Fish Oil Purification Process

The fish oil used in **TriCare Prenatal™ DHA ONE®** is subjected to a patented, multi-step process called Epax® to effectively remove contaminants, concentrate the essential fatty acid components, (DHA and EPA), and eliminate any unpleasant odor or taste.

At the start, crude fish oils are carefully analyzed for pesticides and heavy metals, and only those with levels below accepted safety standards are accepted. **The oils are then subjected to a 9 step process, with 4 stages of molecular distillation, along with stripping, filtering, deodorization, concentration, and addition of vitamin E antioxidants.** At the end of the processing, the oil is packaged into never reused steel drums and blanketed with nitrogen. This protects the processed fish oil from oxidation.

In addition, the production of the DHA ONE® softgels is accomplished in an oxygen-free environment to further protect the fish oil from oxidation. The softgels used are of the highest quality available and provide an air-tight barrier. They are manufactured by *Catalent Pharma Solutions*, the company that invented softgel technology. TriCare PrenatalTM DHA ONE® also contains lemon oil to further protect the ultra-purified fish oil from oxidation.

With all of these factors, you can be sure that **TriCare Prenatal[™] DHA ONE**® is free of contaminants and will not plague you with fishy odor, taste, or aftertaste. The diagram below outlines the **Epax**® process.



Production Process Chart EPAX 6000 TG/N

		Starting Material - Crude fish oils are analyzed and controlled for pesticides and heavy metals		
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Sodium Hydroxide	\rightarrow	Deacidification - Free fatty acids are removed as sodium soaps by mixing with aqueous sodium hydroxide solution. The sodium soaps are removed in a separator, washed with water and continuously dried under vacuum at a temperature not exceeding 100° C.	\rightarrow	Soap
		Stripping - Pollutants are removed in a distillation unit running using a patent process. The process effectively reduces the level of PCB's, pesticides and heavy metals. The level of pollutants retained in the product is close to or under detectable levels.	\rightarrow	Pollutants
		\downarrow		
Ethanol	\rightarrow	Ethyl esterification - Ethyl esters are made by treating triglyceride with non-aqueous ethanol and a chemical catalyst (sodium methylate). Glycerol is drained off, excess ethanol recovered and the esters are washed with water and vacuum dried.	\rightarrow	Glycerol, Ethanol
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		Distillation - The ethyl ester is distilled under vacuum in a short-path evaporator. In order to achieve the specified concentration, the distillate may be subjected to further distillation using the same process.	\rightarrow	Light Fraction Ethyl Esters
		\downarrow		
Glycerol	\rightarrow	Transesterification - The ethyl ester is reconverted to triglycerides by esterification with glycerol using an enzyme catalyst. The reaction is performed at temperatures below 100°C.	\rightarrow	Ethanol
		\downarrow		
		Upgrading - A unique process utilizing distillation in a specific sequence to decrease the level of monoglycerides, diglycerides and ethyl esters. The upgrading step has been specially developed by Epax and delivers a triglyceride content of at least 90%.		
		\downarrow		



Bleaching Earth \longrightarrow	Bleaching and filtering - Bleaching earth (natural clay) is added to the oil and the oil is filtered to remove the bleaching earth together with coulour components and oxidation products. This step reduces the peroxide and anisidine values and gives a clear and light yellow oil.	\rightarrow	Bleaching Rest		
Mixed Tocopherols \longrightarrow	Peodorisation - Steam distillation is performed under vacuum. The steam absorbs volatile components which are then removed under vacuum. The volatile components which contribute to bad smell and taste in the oil are effectively removed by this process. Mixing and addition of antioxidants - Antioxidants in the form of natural mixed tocopherols and/or d-alpha-tocoperol are added according to the specifications. A combination of mixed tocopherols and d-alpha-tocoperol are used unless otherwise specified. The antioxidants used are IP certified as GMO free. Packaging - The oil is filled into new steel drums and nitrogen blanketed. The drums used for EPAX products are never reused. The shelf life for EPAX products is two years when stored in an unopened drum at or below 25°C.				
EPAX 6000 IG/N					