8806F main features are very enzyme activity achieved upon immobilization compared to other existing resins. Sold in collaboration with Puroilite for research purposes only.	50g 5x50g
07-1535	Enzyme carrier Lifetech™ ECR8806M White to off white spherical beads (wet); SA: 70 min. m ² /g (store cold) Note: Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; Particle Size: 300-710 micron; Pore Diameter: 350-600 Å; Lifetech ECR8806M is a methacrylic polymer functionalized with octadecyl groups. It is used for enzyme immobilization by adsorption (hydrophobic interaction) and it is particularly suitable for lipase and transaminases immobilization. Lifetech ECR8806M main features are very high enzyme activity achieved upon immobilization compared to other existing resins. Optimal for column packed reactors. Sold in collaboration with Puroilite for research purposes only.	50g 5x50g
06-0820	Enzyme carrier Lifetech™ ECR8209M white to off white spherical beads (wet); SA: 70 min. m ² /g (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 6 months; Particle Size: 300-710 micron; Pore Diameter: 600-1200 Å; Lifetech ECR8209M is a methacrylate polymer functionalized with epoxy groups, used for covalent enzyme immobilization. Epoxy groups form very stable covalent linkages with different protein surface groups as ε-NH ₂ in Lys or nucleophiles (amino, thiol, phenolic). Immobilization is performed under very mild experimental conditions of pH and temperature, at high ionic buffer strength. Lifetech ECR8209M main features are the high porosity, the hydrophilicity and it is optimal use in batch reactors and columns.	50g 5x50g

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06-0823	<p>Enzyme carrier Lifetech™ ECR8215F white to off white spherical beads (wet); SA: 60 min. m²/g (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 6 months; Particle Size: 150-300 micron; Pore Diameter: 1200-1800 Å; Lifetech ECR8215F is a methacrylate polymer functionalized with epoxy groups, used for covalent enzyme immobilization. Epoxy groups form very stable covalent linkages with different protein surface groups as ε-NH₂ in Lys or nucleophiles (amino, thiol, phenolic). Immobilization is performed under very mild experimental conditions of pH and temperature, at high ionic buffer strength. Lifetech ECR8215F main features are the very high porosity, the hydrophilicity and it is optimal for use in batch reactors.</p>	50g 5x50g
06-0826	<p>Enzyme carrier Lifetech™ ECR8215M white to off white spherical beads (wet); SA: 60 min. m²/g (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 6 months; Particle Size: 300-710 micron; Pore Diameter: 1200-1800 Å; Lifetech ECR8215M is a methacrylate polymer functionalized with epoxy groups, used for covalent enzyme immobilization. Epoxy groups form very stable covalent linkages with different protein surface groups as ε-NH₂ in Lys or nucleophiles (amino, thiol, phenolic). Immobilization is performed under very mild experimental conditions of pH and temperature, at high ionic buffer strength. Lifetech ECR8215M main features are the very high porosity, the hydrophilicity and its optimal use in batch reactors and columns.</p>	50g 5x50g
06-0828	<p>Enzyme carrier Lifetech™ ECR8285 white to off white spherical beads (wet); SA: 100-200 m²/g (store cold) Note: Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 6 months; Particle Size: 250-1000 micron; Pore Diameter: 400-600 Å; Lifetech ECR8285 is a methacrylate polymer functionalized with both butyl and epoxy groups. This combination creates a good balance of hydrophobicity that makes the polymer optimal for immobilization of hydrophobic enzymes like lipases and transaminases. Epoxides form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature. Lifetech ECR8285 main features are the process advantages deriving from hydrophobic property combined with epoxy groups allowing the use in bi-phasic systems. Sold in collaboration with PuroLite for research purposes only.</p>	50g 5x50g
06-3115	<p>Esperase® 8.0 L (9014-01-1) amber liq. (semitransparent); d. 1.07 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 8KNPU-E/g. Serine endoprotease that hydrolyzes internal peptide bonds. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g
06-3105	<p>Lipozyme® CALB L (9001-62-1) yellow to light-brown liq.; d. 1.2 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 5000 LU/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g
06-3140	<p>Lipozyme® TL 100 L (9001-62-1) yellow liq.; d. 1.05 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 100 KLU/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g

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06-3155	<p>Lipozyme® TL IM (9001-62-1) off-white immobilized granulate; d. 0.4 (store cold)</p> <p>Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 250 IUN/g. Lipase that hydrolyzes ester bonds in glycerides. It is a 1,3 specific lipase which is immobilized on a non-compressible silica gel carrier into an immobilized granulate. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g
06-3160	<p>Neutrase® 0.8 L (9080-56-2) brown liq.; d. 1.26 (store cold)</p> <p>Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 0.8 AU/g. Kinetic resolution of amino esters is a neutral, zinc metallo endoprotease, that randomly hydrolyzes internal peptide bonds and also facilitates enzymatic synthesis of oligopeptides by the reverse proteolysis reaction with zinc metal as co-catalyst. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g
06-3100	<p>NovoCor® AD L (9001-62-1) brown liq.; d. 1.17 (store cold)</p> <p>Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 6000 LU/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g
06-3123	<p>Novozym® 435 (9001-62-1) off-white immobilized granulate; d. 0.4 (store cold)</p> <p>Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 10000 PLU/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	5g 25g
06-3120	<p>Novozym® 40086 (9001-62-1) brown immobilized granulate; d. 0.33 (store cold)</p> <p>Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 275 IUN/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	5g 25g
06-3135	<p>Novozym® 51032 (9001-62-1) yellow to light-brown liq.; d. 1.04 (store cold)</p> <p>Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 15 KLU/g. Lipase that hydrolyzes ester bonds in glycerides. Product may be hazy and contain slight precipitate. This does not affect enzyme activity or performance. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes</p>	10g 50g 250g

