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Vitamin D, Vitamin D Analogues,
Cholesterol and Lanolin Alcohols

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ALFACALCIDOL PhEUR

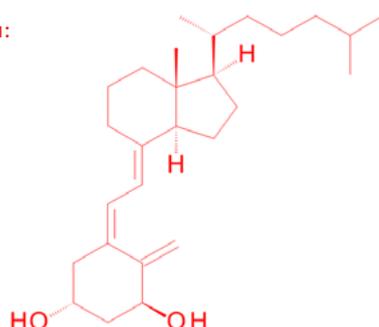
(1 α -Hydroxycholecalciferol)

Alfacalcidol is a vitamin D3 analog for the Pharmaceutical and Veterinary industry. Alfacalcidol is especially used to prevent and treat osteoporosis or decalcification of bones. The substance is also active against other bone growth disorders such as osteomalacia, rickets and specific liver and parathyroid glands abnormalities. It is also used for the treatment and prevention of secondary hyperparathyroidism associated with chronic kidney disease.

Dishman manufactures this API under cGMP regime at its HIPO manufacturing facilities in Veenendaal, the Netherlands.

Specification: Chemical name: Alfacalcidol, 1 α -hydroxycholecalciferol, 1 α -hydroxyvitamin D3
Alfacalcidol is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 41294-56-8

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical and Veterinary industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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CALCIFEDIOL PhEUR/USP

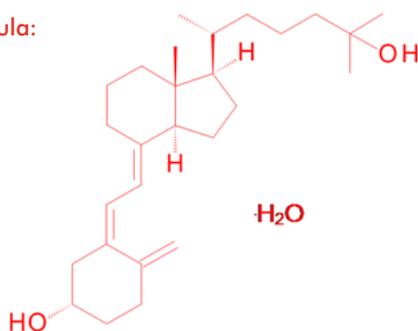
(25-Hydroxycholecalciferol)

Calcifediol is a vitamin D3 analog for the Pharmaceutical and Veterinary industry. Calcifediol is especially used to prevent and treat osteoporosis or decalcification of bones. The substance is also active against other bone growth disorders such as rickets, osteomalacia and specific liver and parathyroid glands abnormalities. It is also used for the treatment and prevention of secondary hyperparathyroidism associated with chronic kidney disease.

Dishman manufactures this API under cGMP regime at its HIPO manufacturing facilities in Veenendaal, the Netherlands.

Specification: Chemical name: Calcifediol, 25-hydroxycholecalciferol, 25-hydroxyvitamin D3
Calcifediol is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 63283-36-3 (monohydrate), 19356-17-3 (anhydrous)

Toxic classification: Harmful (category Xn). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date DMF and CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical and Veterinary industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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CALCITRIOL PhEUR/USP

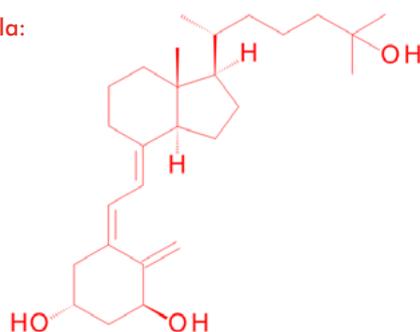
(1 α ,25- Dihydroxycholecalciferol)

Calcitriol is a vitamin D3 analog for the Pharmaceutical and Veterinary industry. Calcitriol is especially used to prevent and treat osteoporosis or decalcification of bones. The substance is also active against other bone growth disorders such as osteomalacia, rickets and specific liver and parathyroid glands abnormalities.

Dishman manufactures this API under cGMP regime at its HIPO manufacturing facilities in Veenendaal, the Netherlands.

Specification: Chemical name: Calcitriol, 1 α ,25-dihydroxycholecalciferol, 1 α ,25-dihydroxyvitamin D3
Calcitriol is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 32222-06-3

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date DMF and CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical and Veterinary industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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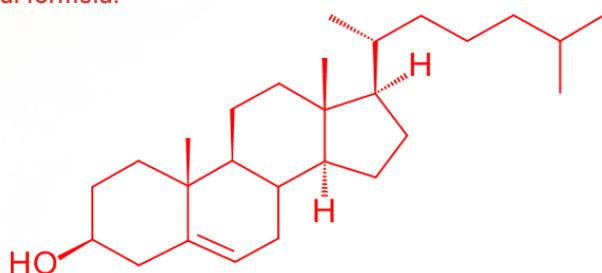
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CHOLESTEROL HP

Cholesterol HP is made from wool grease by extraction and refining processes. Cholesterol HP is soluble in most common organic solvents and vegetable oils but insoluble in water.

