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Fed. Std. No. 148a

December 10, 1964

Change Notice 1

September 14, 1965

FEDERAL STANDARD
CLASSIFICATION, IDENTIFICATION, AND TEST-
ING OF FEATHER FILLING MATERIAL

The following changes in Fed. Standard No. 148a, dated December 10, 1964, have been approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. Revised method. The following revised method is a part of this standard:

Index of Test Methods

**Method No. 10.1 Determination of
Turbidity (Turbidimeter Method)**

**RETAIN THIS COVER PAGE AND INSERT BEFORE THE TABLE
OF CONTENTS OF THIS STANDARD**

FED. STD. NO. 148a

METHOD 10.1

September 14, 1965

**DETERMINATION OF TURBIDITY
(TURBIDIMETER METHOD)****1. SCOPE**

1.1 This method is intended for determining the turbidity, as a measure of cleanness, of feather filling materials by means of a turbidimeter.

2. TEST SPECIMEN

2.1 The specimen shall consist of 10.0 ± 0.1 grams of material.

3. NUMBER OF DETERMINATIONS

3.1 Unless otherwise specified in the material specification, two specimens shall be tested from each sample unit.

4. APPARATUS

4.1 Tumbler jar. The tumbler jar and apparatus shall be as specified in method 5500 of Fed. Spec. CCC-T-191 except that the jar shall be all glass or stainless steel.

4.2 Jackson turbidimeter.

4.2.1 *Glass tube.* The graduated glass tube, calibrated in centimeters from the bottom of the inside of the tube, is enclosed in a metal support. The tube shall conform to the requirements for Nessler tubes; i.e., it shall be of the "tall" form, made of resistant glass and selected from uniformly drawn tubing. The glass shall be clear and colorless. The tube shall have a bottom that is plane-parallel. When the tube is filled with liquid and viewed from the top, using a light source beneath the tube, there shall be no dark spots nor any lens-like distortion of

the transmitted light. The relationship between Jackson candle turbidity and centimeters is shown in table I.

TABLE I
Graduation of the candle turbidimeter

Light path (distance from inside bottom of glass tube)	Turbidity units	Light path (distance from inside bottom of glass tube)	Turbidity units
<i>cm.</i>		<i>cm.</i>	
2.3	1,000	11.4	190
2.6	900	12.0	180
2.9	800	12.7	170
3.2	700	13.5	160
3.5	650	14.4	150
3.8	600	15.4	140
4.1	550	16.6	130
4.5	500	18.0	120
4.9	450	19.6	110
5.5	400	21.5	100
5.6	390	22.6	95
5.8	380	23.8	90
5.9	370	25.1	85
6.1	360	26.5	80
6.3	350	28.1	75
6.4	340	29.8	70
6.6	330	31.8	65
6.8	320	34.1	60
7.0	310	36.7	55
7.3	300	39.8	50
7.5	290	43.5	45
7.8	280	48.1	40
8.1	270	54.0	35
8.4	260	61.8	30
8.7	250	72.9	25
9.1	240		
9.5	230		
9.9	220		
10.3	210		
10.8	200		

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4.2.2 Candle. A candle of appropriate length made of beeswax and spermaceti, which burns at a rate of 114 to 125 grains per hour.

4.2.3 Support. A support which aligns the candle and the glass tube in a vertical position so that the center line of the tube passes through the center line of the candle. The candle support shall consist of a spring loaded cylinder designed to keep the top of the candle pressed against the top of the support as the candle burns away. The top of the support for the candle shall be 3 inches below the bottom of the tube.

4.3 Analytical balance.

4.4 Beaker, 2000 milliliters.

4.5 Sieve, 74 micron (Standard No. 200) conforming to Fed. Spec. RR-S-366, Sieves, Standard for Testing Purposes.

4.6 Distilled water.

5. PROCEDURE

5.1 Place 10.0 ± 0.1 grams of feather filling material in a tumble jar with one liter of distilled water and tumble at room temperature for 60 to 65 minutes. The resulting suspension shall be filtered through a sieve into a 2,000-ml. beaker. The stock will be captured by the screen sieve and the wash liquor will pass through into the beaker.

5.2 The applicable procurement document shall state the turbidity value, i.e., the centimeter height required. Based on this value, the appropriate amount of filtrate prepared in 5.1 shall be transferred to the calibrated Nessler tube and the tube filled to the exact level (cm.) required.

5.2.1 The tube shall then be placed in the support and the candle lit. When the candle

flame has reached its full burning height, the flame shall be observed by viewing it through the length of the filled tube. An image of the flame (a bright spot, however distinguishable from the illuminated field), should be seen at this time. If a uniformly illuminated field with no bright spot is seen, the specimen fails.

5.2.2 Care shall be taken to keep the calibrated tube dry on the outside and to avoid scratching of the glass. To insure uniform results, the flame must be kept as near constant size as possible. This will require frequent trimming of the charred portion of the wick and frequent observation to insure that the candle is at the top of its support. All drafts must be eliminated during the measurements to prevent the flame from flickering. The candle shall not be kept burning for more than 2 minutes at a time. Each time the candle is relit, the charred portion of the wick shall be cut off. If difficulty is noted in observing the candle flame, the observation shall be made in subdued light. In addition, a quantity of the suspension shall be removed by pipette and the flame observed while slowly returning the suspension to the tube until the candle flame just disappears. After the image has been made to disappear, the removal of one percent of the sample should again make the flame image visible.

6. REPORT

6.1 The turbidity of the sample unit shall be determined by the test of duplicate aliquots of the specimen filtrate and the result of each aliquot reported as "pass" or "fail". Failure of one aliquot shall be cause for rejection. When a specimen fails, the level (centimeter height), at which the image of the candle flame just disappears shall be reported in accordance with the procedure in 5.2.2.