BIOCATALYSTS

06-3118	Palatase® 20000 L (9001-62-1) brown liq.; d. 1.19 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 20000 LU-MM/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes	5g 25g 100g
06-3125	Resinase® HT (9001-62-1) yellow liq.; d. 1.05 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 50 KLU/g. Lipase that hydrolyzes ester bonds in glycerides. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes	10g 50g 250g
06-3137	Savinase® 12 T (9014-01-1) off-white granulate; d. 1.3 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 12 KNPU-S/g. Serine endoprotease that hydrolyzes internal peptide bonds. The granulate contains enzyme concentrate, inorganic salt, binder and coating materials. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes	10g 50g 250g
06-3150	Savinase® 16 L (9014-01-1) amber liq. (semitransparent); d. 1.16 (store cold) Note: Store at 0-10°C. DO NOT FREEZE. Declared activity 16 KNPU-S/g. A serine endoprotease that hydrolyzes internal peptide bonds. Color can vary from batch to batch. Color intensity is not an indication of enzyme activity. Packaging must be kept intact, dry and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes	10g 50g 250g

EQUIPMENT - Enzymatic Flow Reactor

96-0900 Enzymatic Flow Reactor (2.5 inch tube x 0.25 inch I.D.)
Note: In the Enzymatic Flow Reactor, enzymes are immobilized on the highly accessible surface area (>350 m²/g) of functionalized silica Nanosprings which allows for a high density enzyme loading. They don't experience flow restriction or suffer from the diffusional limitations often associated with porous substrates. See the Technical Note for more details.



1ea

BIOCATALYST KIT - CalB immo Kit - Immobilized enzyme

96-4050

CalB immo KIT™ - Immobilized enzyme

NEW

Store in dry conditions (2-8°C). Do not freeze. Shelf Life: 1 year;
Sold in collaboration with Purolite for research purposes only.

Components also available for individual sale. Contains the following:

07-3130	CalB immo Plus™ - Immobilized enzyme	10g	See page 2
07-3142	CalB immo 8285™ - Immobilized enzyme	10g	See page 1
07-3148	CalB immo 8806™ - Immobilized enzyme	10g	See page 2
07-3152	CalB immo 5587™ - Immobilized enzyme	10g	See page 1
07-3155	CalB immo 1090™ - Immobilized enzyme	10g	See page 1
07-3159	CalB immo 5872™ - Immobilized enzyme	10g	See page 1

Item #	Immobilized on	Immobilization	Enzyme activity (PLU/g dry)
07-3130	DVB/methacrylate	Adsorption	>9,000
07-3142	Epoxy/butyl methacrylate	Covelent	>10,000
07-3148	Octadecyl methacrylate	Adsorption	>10,000
07-3152	Styrene/DVB copolymer	Adsorption	>4,000
07-3155	Macroporous styrene/DVB	Adsorption	>8,000
07-3159	Styrene/DVB	Adsorption	>3,500

Appearance: White to slightly yellow spherical beads, free from foreign matter

Principal Applications: Screening of immobilized lipases for process development, Esterifications (regio- and stereo-selective), Transesterification, Amidation, Fats and oils modification

Advantages: Fast screening in process development, Wide selection of enzyme carriers for different applications

BIOCATALYST KITS - Enzyme Carrier Lifetech™ ECRKIT1

96-0255

Enzyme carrier Lifetech™ ECRKIT1

NEW

Store in dry conditions (2-20°C). Do not freeze. Shelf Life: 5 years; This enzyme carrier kit allows rapid screening of different methods of enzyme immobilization. Sold in collaboration with Purolite for research purposes only.

Components also available for individual sale. Contains the following:

06-0810	Enzyme carrier Lifetech™ ECR8204F	50g	See page 4
06-0828	Enzyme carrier Lifetech™ ECR8285	50g	See page 7
06-0913	Enzyme carrier Lifetech™ ECR1090M	50g	See page 3
06-0925	Enzyme carrier Lifetech™ ECR1030M	50g	See page 2
07-1512	Enzyme carrier Lifetech™ ECR8309F	50g	See page 4
07-1532	Enzyme carrier Lifetech™ ECR8806F	50g	See page 6

BIOCATALYST KIT - Lipase immo Kit - Immobilized enzymes

96-4065

Lipase immo Kit - Immobilized enzymes

NEW

The KIT contains 10g of each of the following:

- CalB immo Plus™ (Lipase from *Candida antarctica* B)*07-3130*
- CalA immo (Lipase from *Candida antarctica* A)
- TL immo (Lipase from *Thermomyces lanuginosa*)
- RM immo (Lipase from *Rhizomucor miehei*)
- CR immo (Lipase from *Candida rugosa*)
- PS immo (Lipase from *Pseudomonas cepacia*)

A selection of immobilized lipases on different Lifetech™ ECR enzyme carrier resins for screening purposes.

