fbl fermenta

75 YEARS OF TRUST

ENZYMATIC TRANSFORMATION

GREEN CHEMISTRY

IMMOBILIZED ENZYMES & BIOCATALYSIS TECHNOLOGIES

BIOCATALYSIS CREATES
GREEN CHEMISTRY

ABOUT US:

Fermenta Biotech Limited (Fermenta), founded in 1986, is a pioneer in immobilized enzyme technology with the mission to contribute to the emerging transformation of biocatalysis. Fermenta's objective is to identify, validate, patent, and commercialize enzyme based technologies for green manufacturing. The enzyme manufacturing unit in Kullu and the DBT approved R&D facility in Thane have consistently developed and sustained Fermenta's leadership in providing advanced enzyme technologies.

PRODUCTS:

Variants of Penicillin G amidase (CAS 9014-06-6), *Thermomyces lanuginosus* lipase (CAS 9001-62-1), and *Candida antarctica* lipase (CALB) (CAS 9001-62-1) are versatile biocatalysts. CALB lipase is widely used in green fuels and chiral chemistry to catalyse specific organic transformations. These enzymes display high substrate specificity with low impurity profile suitable in aqueous, suspension and solvent phase media enabling reusability and recycibility.

FERMASE PA850

PENICILLIN G AMIDASE CATALYST

Product type

FERMASE PA850 is based on improved covalent immobilization technique of highly purified enzyme on macroporous epoxy acrylate beads. The enzyme is obtained from non-pathogenic, non-toxic *E.coli* strain with enhanced penicillin G amidase activity. It is supplied as insoluble, wet spherical beads with uniform particle size distribution.

Description

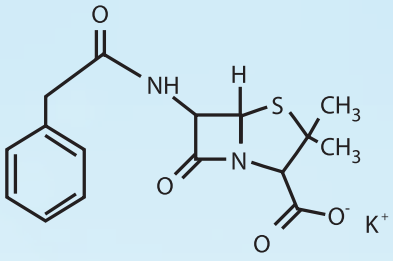
White or cream to pale yellow spherical beads with defined particle size distribution. The color may vary from batch to batch and the color intensity is not an indication of the product quality.

Advantages

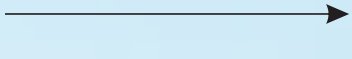
- Very high specific activity, selectivity and precision
- High operational stability & recyclability

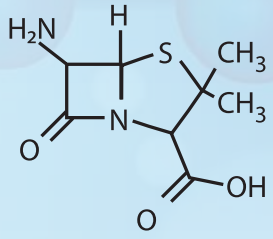
Application

Synthesis of betalactam intermediates like 6-APA, 7-ADCA, and 7-AVCA

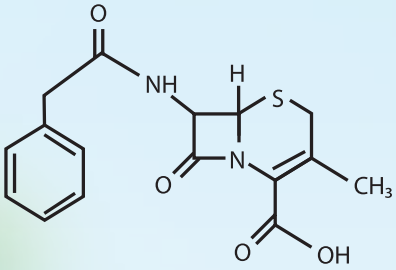


Penicillin G Potassium Salt (PenG)

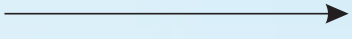


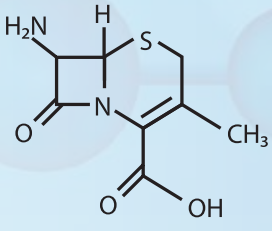


6-Amino Penicillanic Acid (6-APA)



Cephalosporin G (CephG)





7-Amino Deacetoxy Cephalosphoronic Acid (7-ADCA)

