LUMA	Document Title: **Single Phase Oil Immersed Distribution Transformers (Pole-Type)**		
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Related/Referenced Documents

N/A

Version History

Version	Date	Revision Comments
1	Dec. 30, 2021	Initial Release.
2	Jul. 22, 2022	Modified required maximum dimensions for transformers. General format corrections.
3	Oct. 28, 2022	Modified required maximum dimensions for transformers and modified low volage bushings requirements.
4	Nov. 21, 2022	Modified tap changer requirements. Tank characteristics modified.
5	Feb. 02, 2024	General format modifications, including requirements for standards, cover locks, number of bushings, labels, pole mounting brackets dimensions, and TOC. The photo was changed.
6	Oct. 28, 2024	General format modifications, TOC updated, Sections 3, 4, 8, and 9 modified, and sections order rearranged. Added item codes 012-04932, 012-05236, 012-05426, 012-05608, 012-05780, and 012-06143.

Item Version History

Warehouse Catalog	Item Version	Date
012-04817	11	10/28/2024
012-04833	11	10/28/2024
012-04858	11	10/28/2024
012-04874	11	10/28/2024
012-04890	11	10/28/2024
012-04916	11	10/28/2024
012-04932	4	10/28/2024
012-05111	11	10/28/2024
012-05137	11	10/28/2024
012-05152	11	10/28/2024
012-05178	11	10/28/2024
012-05194	11	10/28/2024
012-05210	11	10/28/2024
012-05236	8	10/28/2024
012-05293	11	10/28/2024
012-05319	11	10/28/2024
012-05335	11	10/28/2024
012-05350	11	10/28/2024
012-05376	11	10/28/2024
012-05400	11	10/28/2024
012-05426	4	10/28/2024
012-05483	11	10/28/2024
012-05509	11	10/28/2024
012-05225	11	10/28/2024
012-05541	11	10/28/2024
012-05566	11	10/28/2024
012-05582	11	10/28/2024
012-05608	4	10/28/2024
012-05665	11	10/28/2024
012-05681	11	10/28/2024
012-05707	11	10/28/2024
012-05723	11	10/28/2024
012-05749	11	10/28/2024
012-05764	11	10/28/2024
012-05780	4	10/28/2024
012-05848	11	10/28/2024
012-05863	11	10/28/2024
012-05889	11	10/28/2024
012-05905	11	10/28/2024
012-05921	11	10/28/2024
012-05947	11	10/28/2024
012-05962	11	10/28/2024
012-06085	11	10/28/2024
012-06101	11	10/28/2024
012-06127	11	10/28/2024
012-06143	4	10/28/2024
012-05905	11	10/28/2024
012-05921	11	10/28/2024

1. Introduction

This is a general specification that covers the minimum requirements for the single-phase pole-type transformers to be used in the distribution system in Puerto Rico. Further information will be provided by LUMA Energy at the time of order placement and will provide information on site specific conditions, quantity, and other requirements. This document includes the general electrical and mechanical characteristics of the equipment/material.

2. Special Requirements

Samples shall be furnished as requested by LUMA Energy. Vendors that have supplied this equipment/material to LUMA on previous orders will not have to furnish samples at bid opening. The equipment/material will be received at the LUMA's general warehouse (011) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.

3. Literature

3.1. Descriptive and technical literature must be supplied by the vendor at time of bidding. This literature must include, but is not limited to details of material, drawings, documented testing, and instructions for use and installation. **The literature must be an official document from and certified by the manufacturer.** Failure to submit documents on time and duly certified by the manufacturer will cause bidder disqualification.

3.2. If required by LUMA, final drawings and documentation shall be submitted by the vendor before the manufacturing and shipping process for approval.

4. Compatible with

4.1. ABB, MEGA-TRAN, Cooper Power Systems.

4.2. These models are examples of the equipment/material described in this document and do not represent a preference. LUMA will evaluate equally any model not listed here during any acquisition event.