Specification: Cholesterol HP is a white crystalline powder
Cholesterol (GC), 99.0 - 101.0%
Total sterol (GC), $\geq 99.5\%$

•• **Structural formula:**



CAS no. 57-88-5

Regulatory: Cholesterol HP is made under cGMP regime. We have an up to date DMF and CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Cholesterol HP is used in liposomal formulations. It enables controlled release by encapsulation of drugs/actives in injectables and it can be used as a carrier for diagnostic substances. Cholesterol HP has excellent emulsifying properties and can be used to enable transdermal transport.

Packing: Aluminum laminated bags of 1 kg, packed under nitrogen.

Storage: To avoid contamination keep the bags well closed.

Stability: Retest after 5 years if kept in the original, unopened packing in a cool dry place. After opening the material is stable for 1 year at room temperature.

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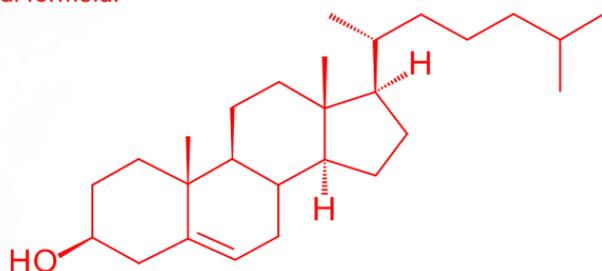
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CHOLESTEROL NF

Cholesterol NF is a white, crystalline powder. It is made from wool grease by extraction and refining processes. Cholesterol NF is soluble in most common organic solvents and vegetable oils but insoluble in water.

Specification: Cholesterol (GC), $\geq 95\%$
Total sterol (GC), $\geq 99\%$
A-tocopherol, 50-350ppm (anti-oxidant)

•• **Structural formula:**



CAS no. 57-88-5

Application: Cholesterol NF is widely used as an emulsifying agent in cosmetic preparations. Cholesterol functions as an excellent moisturizer in skin conditioning cosmetics and is used as a raw material for the synthesis of vitamin D3 and liquid crystals.

Packing: Fibre drums containing 10, 25 or 50 kg net in plastic foil.

Storage: To avoid contamination keep the drums well closed.

Stability: Retest after 3 years, if stored at ambient temperature in original undamaged packing.

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CHOLESTEROL SF

Cholesterol SF is a slightly off-white powder. It is made from wool grease by extraction and refining processes. Cholesterol SF is insoluble in water. The product consists of cholesterol and approximately 1% Aerosil to improve flowability.

Specification:	Cholesterol (GC), $\geq 91\%$ Total sterol (GC), $\geq 97\%$ A-tocopherol, $\geq 50\text{ppm}$ (anti-oxidant)
CAS no.	57-88-5
Application:	As an additive for shrimp feed Cholesterol is an essential molecule for the synthesis of molting hormones, sex hormones, bile acids, vitamin D and is a building block of shrimp tissues. Cholesterol cannot be metabolized by the shrimp and has therefore to be added to the shrimp feed.
Particle size:	100% < 1000 microns 98% < 500 microns 80% < 250 microns
Formulation:	Recommended inclusion rate: -Larval feed: 1% -Shrimp feed: 0.3-0.5% depending on growth stage Cholesterol should be added before extrusion, together with other fatty compounds.
Packing:	Fibre drums containing 50 kg net in plastic foil.
Storage:	To avoid contamination keep the drums well closed.
Stability:	Retest after 3 years, if stored at ambient temperatures in original undamaged packing.

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CHOLESTEROL XG

Cholesterol XG is a slightly off-white powder. It is made from wool grease by extraction and refining processes. Cholesterol XG is insoluble in water. The product consists of cholesterol and contains 10-13% Inducal (CaCo3). Approximately 1% Aerosil is added to improve flowability.

Specification:	Cholesterol (GC), ≥ 80% Total sterol (GC), typical 85% A-tocopherol, ≥ 50ppm (anti-oxidant)
CAS no.	57-88-5
Application:	As an additive for shrimp feed Cholesterol is an essential molecule for the synthesis of molting hormones, sex hormones, bile acids, vitamin D and is a building block of shrimp tissues. Cholesterol cannot be metabolized by the shrimp and has therefore to be added to the shrimp feed.
Packing:	Fibre drums containing 50 kg net in plastic foil.
Storage:	To avoid contamination keep the drums well closed.
Stability:	Retest after 3 years, if stored at ambient temperatures in original undamaged packing.

