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Fish Oil Containing Omega-3 Acids Delayed-Release Capsules

DEFINITION

Fish Oil Containing Omega-3 Acids Delayed-Release Capsules are enteric-coated Capsules that contain NLT 95.0% and NMT 105.0% of the labeled amount of Fish Oil Containing Omega-3 Acids where Fish Oil Containing Omega-3 Acids is the purified, winterized, and deodorized fatty oil obtained from fish of the families Engraulidae, Carangidae, Clupeidae, Osmeridae, Scombridae, and Ammodytidae. The omega-3 acids are defined as the following: alpha-linolenic acid (C18:3 n-3), moroctic acid (C18:4 n-3), eicosatetraenoic acid (C20:4 n-3), eicosapentaenoic acid (EPA) (C20:5 n-3), heneicosapentaenoic acid (C21:5 n-3), docosapentaenoic acid (C22:5 n-3), and docosahexaenoic acid (DHA) (C22:6 n-3). It contains NLT 28.0% (w/w) of total omega-3 acids, expressed as free acids, consisting of NLT 13.0% of EPA and NLT 9.0% of DHA. Suitable antioxidants in appropriate concentrations may be added.

IDENTIFICATION

• **A.** The oil contained in the Capsules meets the requirements for the following test. The retention times of the docosahexaenoic acid methyl ester and eicosapentaenoic acid methyl ester peaks of *Test solution 1* in *Content of EPA and DHA* correspond to those of the docosahexaenoic acid methyl ester and eicosapentaenoic acid methyl ester peaks of *Standard solution 2a* and *Standard solution 2b*, respectively, in [Fats and Fixed Oils \(401\), Procedures, Omega-3 Fatty Acids Determination and Profile, Content of EPA and DHA](#). The sum of the area for EPA and DHA methyl esters is NLT 22% of the total detected area for the methyl esters, and no other peak has an area higher than 20% of the total detected area for the methyl esters. In addition to the EPA and DHA peaks, *Test solution 1* exhibits at least 15 more peaks with retention times similar to those of the *Fish oil standard solution*, as obtained in *Content of EPA and DHA*.

STRENGTH

• CONTENT OF FISH OIL

Analysis: Weigh NLT 10 Capsules in a tared weighing bottle, carefully open the Capsules, without loss of shell material, and transfer the combined Capsule contents to a 100-mL beaker. Remove any adhering substance from the emptied Capsules by washing with several small portions of [2,2,4-trimethylpentane](#). Discard the washings, and allow the empty Capsules to dry in a current of dry air until the 2,2,4-trimethylpentane is completely evaporated. Weigh the empty Capsules in the original tared weighing bottle, and calculate the average net weight per Capsule.

Acceptance criteria: 95.0%–105.0% of the labeled amount

• CONTENT OF EPA AND DHA

(See [Fats and Fixed Oils \(401\), Procedures, Omega-3 Fatty Acids Determination and Profile](#).)

System suitability solution 1, System suitability solution 2, Standard solution 1a, Standard solution 1b, Standard solution 2a, Standard solution 2b, Test solution 1, Test solution 2, Chromatographic system, System suitability, and Analysis: Proceed as directed in [Fats and Fixed Oils \(401\), Procedures, Omega-3 Fatty Acids Determination and Profile, Content of EPA and DHA](#) for triglycerides.

Fish oil standard solution: Transfer 300 mg of [USP Fish Oil RS](#) to a 10-mL volumetric flask, and dissolve in and dilute with *Antioxidant Solution* to volume. Proceed as directed for *Test Solution 1 (for triglycerides)* in [Fats and Fixed Oils \(401\), Procedures, Omega-3 Fatty Acids Determination and Profile, Content of EPA and DHA](#), starting with "Transfer 2.0 mL".

Identify the relevant fatty acid methyl esters in the *Fish oil standard solution* by comparing their retention times with those in the reference chromatogram supplied with the [USP Fish Oil RS](#).

Calculate the percentage of EPA and DHA in the portion of fish oil containing omega-3 acids taken from the Capsules.