Dry weight	32-35 %
Particle size	100-500 µm > 98.0%, 50-100 µm < 2.0%
Enzyme activity	Not less than 850 U/g dry weight.
Unit definition (U/g)	Amount of enzyme catalyzing the formation of one micromole of 6- aminopenicillanic acid at 37°C, pH 8.0 at 2 % (w/v) Penicillin G initial concentration, in the milieu of 50 mM Sodium Phosphate buffer, within the range of zero order kinetics.
Storage & Product stability	Cool and dry conditions are recommended for storage. The recommended temperature for storage is between 2-8°C. When stored under these conditions, the product will maintain its declared activity for 24 months. Do not freeze!
Material support data	• Technical Data Sheet • Material Safety Data Sheet • Certificate of Analysis
Safety	**FERMASE PA850** is very safe to handle. Avoid raising dust and contact with skin and eyes. Take up spilled dust by mechanical means. Avoid forming aerosols, wash contaminated clothing & ensure sufficient ventilation.
Packing size	Bulk pack size: 20 kg
Certificates	ISO 9001:2015, ISO 14001:2015, ISO 45001:2018

Manufactured by :
Fermenta Biotech Limited
A-1501, Thane One, DIL Complex, Ghodbunder Road,
Majiwade, Thane (West) 400 610, Maharashtra, India

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FERMASE PS250

PENICILLIN G AMIDASE BIOCATALYST

Product type

FERMASE PS250 is based on improved covalent immobilization technique of highly purified Penicillin G acylase enzyme obtained from *Achromobacter sp*. on epoxy acrylate polymer beads. It is supplied as insoluble, wet spherical beads with uniform particle size distribution.

Description

Off white to pale yellow spherical beads with uniform particle size distribution. Colour may vary from batch to batch and the colour intensity is not an indication of the product quality.

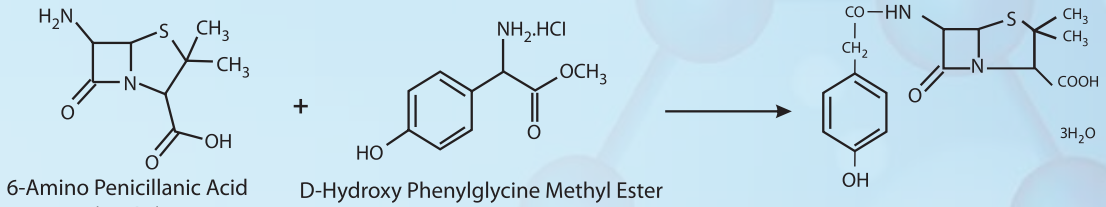
Advantages

- Higher Amoxicillin synthesis activity
- Faster reaction rate
- Longer stability
- Lower ester hydrolysis

Application

It is used for the synthesis of amoxicillin and ampicillin.

Enzymatic Amoxicillin

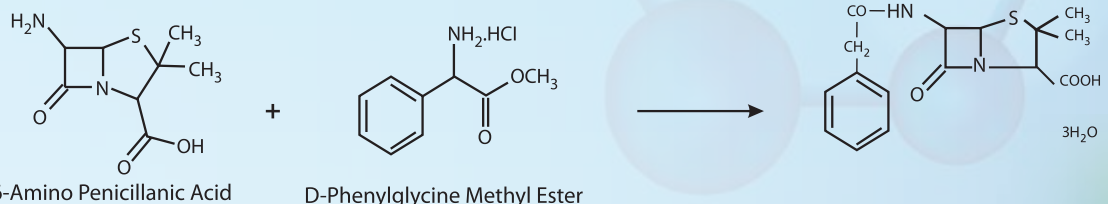


6-Amino Penicillanic Acid (6-APA)

D-Hydroxy Phenylglycine Methyl Ester Hydrochloride (HPGME.HCL)

Amoxicillin Trihydrate

Enzymatic Ampicillin



6-Amino Penicillanic Acid (6-APA)

D-Phenylglycine Methyl Ester Hydrochloride (PGME.HCL)

