

# I A F M M

# FISH OIL BULLETIN

international association of fish meal manufacturers

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## RECOMMENDED METHOD OF ANALYSIS FOR DETERMINATION OF COLOUR IN FISH OIL

### A. GARDNER METHOD

#### 1. Principle

The colour of fish oil is determined by comparison with that of a range of consecutively numbered standards of specified colour. These are the Gardner standards.

#### 2. Apparatus

Eighteen glass standards, numbered separately and exhibiting the transmittance characteristics shown in the following table:

#### CHROMATICITY CO-ORDINATES OF GARDNER REFERENCE STANDARDS

Standard number	Chromaticity co-ordinates	
	Y	X
1	0.3177	0.3303
2	0.3233	0.3352
3	0.3329	0.3452
4	0.3437	0.3644

Standard number	Chromaticity co-ordinates	
	Y	X
5	0.3558	0.3840
6	0.3767	0.4061
7	0.4044	0.4352
8	0.4207	0.4498
9	0.4343	0.4640
10	0.4503	0.4760
11	0.4842	0.4318
12	0.5077	0.4638
13	0.5392	0.4458
14	0.5646	0.4270
15	0.5857	0.4089
16	0.6047	0.3921
17	0.6290	0.3701
18	0.6477	0.3521

The values of the chromaticity co-ordinates may be obtained spectrophotometrically (according to ASTM D307) or by visual comparison with authentic standards. The individual standards should not depart from the above co-ordinates by more than one-third of the distance to the next colour. In any one set, no two standards should be closer than two-thirds of the nominal value of the colour difference between them.

Clear glass tubes measuring  $10.65 \pm 0.025$  mm internal diameter and approximately 114 mm in length.

A suitable apparatus allowing a convenient comparison between sample and preferably all standards (one sample flanked by two standards) to be held in a vertical position in front of an illuminated white background. The tube and standards should not be allowed to touch along their length but should be sufficiently close to enable the sample to be readily compared with its immediate neighbours.

### 3. Method

The sample is firstly centrifuged at ambient temperature to remove suspended material leaving clear oil and transferred to the assay tube.

The colour comparison is carried out in such a way that the sample is positioned between consecutively numbered standards.

### 4. Result

The colour of the sample is reported as the number of the standard most closely matching the sample. If the sample falls between two standards it is reported as "+" or "-" depending on whether it is darker or lighter than the standard it most closely resembles.

## B. LOVIBOND METHOD

### 1. Principle

This method determines the colour in fish oil by use of the Lovibond Tintometer. Applicable to fish oil providing no turbidity is present in the sample.

### 2. Apparatus

AF 700 Lovibond Tintometer complete with light cabinet and with a range of red, yellow and blue glass filters.

Glass Cells with optical path length 10mm and 50mm.

Filter paper (medium porosity).

### 3. Method and Calculation

The sample must be absolutely clear; if not filter through the specified paper.

Before use follow the general directions in the Tintometer leaflet.

Fill a 50mm glass cell with sample and place in the Tintometer cabinet. Set the yellow colour on 35 and match the colour of the oil with the permanent red glass standards.

Report the colour as red unit/35 yellow in 50mm glass cell.

If the colour of the oil exceeds 40.0 red unit, use 10mm glass cells and multiply the reading by 5.

For off standard oils it is sometimes necessary to dilute with toluene to obtain readings. In these cases multiply with the dilution factor.