Store in dry conditions (2-8°C). Do not freeze.

Sold in collaboration with Purolite for research purposes only.

Contains the following:

Principal Applications: Esterifications (regio- and stereo-selective), Transesterification, Kinetic resolution of racemic alcohols, amines, esters and triacylglycerides, Fats and oils modification, Hydrolysis of esters

Advantages: Fast screening in process development, Wide selection of immobilized lipases, Optimal for all applications in organic solvents

BIOCATALYST KIT - Novozymes Endoprotease Screening Kit

96-0224

NEW

Novozymes Endoprotease Screening Kit (contains 6 endoprotease enzymes)

Store at 0-10°C. DO NOT FREEZE. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes
Components also available for individual sale. Contains the following:

06-3110	Alcalase® 2.4 L FG (9014-01-1)	10g	See page 1
06-3112	Alcalase® 2.5 L (9014-01-1)	10g	See page 1
06-3115	Esperase® 8.0 L (9014-01-1)	10g	See page 7
06-3137	Savinase® 12 T (9014-01-1)	10g	See page 9
06-3150	Savinase® 16 L (9014-01-1)	10g	See page 9
06-3160	Neutrase® 0.8 L (9080-56-2)	10g	See page 8

Item#	Density	Activity	Formulation	Optimal Conditions	Substrate Specificity
06-3110	1.17	2.4 AU-A/g	Liquid	30-65°C, pH 7-9	Serine endopeptidase
06-3112	1.08	2.5 AU-A/g	Liquid	30-65°C, pH 7-10	Serine endopeptidase
06-3115	1.07	8 KNPU-E/g	Liquid	pH 8-12.5	Serine endopeptidase
06-3137	1.13	12 KNPU S/g	Granulate	30-70°C, pH 8-10	Serine endopeptidase
06-3150	1.16	16 KNPU S/g	Liquid	30-70°C, pH 8-10	Serine endopeptidase
06-3160	1.26	0.8 AU/g	Liquid	40-50°C, pH 7	Metalloprotease

Optimal storage is 0-10°C/32-50°F. If stored above 25°C/77°F the samples should be used within 3 months.

BIOCATALYST KIT - Novozymes Lipase Screening Kit

96-0220

NEW

Novozymes Lipase Screening Kit (contains 9 lipase enzymes)

Store at 0-10°C. DO NOT FREEZE. Sold in collaboration with Novozymes A/S. Novozymes does not promote nor support the use of enzymes as Active Pharmaceutical Ingredients or excipients. www.strem.com/novozymes
Components also available for individual sale. Contains the following:

06-3100	NovoCor® AD L (9001-62-1)	10g	See page 8
06-3105	Lipozyme® CALB L (9001-62-1)	10g	See page 7
06-3118	Palatase® 20000 L (9001-62-1)	5g	See page 9
06-3120	Novozym® 40086 (9001-62-1)	5g	See page 8
06-3123	Novozym® 435 (9001-62-1)	5g	See page 8
06-3125	Resinase® HT (9001-62-1)	10g	See page 9
06-3135	Novozym® 51032 (9001-62-1)	10g	See page 8
06-3140	Lipozyme® TL 100 L (9001-62-1)	10g	See page 7
06-3155	Lipozyme® TL IM (9001-62-1)	10g	See page 8

Item#	Density	Activity	Formulation	Optimal Conditions	Substrate Specificity
06-3100	1.17	6000 LU/g	Liquid	30-60°C, pH 5-9	Sterically hindered esters
06-3105	1.20	5000 LU/g	Liquid	30-60°C, pH 5-9	Esters and alcohols
06-3118	1.19	20000 LU/g	Liquid	30-50°C, pH 7-10	Esters
06-3120	0.33	275 IUN/g	Immobilized Granulate	30-50°C, pH 7-10	Esters
06-3123	0.40	10000 PLU/g	Immobilized Granulate	30-60°C, pH 5-9	Esters and alcohols
06-3125	1.05	50 KLU/g	Liquid	up to 90°C, pH 5-8	Esters
06-3135	1.04	15 KLU/g	Liquid	35-70°C, pH 7-10	Esters
06-3140	1.05	100 KLU/g	Liquid	20-50°C, pH 7-10	Esters and diesters
06-3155	0.40	250 IUN/g	Immobilized Granulate	50-75°C, pH 6-8	Esters

Optimal storage is 0-10°C/32-50°F. If stored above 25°C/77°F the samples should be used within 3 months.

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