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## NSF International Standard for Dietary Supplements — Dietary supplements

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### 5.3.6 Industrial Contaminants

For ingredients and products containing natural fish oil, manufacturers shall have controls in place to screen for polychlorinated biphenyls (PCBs), polychlorinated dibenzo-*para*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and dioxin-like PCBs in the oil ingredient.

The content of dioxins and furans expressed as the sum of PCDDs and PCDFs shall not exceed 2 pg WHO-TEQ per gram of oil, dioxin-like PCBs shall not exceed 3 pg WHO-TEQ per gram of oil, and total PCBs shall not exceed 0.09 mg/kg of oil (w/w).<sup>1</sup> Total PCBs shall, at a minimum, include IUPAC congeners 28, 52, 101, 118, 138, 153, and 180.

Ingredients and products containing glycerin shall be tested for diethylene glycol contamination. Diethylene glycol shall not exceed 0.1%.

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### 7.5 Test methods for industrial contaminants

Testing of fish oil samples for PCBs and dioxin-like PCBs shall be performed utilizing a slightly modified high resolution gas chromatography-high resolution mass spectrometry (HRGC-HRMS) method, EPA Method 1668, Revision A: Chlorinated Biphenyl Congeners in Water, Soil Sediment and Tissue by HRGC-HRMS. Testing of fish oil samples for dioxins and furans shall be performed utilizing a slightly modified high resolution gas chromatography-high resolution mass spectrometry (HRGC-HRMS) method, EPA Method 1613, Revision B: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC-HRMS.

Manufacturers shall meet this testing requirement by one of the following routes;

- through the use of compliant ingredients as demonstrated by third party testing;
- performing testing utilizing a laboratory accredited for PCBs, Dioxin and Furans under ISO 17025 and providing the sample results, data, and quality control results, for review to support compliance; or
- having testing performed by an accredited testing laboratory.

Testing for diethylene glycol in finished products containing glycerin shall be performed utilizing liquid chromatography mass spectrometry (LC-MS) methodology, which has been shown to be valid for the particular sample matrix being tested. Alternately, the glycerin raw material itself may be tested utilizing gas chromatography as described in the glycerin monograph USP 31-NF 26.

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<sup>1</sup> Council for Responsible Nutrition, Omega 3 Fatty Acids Voluntary Monograph, March 2006. Dioxin limits include the sum of polychlorinated dibenzo-*para*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) and are expressed in World Health Organization (WHO) toxic equivalents using WHO-toxic equivalent factors (TEFs). This means that analytical results relating to 17 individual dioxin congeners of toxicological concern are expressed in a single quantifiable unit: TCDD toxic equivalent concentration or TEQ.