Ampicillin Trihydrate

Particle size	250-500 µm > 95.0 %
Enzyme activity	Penicillin G hydrolysis activity: Minimum 50.00 U/g dry weight Amoxicillin synthesis activity: Minimum 200.00 U/g dry weight
Dry weight	42.00 to 46.00 %
Unit definition (U/g)	Amount of enzyme catalyzing the formation of amoxicillin from acylation of 6-APA and 4-Hydroxyphenyl glycine methyl ester HCl in 100 mM Sodium phosphate buffer pH 6.3 at 28°C within the range of zero order kinetics.
Storage & Product stability	Cool and dry conditions are recommended for storage. The recommended temperature for storage is 2-8°C. When stored under these conditions, the product will maintain its declared activity for 24 months.
Material support data	• Technical Data Sheet • Material Safety Data Sheet • Certificate of Analysis
Safety	**FERMASE PS250** is very safe to handle. Avoid raising dust and contact with skin and eyes. Take up spilled dust by mechanical means. Avoid forming aerosols, wash contaminated clothing & ensure sufficient ventilation.
Certificates	Halal, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018

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BIOCATALYST CALB 10L

Liquid *Candida antarctica* Lipase B

Product type

Biocatalyst CALB 10L is a recombinant *Candida antarctica* lipase B enzyme expressed in *Pichia pastoris* cells. It is supplied as formulated enzyme equilibrated with buffer and permitted preservatives.

Description

Biocatalyst CALB 10L is a green, yellowish green or light brown colored liquid. Colour may vary from batch to batch and the colour intensity is not an indication of the product quality.

Advantages

- High enzymatic activity
- High stability
- Higher selectivity

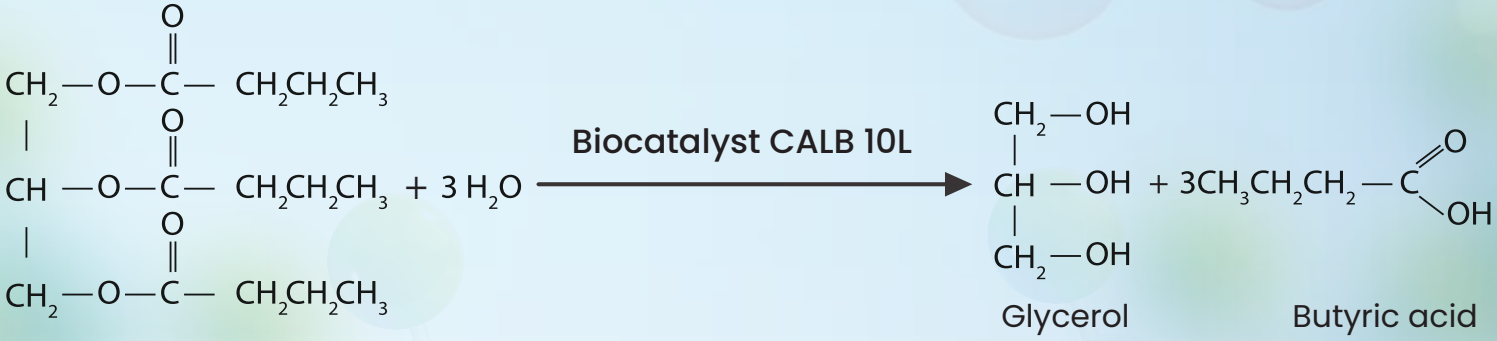
Information

Character	Value
Enzyme Activity	> 10'000 TBU/mL (Tributyrin hydrolysis)
TBU definition	Amount of enzyme catalyzing the formation of 1 µmol of butyric acid at 40°C, pH 7.5 at 10% (v/v) Tributyrin concentration per minute per mL enzyme in the milieu of 100 mM sodium phosphate buffer pH 7.5.

Application

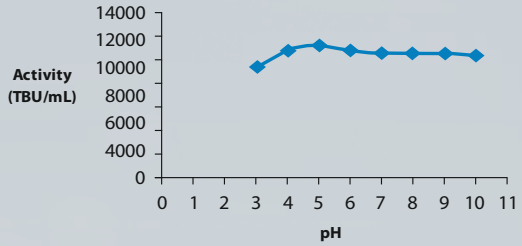
- Enantioselective hydrolysis, synthesis of esters, and amides
- Versatile applications in the APIs, pharmaceutical, food, organic chemistry, flavours and fragrances, and the production of omega-3 fatty acids.