5. Markings

5.1. Containers shall be marked outside with LUMA Energy purchase order and item number.

5.2. Transformers shall be marked on the cover with the point of delivery (district) and purchase order number using a label.

5.3. Packaging labels and tags shall be waterproof.

6. Packaging

6.1. All equipment/material shall be packaged and marked in such a way as to facilitate handling and protection from damage and that the receiving warehouse can readily identify it and send it, in one complete unit, to a field location without opening crates or boxes to sort items and/or parts.

6.2. Each unit shall be banded to a two-way entry, disposable pallet of the manufacturer's own design. The pallet shall be of such dimensions as to provide a minimum of one inch (1") clearance at the transformers widest outside measurements, on all four sides. It shall provide a minimum of two and a half inches (2-1/2") of fork under clearance.

6.3. The transformer shall be banded to the pallet, using non-metallic banding, to prevent rust and shifting of the unit during transit, while allowing the unit to be handed by sling or fork truck without removing the banding.

6.4. LUMA shall allow the use of metallic banding ONLY if such banding is protected in the places in which the band is in direct contact with the transformer tank.

6.5. The banding method to be used shall be submitted by the awarded bidder for LUMA's approval.

7. Number Per Package (Logistics)

One (1) unit per package or as required by LUMA Energy.

8. Acceptance Criteria

8.1. Product shall be manufactured in accordance with the latest issue below (section 8.2). When conflicts occur between purchaser's specifications and the latest issue below, the purchaser's specification shall prevail.

8.2. All characteristics, definitions, and terminology, except as specifically covered in this specification, shall be in accordance with the latest revision of the following ANSI standards:

a. C57.12.00: General requirements for liquid- immersed distribution, power, and regulating transformers.

b. C57.12.20: Overhead-type distribution transformers 500 kVA and smaller; high voltage, 34.500 kV and below; low voltage, 7.97/13.8 kV Y and below.

c. C57.12.30: Pole-Mounted Equipment Enclosure Integrity for coastal environments.

d. C57.12.90: Test code for liquid-immersed distribution, power, and regulating transformers and guide for short-circuit testing of distribution and power transformers.

e. C57.91: Guide for loading mineral-oil-immersed transformers with insulating system rated for 65°C or 55°C average winding temperature rise at rated load.

f. C57.125: Guide for failure investigation, documentation, analysis, and reporting for power transformers and shunt reactors.

8.3. Also, it shall comply, but shall not be limited to, with the latest revision of applicable codes, standards, and other regulations.

8.4. If any other standard different from the ones indicated in this document are used, the supplier must provide information showing compatibility with the required ones.

8.5. The routine and design tests shall be as per ANSI C57.12.00. The routine test samples performed on the units shall be submitted at the bid opening. The design test samples will be submitted only when the supplier requires approval of the equipment. The bidder shall submit a written certification stating that all tests shall be performed according to the latest codes, standards, and regulations to provide a product of quality.

8.6. The following routine tests shall be performed on each unit:

a. Voltage ratio

b. Polarity

c. Phase relationship

d. Core losses (no-load losses)

e. Exciting current

f. Winding losses (load losses)

g. Tank leaks

h. Impedance

i. Applied potential

j. Induced potential

k. Impulse tests

8.7. Typical design tests data shall include the following:

a. Insulation resistance

b. Power factor

c. Temperature rise

d. Over excitation

e. Radio interference

f. Oil tests

g. Noise tests as per NEMA Standard TR 1, latest revision.

h. Tank pressure withstand.

8.8. The temperature at which the tests were performed shall be included in the document.

8.9. Parameters of resistance (%R), reactance (%X), and impedance (%Z) for each transformer shall be included in the document.

8.10. The tests mentioned at 8.5. shall be performed on the fully assembled unit at manufacturer's location. **TESTS SHALL BE PERFORMED IN THE UNITS WITH ALL ITS ACCESSORIES AND/OR PARTS INSTALLED**.