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DIHYDROTACHYSTEROL PhEUR/USP

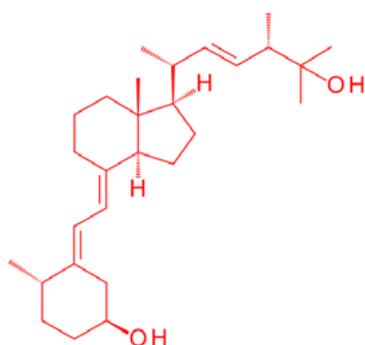
(DHT-2 or Dihydrotachysterol-2)

Dihydrotachysterol-2 (DHT-2) is a vitamin D2 analog for the Pharmaceutical industry. Dihydrotachysterol-2 is used in the prevention and treatment of several bone growth disorders such as osteoporosis. Besides this the substance is also used to treat several abnormalities of the parathyroid glands such as hypoparathyroidism.

Our Dihydrotachysterol-2 is made under cGMP regime. Dishman supplies this API from Veenendaal, the Netherlands.

Specification: Chemical name: Dihydrotachysterol-2, DHT-2
Dihydrotachysterol-2 is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 67-96-9

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date DMF and a CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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DOXERCALCIFEROL OR ERCALCIDOL

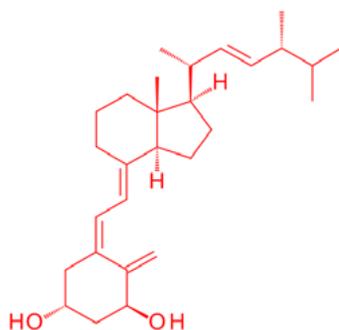
(1 α -Hydroxyergocalciferol)

Doxercalciferol is an active Vitamin D analog for the Pharmaceutical industry. Doxercalciferol is used for the treatment and prevention of secondary hyperparathyroidism associated with chronic kidney disease. It has been shown to reduce parathyroid hormone levels by inhibiting its synthesis and secretion.

This product is in development. Dishman can produce this API under cGMP regime at its HIPO manufacturing facilities in Veenendaal, the Netherlands.

Specification: Chemical name: Doxercalciferol, 1 α -hydroxyergocalciferol, Ercalcidol
Doxercalciferol is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 54573-75-0

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: Our Doxercalciferol can be made under cGMP regime. Besides this we can arrange an up to date DMF and a technical package with full regulatory support.

Application: Pharmaceutical industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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LANOLIN ALCOHOL

Dusoran

Dusoran[®] is a yellowish, waxy solid. Dusoran[®] is a purified mixture of sterols (Cholesterol, Lanosterol, Desmosterol and numerous other sterols) and aliphatic alcohols and diols (C18-C32), branched and non-branched. Dusoran[®] is soluble in mineral oils, ethanol, chloroform, diethylether, light petroleum ether and toluene. It is insoluble in water. Dusoran[®] is obtained by molecular distillation of saponified Lanolin. Supplied in pellet format.

Specification:	Saponification value (mgKOH/g):	≤ 10
	Acid value (mgKOH/g):	≤ 5
	Color (Gardner) 22.5 g/100 ml:	≤ 10
	Cholesterol (GC):	8 – 13%
	Dropping point:	50 - 80°C
	Melt behaviour:	clear melt at 90 °C

Use: Dusoran is ideal for use in hair colourants, hair conditioners, hair treatment (relaxing and perming), 2 in 1 hair combination products etc. In skincare applications, Dusoran can be used in both facial and body care.

Benefits: Dusoran contributes to the performance for hair colourants, hair conditioners, hair treatment - (relaxing and perming), 2 in 1 hair combination products etc. Its key products benefits for haircare are:

- Volume
- Gloss
- Prevention (premature oily hair)
- Protection - head irritation
- Excellent Sensory properties

In skincare applications, Dusoran can be used in both facial and body care. For skincare its key product benefits are:

- Moisture control
- Controlled transdermal transport
- Protection
- Convenience
- Sensory characteristics

Packing: Carton box with inliner containing 20 kg net.

Stability: Dusoran is stable for at least one year.