For TBU activity

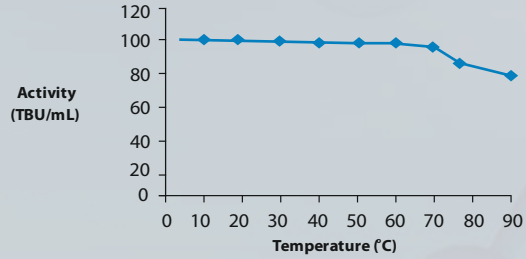


BIOCATALYST CALB 10L PROFILE

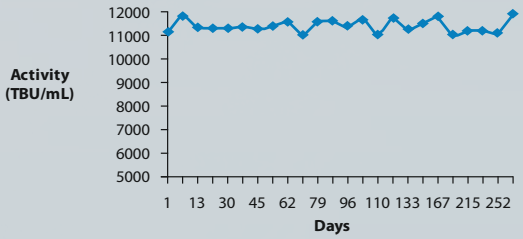
pH stability



Temperature stability



Storage stability (at 5°C)



Storage & Product stability

Cool and dry conditions are recommended for storage. The recommended temperature for storage is between 2 to 8°c.

When stored under these conditions, the product will maintain its declared activity for at least 12 months.

Safety

Biocatalyst CALB 10L is very safe to handle. Avoid generating mist contact with skin and eyes. Take up spilled liquid by mechanical means. Avoid forming aerosols, wash contaminated clothing & ensure sufficient ventilation.

Packing size

- Minimum pack size: 1 kg
- Bulk pack size: 25 kg

Certificates

Halal, Kosher, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018

Manufactured by :
Fermenta Biotech Limited
A-1501, Thane One, DIL Complex, Ghodbunder Road, Majiwade, Thane (West) 400 610, Maharashtra, India

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BIOCATALYST CALBTA10000

Candida antarctica Lipase B

Product type

Biocatalyst CALBTA10000 is a recombinant *Candida antarctica* lipase B enzyme expressed in *Pichia pastoris* cells. It is immobilized on polyacrylate beads.

Description

Biocatalyst CALBTA10000 is white or off white spherical beads with defined particle size distribution. Colour may vary from batch to batch and the colour intensity is not an indication of the product quality.

Advantages

- Chiral selectivity
- Specificity for hydrolysis and synthesis of esters and amides
- Stability in polar and non-polar solvents
- Suitability and recyclability in aqueous and biphasic reactions

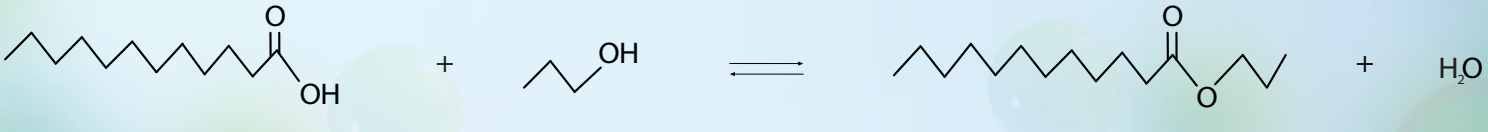
Information

Character	Value
Particle Size	300 µ to 500 µ: Minimum 98.00 %.
Enzyme Activity	> 10'000 PLU/g (Propyl laurate synthesis)
PLU definition	One PLU Enzyme unit corresponds to synthesis of 1 µmol propyl laurate per minute per gram of dry enzyme at 60°C from lauric acid and 1- propanol.

Application

- Enantioselective hydrolysis and synthesis of esters and amides, transesterification reactions
- Versatile applications in the APIs, pharmaceutical, food, organic chemistry, flavours and fragrances, and the production of omega-3 fatty acids.