8.11. Any exceptions to the tests mentioned in 8.5. shall be specified at bid opening.

9. Description

9.1. Distribution transformers, 60 Hz, pole type, single phase, 65°C average winding rise, oil immerse, used to provide the final voltage transformation in the electric power distribution system, stepping down the voltage used in the distribution lines to the level used by the customer in their home, businesses, and commercial buildings.

9.2. The transformer shall consist of tank, core, bushings, insulating oil, tap changer, etc.

9.3. Transformers shall be supplied with a high-power factor and low core and winding losses.

9.4. Painting

a. Tank and covers shall be protected against environmental conditions and corrosion by means of an adequate process of painting. Tank and cover shall be painted conform to light gray ANSI number 70, according to ANSI C57.12.30.

b. The paint shall have a great retention of brightness and color in surfaces like aluminum and ferrous and non-ferrous materials. It shall be resistant, during long term, to ultraviolet rays, humidity, corrosion due to acids, salts, organic solvents, gases, and others. It shall comply with federal regulations on temperature and environment.

c. Paint shall be suitable for tropical climate conditions as per ANSI C57.12.30.

d. To be evaluated, technical and descriptive literature shall be supplied at the bid opening. This literature shall include, but shall not be limited to, the process, type of paint and description, material safety data sheet, etc.

9.5. Nameplate

a. Shall be mounted on one of the mounting brackets in such a manner that there are no sharp edges exposed. The material (aluminum or copper) used in each winding, date of manufacture, total weight, serial number, non-PCB compliance, among all the other information as per ANSI C57.12.00 (Nameplate A), shall be shown on the nameplate.

b. The information on the nameplate shall be engraved or stamped. Any of the two processes shall ensure legibility for the life of the transformer.

c. Nameplate shall be made of stainless steel or aluminum.

d. A sample of the nameplate as requested in this section shall be submitted by the awarded bidder.

9.6. Welding

a. Welds to be used shall be in accordance with the material that will be welded and as per American Welding Society (AWS) 1.1 or latest revision.

b. All welds at the exterior of the tank shall be continuous. It shall include the welding, **ON ALL SIDES**, of lifting lugs, mounting brackets, grounding provisions, etc. to prevent accumulation of humidity.

9.7. Core and Winding

a. Cores:

1. Shall be made from high quality grain-oriented silicon steel with flat, rolled, and low loss permeability laminations.

2. Core shall be made free of buckles and wave surface defects.

b. Winding:

1. Shall be non-telescoping with high and lower tension windings assembly forming and integral unit.

2. The winding polarization index shall be 2.0 or more as per ANSI C57.125-2015.

9.8. Transformer losses and bidding procedure

a. The bidder shall submit the no load losses at 20°C, load losses at 85°C full load and load losses at 55°C at 50% of load to calculate the efficiency and life cycle cost.

b. The bidder shall specify the winding material of the primary and secondary at the bid opening.

c. All losses information will be used to evaluate the life cycle cost (LCC) of each bidder according to the following formula,

LCC = (UC) + ($8.95) * NLL + ($4.73) * LL, where

UC = unit cost ($)

NLL = No load losses (W) at 20°C

LL = Load losses (W) at 85°C full load

d. Shall comply with Part II of the Department of Energy (DOE 2016) 10 CFR PART 431 minimum requirements.

1. The efficiency shall be no less than that required for their kVA rating in the table below defined at 50% of load with no load losses at 20°C and load losses at 55°C.