Acceptance criteria: NLT 13.0% (w/w) of EPA and NLT 9.0% (w/w) of DHA

• CONTENT OF TOTAL OMEGA-3 ACIDS

(See [Fats and Fixed Oils \(401\), Procedures, Omega-3 Fatty Acids Determination and Profile](#).)

Analysis: Proceed as directed in [Fats and Fixed Oils \(401\), Procedures, Omega-3 Fatty Acids Determination and Profile, Content of total omega-3 acids \(for triglycerides\)](#).

Acceptance criteria: NLT 28.0% (w/w) of total omega-3 acids, expressed as free acids

PERFORMANCE TESTS

- [DISINTEGRATION AND DISSOLUTION \(2040\)](#): Meet the requirements for *Disintegration, Procedure, Delayed-release (enteric-coated) soft-shell capsules*
- [WEIGHT VARIATION OF DIETARY SUPPLEMENTS \(2091\)](#): Meet the requirements

CONTAMINANTS

• [FATS AND FIXED OILS \(401\), Procedures, Trace Metals](#): NMT 0.1 ppm each of Pb, Cd, As, and Hg

Change to read:

• **LIMIT OF DIOXINS, FURANS, AND POLYCHLORINATED BIPHENYLS**

Analysis: Determine the content of polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) ▲ using the current revision of ▲ (USP 1-Dec-2022) Method 1613 ▲ (USP 1-Dec-2022) of the Environmental Protection Agency. Determine the content of polychlorinated biphenyls (PCBs) ▲ using the current revision of ▲ (USP 1-Dec-2022) Method 1668 ▲ (USP 1-Dec-2022) of the Environmental Protection Agency.

Acceptance criteria: The sum of PCDDs and PCDFs is NMT 2.0 pg/g of World Health Organization (WHO) toxic equivalents. The sum of PCDDs, PCDFs, and dioxin-like PCBs (polychlorinated biphenyls, non-ortho IUPAC congeners PCB-77, PCB-81, PCB-126, and PCB-169, and mono-ortho IUPAC congeners PCB-105, PCB-114, PCB-118, PCB-123, PCB-156, PCB-157, PCB-167, and PCB-189) is NMT 10.0 pg/g of WHO toxic equivalents.

SPECIFIC TESTS

- **FATS AND FIXED OILS** (401), [Procedures, Acid Value](#): NMT 3
- **FATS AND FIXED OILS** (401), [Procedures, Anisidine Value](#): NMT 20.0
- **FATS AND FIXED OILS** (401), [Procedures, Peroxide Value](#): NMT 5.0
- **FATS AND FIXED OILS** (401), [Procedures, Total Oxidation Value \(TOTOX\)](#): NMT 26, calculated:

$$\text{Result} = (2 \times \text{PV}) + \text{AV}$$

PV = peroxide value

AV = anisidine value

- **FATS AND FIXED OILS** (401), [Procedures, Unsaponifiable Matter](#): NMT 1.5%
- **STEARIN**: 10 mL remains clear after cooling at 0° for 3 h.
- **ABSORBANCE**

Sample solution: 0.24 mg/mL in [isooctane](#)

Acceptance criteria: NMT 0.70, determined at 233 nm

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in tight containers, and store at room temperature, protected from light.
- **LABELING:** The label states the amount of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) in mg per Capsule.

• USP REFERENCE STANDARDS (11)

[USP Docosahexaenoic Acid Ethyl Ester RS](#)

All *cis*-4,7,10,13,16,19-docosahexaenoic ethyl ester.

$\text{C}_{24}\text{H}_{36}\text{O}_2$ 356.55

[USP Eicosapentaenoic Acid Ethyl Ester RS](#)

All *cis*-5,8,11,14,17-eicosapentaenoic ethyl ester.

$\text{C}_{22}\text{H}_{34}\text{O}_2$ 330.51

[USP Fish Oil RS](#)

[USP Methyl Tricosanoate RS](#)

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
FISH OIL CONTAINING OMEGA-3 ACIDS DELAYED-RELEASE CAPSULES	Natalia Davydova Scientific Liaison	NBDS2020 Non-botanical Dietary Supplements
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	NBDS2020 Non-botanical Dietary Supplements

Chromatographic Database Information: [Chromatographic Database](#)

Most Recently Appeared In:

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