

**MIL-C-15179B(OS)**  
 18 January 1971

**SUPERSEDING**  
 MIL-C-15179A  
 15 January 1952

**MILITARY SPECIFICATION**

**CASTOR OIL, DEHYDRATED**

This specification has been approved by the Naval Ordnance Systems Command, Department of the Navy.

**1. SCOPE**

1.1. This specification covers a dehydrated castor oil for paints, varnishes, lubrication, and specialized applications.

**2. APPLICABLE DOCUMENTS**

2.1. The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

**SPECIFICATIONS**

**Federal**

**TT-P-143**                      **Paint, Varnish, Lacquer, and Related Materials;  
 Packaging, Packing and Marking of**

**STANDARDS**

**Federal**

**Fed. Test Method**                      **Paint, Varnish, Lacquer, and Related Materials;**  
**Std. No. 141**                              **Methods of Inspection, Sampling and Testing**

**Military**

**MIL-STD-105**                      **Sampling Procedures and Tables for Inspection  
 by Attributes**

(When requesting any of the applicable documents refer to both title and number. All requests should be made via the cognizant Government quality control representative. Copies of this specification and other unclassified specifications

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and drawings required by contractors in connection with specific procurement functions should be obtained upon application to the Commanding Officer, Naval Publications and Forms Center (Code 1051), 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120. All other documents should be obtained from the procuring activity or as directed by the contracting officer.)

### 3. REQUIREMENTS

3.1 Materials - The dehydrated castor oil shall be produced by dehydration of castor oil and polymerization thereof, and shall contain no admixture of other oils. The material shall be clear and free from suspended matter.

3.1.1 Odor - The dehydrated castor oil shall have a mild and normal odor.

3.2 Physical properties - When tested as specified in Section 4, the physical properties of the dehydrated castor oil shall conform to the requirements specified in Table I.

TABLE I

PHYSICAL PROPERTIES

PROPERTY	REQUIREMENTS	
	MINIMUM	MAXIMUM
Viscosity, Stokes, at 25°C	6.27	12.9
Specific gravity, at 60°F/60°F	0.942	0.950
Refractive index, at 25°C	1.485	1.488
Saponification No.	189	197
Acid No.	---	8.0
Iodine No. (Wijs)	115	---
Color, Gardner	---	10
Ash, percent	---	0.03
Acetyl value	---	17
Heating test, minutes	---	100
Water, percent	---	0.1

3.3 Workmanship - The castor oil shall be clear and free from suspended matter, or any other adulterant or defects which could cause the material to be unsuitable for the purpose intended.

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#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of tests - All the tests required for the testing of castor oil are classified as quality conformance tests.

4.3 Test conditions - The laboratory testing conditions shall be in accordance with Fed. Test Method Std. No. 141 and as described herein.

4.4 Examination of product - The castor oil shall be examined for conformance with the requirements of this specification with respect to material and workmanship.

#### 4.5 Sampling -

4.5.1 Inspection lot - An inspection lot size shall consist of the castor oil manufactured from one batch or tank, under essentially the same conditions and presented for acceptance at one time. The lot size shall not exceed 1,000 gallons.

4.5.2 Sampling for tests - Samples of castor oil shall be selected as required by Fed. Test Method Std. No. 141, Method 1021.

4.5.3 Sampling for examination of filled containers - A random sample of filled containers shall be selected in accordance with MIL-STD-105 at Inspection Level I and Acceptable Quality Level of 2.5 percent defective to verify all requirements of this specification in regard to fill, closure, evidence of leakage, packaging, packing, marking, workmanship, and other requirements not involving tests. The sample unit for this examination shall be one container.

4.6 Test methods - The tests of this specification shall be conducted in accordance with the specified methods of Fed. Test Method Std. No. 141 and as described herein.