Energy Conservation Standards for 1Ø Liquid-Immersed Distribution Transformers	
kVA	**Efficiency (%)**
15	98.82
25	98.95
37.5	99.05
50	99.11
75	99.19
100	99.25
167	99.33
250	99.39
333	99.43
500	99.49

9.9. Tap Changer

a. Shall be of the no load rotating type with an externally operated handle designed for de-energized operation.

b. Shall be located under oil level with five (5) taps, including nominal voltage, each of two and a half percent (2.5%) of rated primary voltage.

c. The tap range shall be two taps above (+2) and two taps below (-2) of the rated primary voltage.

d. The tap changer shall have stops at each position to set the desired voltage.

e. A label shall be placed below the tap changer indicating that the transformer must be de-energized prior to the operation of the tap changer. A sample of this label shall be submitted if requested by LUMA.

f. The tap changer shall be fixed in a place not exposed to possible damage due to the handling of the transformer.

g. The tap changer shall be compatible with:

1. Central Moloney Part Number 70-333-153 or,

2. RTE tap changer with level handle and index plate or,

3. RTE tap changer with cap/wrench and terminal posts.

9.10. Insulating Oil

a. Each transformer shall be furnished with its tank filled with oil with a polychlorinated biphenyl (PCB) concentration of less than 1 PPM (NO PCB). The nameplate shall indicate this compliance. A label indicating NO PCB shall be affixed to the transformer in a visible place. The label shall have the same duration as the transformer under normal operating conditions.

b. The insulating oil shall comply with ANSI/ASTM D3487 and LUMA requirements.

The oil shall have, in addition, the following:

1. 30 kV minimum breakdown voltage
2. Neutralization number of 0.25.
3. Viscosity of:
    a. 81.25 centistokes at 25°C as per ASTM D445-86.
    b. 15.00 centistokes at 100°C as per ASTM D445-86.

c. The awarded bidder shall submit:

1. A certificate stating that, at all moments, the transformers supplied to LUMA shall have a concentration of less than 1 PPM of PCB.
2. Safety Data Sheet (SDS) of the oil.

9.11. Pressure Relief Valve

a. The body of the pressure relief valve shall be an internal fault detector type compatible with IFD Corporation and in accordance with ANSI C57.12.20.

b. The relief valve shall allow the pressure inside the tank to be released but no air is admitted when the unit is cool or lightly loaded.

c. Venting on rising pressure shall occur between eight (8) and twelve (12) psi. Resealing on falling pressure shall occur between five (5) and eight (8) psi.

9.12. Insulation

a. Shall be made with, at least, Class A (105°C) insulation system as per ANSI C57.12.80.

b. The insulation power factor shall be as per ANSI C57.12.90.

c. Technical information about the insulation shall be submitted by the awarded supplier.

9.13. Additional Labels

a. The labels shall have a margin of approximately 1/2" on each side.

b. Each number and letter shall have a width between 0.75” and 1”. The height shall be 2”.

c. The transformer shall have the following labels made as per section 9.14 below:

1. kVA Rating:

   This label shall be placed, whenever possible, below the secondary voltage bushings. Dimensions as per section 9.14.d.

2. STAINLESS STEEL:

   This label shall be placed directly under the kVA rating label. Dimensions as per section 9.14.d.

3. LUMA's Property Number

   This label shall be placed in a visible place. The supplier must ask for the sequence of property numbers to the LUMA’s Distribution Material Section before shipment. The transformers shall get to LUMA with those labels affixed to them. See Appendix 1 for label details.

d. The following table summarizes the dimensions of the required labels:

SECTION	LABEL DESCRIPTION	WIDTH (IN.)		HEIGHT (IN.)	
		MIN.	MAX.	MIN.	MAX.
9.9.e.	TAP CHANGER	INDUSTRY STANDARD			
9.10.a.	NO-PCB				
9.13.c.1	kVA RATING	7	8	3	4
9.13.c.2.	STAINLESS STEEL	12	13	3	
9.13.c.3.	WAREHOUSE AND PROPERTY NUMBERS	12 (aprox.)		4 (aprox.)	
FOR DETAILS ON THIS LABEL REFERS TO THE MENTIONED SECTIONS.					