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PARICALCITOL USP

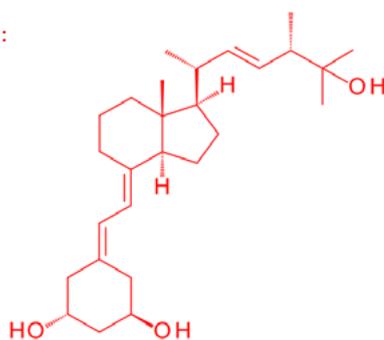
(19-NOR-1 α ,25-dihydroxyergocalciferol)

Paricalcitol is an active Vitamin D analog for the Pharmaceutical industry. Paricalcitol is used for the treatment and prevention of secondary hyperparathyroidism associated with chronic kidney disease. It has been shown to reduce parathyroid hormone levels by inhibiting its synthesis and secretion.

Dishman manufactures this API under cGMP regime at its HIPO manufacturing facilities in Veenendaal, the Netherlands.

Specification: Chemical name: Paricalcitol, 19-NOR-1 α ,25-dihydroxyergocalciferol
Paricalcitol is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 131918-61-1

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date DMF and ASMF. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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SECALCIFEROL

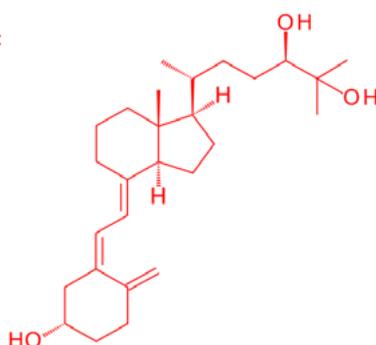
(24R, 25-Dihydroxycholecalciferol)

Secalciferol is an active Vitamin D analog for the Pharmaceutical industry. Secalciferol can be used for the treatment of disorders in Calcium and Phosphor homeostasis. It can also be used as a marker for Vitamin D3 catabolism and a predictor of serum 25-hydroxycholecalciferol response to Vitamin D3 supplementation.

This product is in development. Dishman can already supply non-GMP R&D material of this API. Dishman can produce this API under cGMP regime at its HIPO manufacturing facilities in Veenendaal, the Netherlands.

Specification: Chemical name: Secalciferol, 24R,25-dihydroxycholecalciferol, 24R,25-dihydroxyvitamin D3, 24R 25 DHCC
Secalciferol is a white, or almost white, crystalline substance.
Purity is 97-102%

•• **Structural formula:**



CAS no. 55721-11-4

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Application: Pharmaceutical industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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VITAMIN D2 PURE

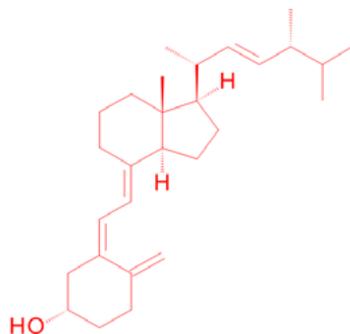
Ergocalciferol PhEur/USP

Vitamin D2 is used to ensure the right concentration of calcium and phosphorus in the blood. Ergocalciferol is used to treat and prevent bone growth disorders such as osteomalacia, rickets and osteoporosis. Recent research shows that vitamin D2 can also be of paramount importance to prevent other abnormalities and diseases as well. Several forms of cancer and auto-immune diseases are targeted by several research companies.

The Ergocalciferol PhEur/USP is made under cGMP regime in the European Union. Dishman supplies this API from Veenendaal, the Netherlands.

Specification: Chemical name: Ergocalciferol, Vitamin D2, Calciferol
Ergocalciferol is a white, or almost white, crystalline substance
Purity is 97-102%
1 gram is equivalent to 40,000,000 IU of Vitamin D2.

•• **Structural formula:**



CAS no. 50-14-6

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date DMF and ASMF. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical and Veterinary industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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VITAMIN D3 PURE

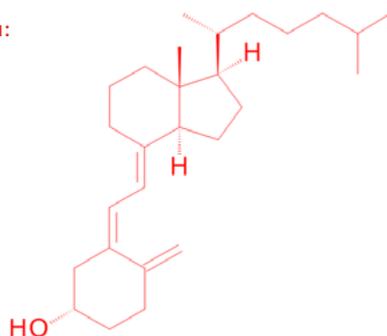
Cholecalciferol PhEur/USP

Vitamin D3 ensures the correct concentration of calcium and phosphorus in the blood. It is used to treat and/or prevent bone growth disorders such as osteomalacia, rickets and osteoporosis. Recent research shows that vitamin D3 might also be of paramount importance to prevent other abnormalities and diseases as well. Several forms of cancer and auto-immune diseases are targeted by several research companies.

Our Cholecalciferol PhEur/USP is made under cGMP regime in the European Union. Dishman supplies this API from Veenendaal, the Netherlands.

