

Certificate of Analysis

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|-------------------|-----------------|
| Product | CASTOR OIL, USP |
| LOT # | COUSP/08/20 |
| Shelf Life | 3 years |

| Properties | Specifications | Results |
|------------------------|--|----------|
| Free Fatty Acid | 1.5 Max | 0.325 |
| Saponification Value | 176 – 185 | 176.80 |
| Hydroxyl Value | 160 – 168 | 161.22 |
| Iodine Value | 82 – 90 | 82.39 |
| Specific Gravity @30°C | | 0.9730 |
| Heavy metals | 0.001 Max | 0.0 |
| Distinction | Partly soluble in solvent hexane. Yields a clear liquid with an equal volume of alcohol. | Comforms |

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Certificate of Analysis

| | |
|-------------------|-----------------|
| Product | CASTOR OIL, USP |
| LOT # | 1136116 |
| Shelf Life | 2 years |

| Properties | Specifications | Results |
|-----------------------|----------------|---------|
| Flavor/Aroma | Typical | Typical |
| Hydroxyl Value | 160 – 168 | 161.130 |
| Specific Gravity | 0.957 – 0.961 | 0.958 |
| Acid Value | 0.0 – 2.0 | 0.76 |
| Unsaponifiable Matter | 0.0 – 0.80 | 0.3800 |
| Peroxide Value | 0 – 10 | 2.04 |
| Palmitic Acid | 0.0 – 2.0 | 1.30 |
| Stearic Acid | 0.0 – 2.5 | 1.29 |
| Oleic Acid | 2.5 – 6.0 | 4.56 |
| Linoleic Acid | 2.5 – 7.0 | 4.63 |
| Linolenic Acid | 0.0 – 1.0 | 0.51 |
| Eicosenic Acid | 0 – 1 | 0.18 |
| Ricinoleic Acid | 85 – 92 | 87.03 |
| Moisture Content | 0 – 0.3 | 0.190 |
| UV Absortion | 0.7 – 1.5 | 1.12 |

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Certificate of Analysis

| | |
|-------------------|-----------------|
| Product | CASTOR OIL, USP |
| LOT # | 10729 |
| Shelf Life | 3 years |

| Properties | Specifications | Results |
|------------------------|--|----------|
| Free Fatty Acid | 1.5 Max | 0.26 |
| Saponification Value | 176 – 185 | 180.29 |
| Hydroxyl Value | 160 – 168 | 167.71 |
| Iodine Value | 82 – 90 | 85.30 |
| Specific Gravity @30°C | | 0.9590 |
| Heavy metals | 0.001 Max | 0.0 |
| Distinction | Partly soluble in solvent hexane. Yields a clear liquid with an equal volume of alcohol. | Comforms |

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Certificate of Analysis

| | |
|-------------------|-----------------|
| Product | CASTOR OIL, USP |
| LOT # | PH/38/E/20 |
| Shelf Life | 2 years |

| Properties | Specifications | Results |
|---|---|----------|
| Distinction from most other fixed oils | It is only slightly soluble in solvent hexane, Yields a clear liquid with an equal volume of alcohol. | Pass |
| Identification, UV absorption | 0.7 – 1.5 | 1.14 |
| Fats and fixed oils (AV) | NMT 2.0 | 0.68 |
| Hydroxyl Value | 160 – 168 | 161.42 |
| Peroxide value | NMT 10.0 | 2.15 |
| Unsaponifiable matter | NMT 0.8 | 0.39 |
| Water | NMT 0.3 | 0.21 |
| Specific Gravity @25°C | 0.957 – 0.961 | 0.958 |
| Triglyceride Composition | | |
| RRR | ≥ 90 | Conforms |
| RRL | 2.0 - 4.0 | Conforms |
| RRO | 2.5 - 5.0 | Conforms |
| RRS | 0.2 - 0.8 | Conforms |
| Fatty Acid Composition | | |
| Palmitic Acid (C16:0) | < 2.0 | 1.28 |
| Stearic Acid (C18:0) | < 2.5 | 1.34 |
| Oleic Acid (C18:1) | 2.5 - 6.0 | 4.43 |
| Linoleic Acid (C18:2) | 2.5 – 7.0 | 4.64 |
| Linolenic Acid (C18:3) | < 1.0 | 0.48 |
| Cis-11-Eicosenoic Acid (C20:1) | < 1.0 | 0.16 |
| Ricinoleic Acid | 85 – 92 | 87.14 |
| Cis-11-Octadecenoic acid or other unidentified fatty acid | < 1.0 | 0.53 |

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| | |
|-------------------|-----------------|
| Product | CASTOR OIL, USP |
| LOT # | PH/13/C/20 |
| Shelf Life | 2 years |

| Properties | Specifications | Results |
|---|----------------|---|
| Acid value | ≤ 2.0 | 0.86 |
| Unsaponifiable matter | ≤ 0.8 | 0.36 |
| Peroxide value | ≤ 10 | 1.71 |
| Water By KF | ≤ 3 | 0.14 |
| Ultraviolet Absorbance (Specific Absorption) | 0.7 – 1.5 | 268 nm=1.325 269 nm =1.336 270nm =1.313 |
| Fatty Acid Composition | | |
| Palmitic Acid (C16:0) | ≤ 2 | 1.05 |
| Stearic Acid (C18:0) | ≤ 2.5 | 1.26 |
| Oleic Acid (C18:1) | 2.5 – 6.0 | 3.42 |
| Linoleic Acid (C18:2) | 2.5 – 7.0 | 4.38 |
| Linolenic Acid (C18:3) | ≤10 | 0.54 |
| Cis-11-Eicosenoic Acid (C20:1) | ≤1.0 | 0.26 |
| Ricinoleic Acid | 85 – 92 | 88.46 |
| Others | ≤1.0 | 0.63 |

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Certificate of Analysis

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|-------------------|-----------------|
| Product | CASTOR OIL, USP |
| Lot # | 1121109 |
| Shelf Life | 2 years |

| Properties | Specifications | Results |
|-------------------------|----------------|----------|
| Flavor/Aroma | Typical | Complies |
| Acid Value MG KOH/G | 0 – 2 | 0.88 |
| Unsaponifiable matter | 0.0 – 0.80 | 0 |
| Peroxide Value (MEQ/KG) | 0 - 10 | 2.40 |
| Palmitic Acid C 16:0 | 0.0 – 2.0 | 1.22 |
| Stearic Acid C18:0 | 0.0 – 2.5 | 1.48 |
| Oleic Acid C18:1 | 2.5 – 6.0 | 4.65 |
| Linoleic Acid C18:2 | 2.5 – 7.0 | 5.32 |
| Linolenic Acid C18:3 | 0.0 – 1.0 | 0.57 |
| Eicosenoic Acid C20:1 | 0 - 1 | 0.30 |
| Ricinoleic Acid | 85 - 92 | 87.18 |
| Moisture Content | 0 – 0.3 | 0.110 |
| Uv Absorption | 0.7 – 1.5 | 1.126 |

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