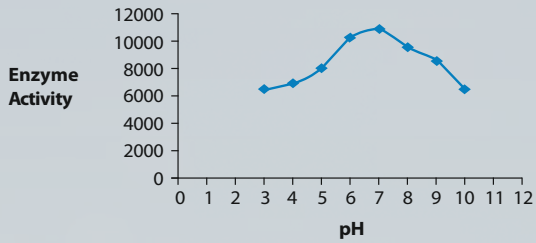
For PLU activity



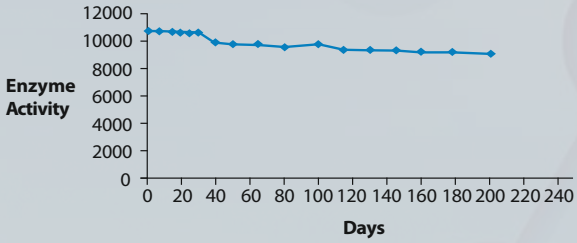
Lauric acid | Propanol | Propyl laurate | Water

Biocatalyst CALBTA10000 Profile

pH



Storage stability (at 5°C)



Storage & Product stability

Cool and dry conditions are recommended for storage. The recommended temperature for storage is between 2°C to 8°C. Do not freeze when stored under these conditions, the product will maintain its declared activity for 24 months.

Safety

Biocatalyst CALBTA10000 is very safe to handle. Avoid raising dust and contact with skin and eyes. Take up spilled dust by mechanical means. Avoid forming aerosols, wash contaminated clothing & ensure sufficient ventilation.

Packing size

- Minimum pack size: 1 kg
- Bulk pack size: 25 kg

Certificates

Halal, Kosher, ISO 9001:2015,
ISO 14001:2015, ISO 45001:2018

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BIOCATALYST TL 15L

Thermomyces lanuginosus Lipase

Product type

Biocatalyst TL 15L is recombinant *Thermomyces lanuginosus* lipase enzyme expressed in *Pichia pastoris* cells supplied as formulated enzyme solution in buffer with permitted stabilizers and preservatives.

Description

Biocatalyst TL 15L is green, yellowish green or light brown colored liquid. Color intensity may vary from batch to batch, and intensity is not indicative of product quality.

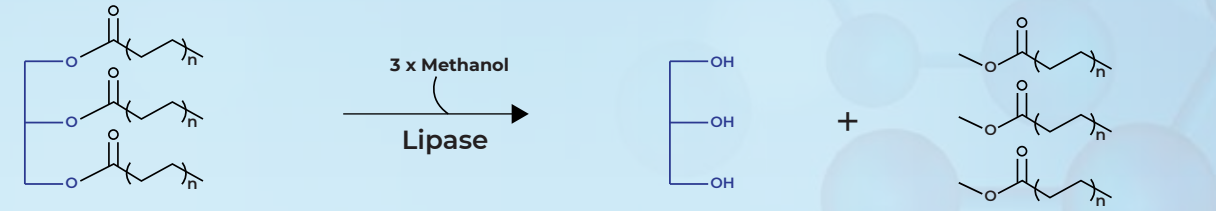
Advantages

- Suitability of use in saturated and unsaturated oils
- Specific for the transesterification and hydrolysis reactions in various oils
- Most suitable for biodiesel application

Application

1. Transesterification

Example: Biodiesel, Ethyl esters, Glycerol esters.



Triacylglycerol (Oil) | Glycerol | Fatty Acid Methyl Ester (FAME)

Key advantages of Enzyme use in biodiesel

PARAMETERS	CHEMICAL	ENZYMATIC
Methanol Quantity	40-50%	25-30%
Methanol Recovery	Required	Not Required
Sulphuric acid	Used	Not used
By Product	Soap formation	None
Glycerin coloration	Coloured	Clean
Glycerin purity	Less pure	Pure
Temperature (° C)	80	35-40
Caustic requirement	More	Minimal