Specification: Chemical name: Cholecalciferol, Vitamin D3
Cholecalciferol is a white, or almost white, crystalline substance
Purity is 97-102%
1 gram is equivalent to 40,000,000 IU of Vitamin D3.

• **Structural formula:**



CAS no. 67-97-0

Toxic classification: Very toxic (category T+). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date DMF and CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical and Veterinary industry. Suitable for drug formulation including tablets, injectables, oral solutions and soft gel capsules.

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VITAMIN D3 IN OIL

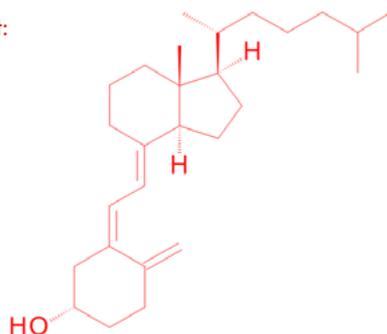
Dohyfral D3 2000AG or
Cholecalciferol concentrate,
oily form PhEur

Vitamin D3 ensures the correct concentration of calcium and phosphorus in the blood. It is used to treat and prevent bone growth disorders such as osteomalacia, rickets and osteoporosis. Recent research shows that vitamin D3 might also be of paramount importance to prevent other abnormalities and diseases as well. Several forms of cancer and auto-immune diseases are targeted by several research companies.

Our Cholecalciferol concentrate, oily form PhEur is made under cGMP regime in the European Union. Dishman supplies this API from Veenendaal, the Netherlands.

Specification: Chemical name: Cholecalciferol concentrate, Vitamin D3 in oil
Dohyfral D3 2000 AG is a clear yellow liquid
Purity is 4.5-5.5% in vegetal oil
1 gram is equivalent to 2,000,000 IU of Vitamin D3.

•• **Active component:**



CAS no. 67-97-0

Toxic classification: Toxic (category T). Before handling this substance, read the special directions on the label and Safety Data Sheet (available upon request).

Regulatory: We have an up to date CoS/CEP. We can also offer a technical package with full regulatory support.

Application: Pharmaceutical and Veterinary industry. Suitable for drug formulation including tablets and soft gels.

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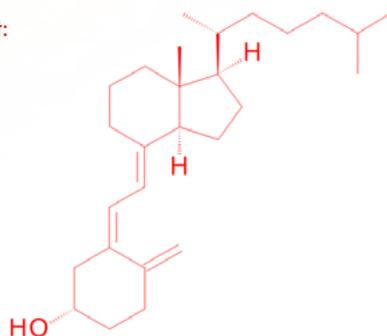
VITAMIN D3-500

(feed grade)

D3-500 is a white to yellowish colored powder, based on fully hydrogenated vegetable oils with vitamin D3 resin and stabilized with BHT as an antioxidant.

Specification: 500,000 IU/g Vitamin D3
98% ≤ 500 μm (particle size)

•• **Active component:**



CAS no. 67-97-0

Toxic classification: Vitamin D3-500 is classified as a dangerous substance. Before handling this product, read the special directions on the label and the Safety Data Sheet (available upon request).

Application: Used for animal nutrition in premixes, liquid diet, milk replacers and compound feeds.

Packing: 20 kg in a paper bag lined with PE.

Storage: The content is guaranteed for at least 1 year, provided the product has been stored in the original, undamaged and unopened packing in a cool dry place away from light and at ambient temperature. Once opened, contents should be used within a reasonable time.

Precautions: This product is safe for the intended use. Avoid ingestion, inhalation of dust or direct contact by using suitable personal hygiene and protective measures. If swallowed please seek medical advice and show this bulletin, label or container

Certification: GMP+ and FAMI-QS

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The Dishman group is a global, multi-site, multi-location organisation, offering our customers a comprehensive range of chemical and manufacturing solutions from a single supplier. This extends from rapid supply of development scale Active Pharmaceutical Ingredients (API) through to large-scale manufacture of intermediates, API, Highly Potent API and fine chemicals. Dishman provides manufacturing excellence in cGMP-compliant and USFDA-inspected facilities in Europe, China, and India, with local support in all major markets. Dishman is the global outsourcing partner of choice for the pharmaceutical industry with innovative development, life cycle management and cost-effective commercial supply through economies of scale and locations.

Dishman manufactures and supplies a range of Vitamin D, Vitamin D analogs, Cholesterol, and Lanolin Alcohol products for pharmaceutical, cosmetic, feed, food, shrimp farming and industrial applications.