4.6.1 The following tests shall be made in accordance with the applicable methods specified in Table II.

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TABLE II  
TEST METHODS

TESTS	REQUIREMENT PARAGRAPH	TEST METHODS
Viscosity, at 25°C	3.2	4271
Specific gravity, at 60°F/60°F	3.2	4183
Refractive index, at 25°C	3.2	4371
Saponification No.	3.2	5081
Acid No.	3.2	5071
Iodine No. (Wijs)	3.2	5061
Color, Gardner	3.2	4248
Ash	3.2	5265
Acetyl value	3.2	(See 4.6.2)
Heating test, minutes	3.2	4441
Water	3.2	4081

4.6.2 Acetyl value - Reflux approximately 30ml. of oil with an equal volume of acetic anhydride for two (2) hours in an Erlenmeyer flask fitted with a ground-in air condenser, consisting of a straight glass tube approximately two (2) feet in height and 10 mm. in diameter. At the end of the 2-hour refluxing period, pour the mixture into 500 ml. of boiling distilled water contained in a liter beaker.

NOTE: Pass a slow stream of carbon dioxide gas through the boiling liquid, or add pieces of pumice, carborundum brick, or other inert material to prevent bumping at this stage.

Continue boiling vigorously for 30 minutes. Allow to cool slightly and siphon off the water layer. Boil the oily layer with similar successive fresh portions of distilled water until the wash water is neutral to litmus paper. Three boilings are generally sufficient. When washed free from acid, transfer the still warm acetylated oil to a centrifuge tube and centrifuge to remove any remaining water. After centrifuging, carefully remove two samples of the clear acetylated oil of approximately 2.5 gm. each. Be careful to remove the acetylated oil only, without contamination by water. Transfer each sample to a clean tared 300 ml. Erlenmeyer flask. Accurately weigh each Erlenmeyer flask and its contents. Determine the exact weight of each sample. Determine the saponification number of each acetylated oil sample in accordance with Method 5081 of Fed. Test Method Std. No. 141.

Calculate the acetyl value as follows:

$$A = \frac{S' - S}{1 - 0.00075S}$$

Where: A = Acetyl value, mg KOH per gram  
 S = Saponification number of the oil, mg KOH per gram  
 S' = Saponification number of the acetylated oil, mg KOH per gram

4.7 Inspection for packaging, packing and marking - The castor oil shall be inspected for all the requirements of Section 5.

4.8 Rejection criteria - When any lot acceptance test sample fails to meet any of the test requirements of this specification or when the number of defective filled containers exceeds the acceptance number as specified in 4.5.3, the lot represented by the sample shall be rejected.

## 5. PREPARATION FOR DELIVERY

5.1 Levels of packaging - The level of packaging shall be Level A or C, as specified. (See 6.2)

5.1.1 Level A - The castor oil shall be packaged in accordance with the requirements of TT-P-143.

5.1.2 Level C - When Level C is required, packaging shall conform to the manufacturer's commercial practice, unless the procuring activity determines that modification to the manufacturing commercial practice is required to meet the requirements of this level.

5.2 Levels of packing - Packing shall be Level A, B, or C, as specified. (See 6.2)

5.2.1 Level A - The castor oil packaged as specified in 5.1, shall be packed in accordance with the requirements of TT-P-143, Level A.

5.2.2 Level B - The castor oil packaged as specified in 5.1, shall be packed in accordance with the requirements of TT-P-143, Level B.

5.2.3 Level C - The packaged castor oil which requires packing for acceptance by the carrier, shall be packed in accordance with good commercial practices so as to ensure safe transportation at the lowest rate to the point of delivery.

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5.3 Marking - Individual drums, cans and shipping containers, as applicable, shall be marked in accordance with TT-P-143, by stenciling or some other permanent process. Paper labels are not acceptable. The drums, cans and shipping containers, as applicable, shall be marked with the following information:

Name of material  
Stock Number  
Specification number MIL-C-15179B(OS)  
Name of manufacturer  
Manufacturer's batch number, date of manufacture (month and year), or other symbol indicating time and place of processing  
Government contract or order number  
Quantity contained therein as defined by the contract or order under which the shipment is made

6. NOTES

6.1 Intended use - The castor oil is intended for use in the manufacture of paints and varnishes and lubrication of O-rings and other items and components where a medium viscosity dehydrated castor oil is required.

6.2 Ordering data - Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Quantity required and size of containers in which the castor oil is to be furnished.
- (c) Selection of applicable levels of packaging and packing (see 5.1 and 5.2)

6.3 Supersession data - This specification supersedes WS 8693.

Preparing activity:  
Navy-OS  
(Project No. 8010-N008)