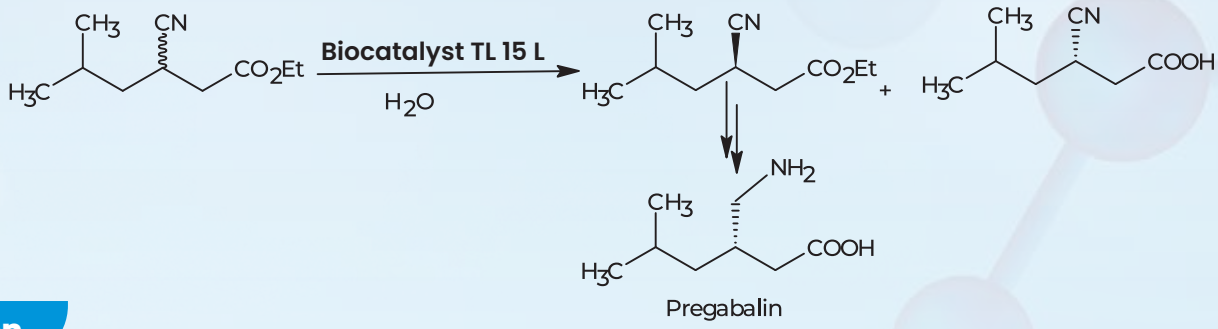
2. Hydrolysis

Reaction chemistry: Hydrolysis of triglycerides in oil to form corresponding fatty acids and glycerin. E.g. Castor oil fatty acids (COFA).

Triacylglycerol (Oil) | Fatty acid | Glycerine

3. API intermediates

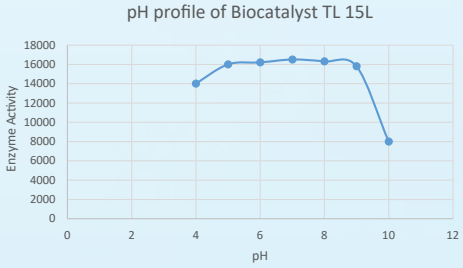
E.g. Pregabalin

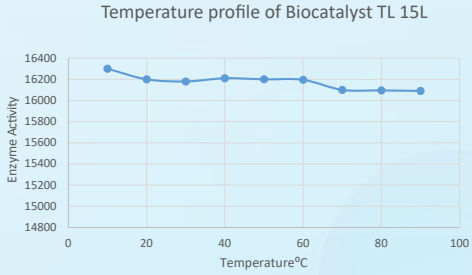


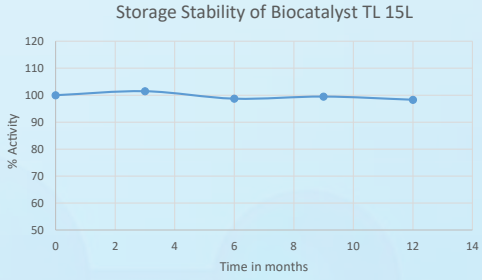
Information

CHARACTER	VALUE
Enzyme Activity	NLT 15000 TBU/mL (Tributyrin hydrolysis)
TBU definition	Amount of enzyme catalyzing the formation of 1 µmol of butyric acid at 40°C, pH 7.5 at 10% (W/V) Tributyrin concentration per minute per ml. enzyme in the milieu of 100 mM sodium phosphate buffer pH 7.5.

Biocatalyst TL 15 L Profile







Storage & Product stability

Cool and dry conditions are recommended for storage. The recommended temperature for storage is between 2°C to 8°C. When stored under these conditions, the product will maintain its declared activity for at least 12 months.

Safety

Biocatalyst TL 15 L is very safe to handle. Avoid generating mist and contact with skin and eyes. Take up spilled liquid by mechanical means. Avoid forming aerosols, wash contaminated clothing & ensure sufficient ventilation.

Packing size

- Minimum pack size: 1 kg
- Bulk pack size: 25 kg

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FBL/GCH/PSI/05/26/01

CERTIFICATIONS & ACCEREDITATIONS

ISO 14001:2015

ISO 9001:2015

ISO 45001:2018

KLBD

JAMIAT ULAMA HALAL FOUNDATION
حلال
HALAL
0376

*Product / Site Specific

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