9.14. Thermal transfer polyester label shall have the following characteristics:

a. Substrate specifications:

1. Material: Polyester
2. Shall resists abrasion, acids, chemicals, corrosives, solvent, moisture, and humidity, cold, and tearing.
3. Temperature range: 0°C to 50°C (32°F to 122°F)

b. Adhesive specifications:

1. Adhesive type shall be acrylic.
2. Shall be compatible with dirt, high-energy and low-energy plastics, painted metal, polyethylene, metals and untreated metals, and irregular surfaces.
3. Color: The numbers will be black over a white base to assure legibility from about 35 ft.

c. The label shall last a minimum of 20 years when installed on the transformer under normal operating conditions.

9.15. kVA Rating

a. The transformer shall be designed in accordance with this specification and shall have one of the following kVA ratings:

kVA RATINGS						
15	**25**	**37.5**	**50**	**75**	**100**	**167**

9.16. Voltages Ratings and Basic Insulation Level (BIL)

a. The primary voltage, secondary voltage, and the basic insulation level (BIL) shall be as per the following table:

PRIMARY VOLTAGE (V)	BIL (kV)
2400/4160 Y	60
2400/4160 Y * 4800/8320 Y	60 * 75
4160/7200 Y	75
4800/8320 Y	75
7200/12470 Y	95
7620/13200 Y	95
8320/14400Y	95
13200/22860 Y	125
SECONDARY VOLTAGE	**BIL (kV)**
120/240	30

b. Transformers with dual primary voltage shall have an externally operable, de-energized switch to select the desired voltage. The voltage provided and the basic insulation level (BIL) shall be as per the table above. A label shall be placed in each one of the two positions of the switch indicating the primary voltage at each position.

9.17. Tank

a. Stainless-Steel 304 gage 14 for severe corrosion (salt spray) areas.

b. Tank characteristics:

1. Constructed in accordance with the latest revisions of ANSI C57.12.20 and ANSI C57.12.30.

2. Suitable for outdoor use.
3. Cylindrical shape and weatherproof.
4. Suitable for mounting on flat surfaces or poles.
5. Fitted with lifting lugs, mounting brackets, and grounding provisions. All of them welded as indicated in section 9.6 above.
    a. The mounting brackets spacing distance shall be 11.25" for 15 to 50 kVA transformers and 23.25" for 75 to 167 kVA as per ANSI C57.12.20.
6. Coating shall meet all requirements in ANSI C57.12.30.
7. The paint shall be light gray ANSI no. 70, Munsell Notation, 5BG 7.0/0.4.
8. Shall have a recessed tank bottom which offers protection when sliding over rough surfaces.
9. Shall have an internal mark, which indicates the proper oil level per Section 7.2.3 of ANSI C57.12.20.

9.18. Cover

a. Shall be dome type, insulated, and not welded to the tank.
b. Shall be coated with a dielectric finish.
c. Shall be of the bolted clamp, center bolted, or bolted fastening ring type. Bolts, nuts, and washers used, together with the base in which they will be mounted, shall be stainless steel.
d. Shall be made of the same material as the tank.

9.19. Bushings

a. Shall be high and low tension insulated and in accordance with NEMA standards.
b. High and low voltage bushings provided shall be porcelain in accordance with Table 6 of ANSI C57.12.20.
c. Shall be either cover type or sidewall type, according to voltage class as per ANSI C57.12.20.
d. The color of the bushings shall be light gray ANSI no. 70, Munsell Notation 5 BG 7.0/ 0.4.
e. Two (2) bushings shall be required for the high voltage side and three (3) for the low voltage side.

f. High voltage terminals provided shall be mechanical type connectors, tin-plated, to accommodate both aluminum and copper conductors. The size of these terminals shall be in accordance with Table 8 of ANSI C57.12.20.

g. The low voltage terminals provided should be mechanical type connectors, tin-plated, to accommodate both aluminum and copper conductors. The size of the terminals shall be in accordance with Table 9 of ANSI C57.12.20.

9.20. Surge Arrester Mounting Bracket Provision

a. The surge arrester mounting bracket provision will consist of two (2) stainless steel bosses (1/2”-13 TPI stud each) attached to the transformer:

1. For sidewall HV mounted bushings, the top boss shall be mounted 11 inches below the center of the HV bushing and the second one, 2-½ inches below the first one.

2. For cover mounted bushing the top boss will be two (2) inches below the top edge of the tank and the second one, 2-½ inches below the first one.

10. Inspection

The acceptance of any equipment/material shall in no way relieve the vendor from his responsibility to meet all the requirements of this specification, and it would not prevent subsequent rejection if such equipment/materials were found later to be defective.

11. Proposal Information

11.1. Submitted proposals must include:

a. Technical information, tests, and drawings.

b. Table of Compliance completed by the bidder with reference (see Appendix 2).

12. Warehouse and Asset Suite Identification Number

kVA Rating (kVA)	Primary Voltage (kV)	Secondary Voltage (V)	Warehouse Number	Asset Suite Number
15	2.4/4.16	120/240	012-04817	56986
25	2.4/4.16	120/240	012-04833	56988
37.5	2.4/4.16	120/240	012-04858	56990
50	2.4/4.16	120/240	012-04874	59322
75	2.4/4.16	120/240	012-04890	59324
100	2.4/4.16	120/240	012-04916	59326
167	2.4/4.16	120/240	012-04932	59328
15	4.16/7.2	120/240	012-05111	59338

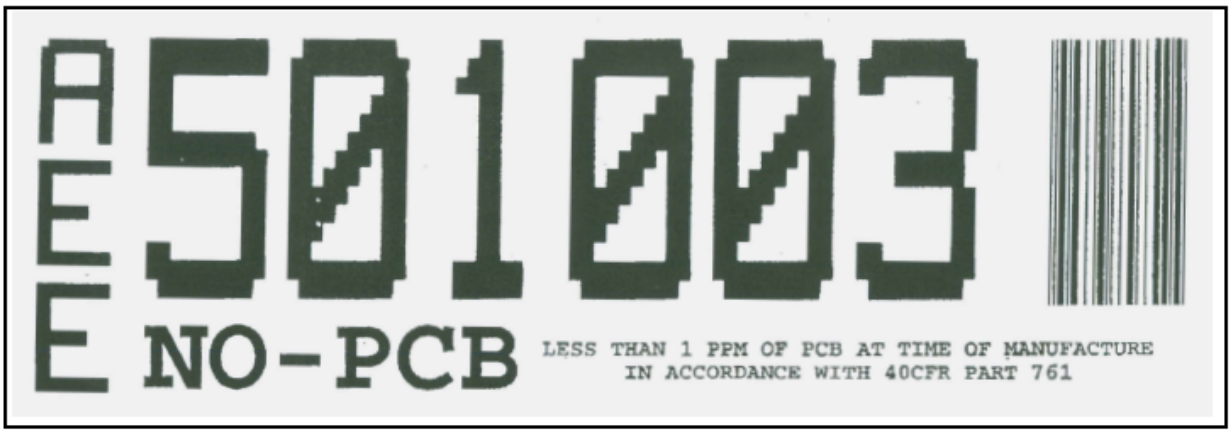
kVA Rating (kVA)	Primary Voltage (kV)	Secondary Voltage (V)	Warehouse Number	Asset Suite Number
25	4.16/7.2	120/240	012-05137	59340
37.5	4.16/7.2	120/240	012-05152	56933
50	4.16/7.2	120/240	012-05178	56935
75	4.16/7.2	120/240	012-05194	56937
100	4.16/7.2	120/240	012-05210	56939
167	4.16/7.2	120/240	012-05236	56942
15	4.8/8.32	120/240	012-05293	56946
25	4.8/8.32	120/240	012-05319	56948
37.5	4.8/8.32	120/240	012-05335	59202
50	4.8/8.32	120/240	012-05350	59204
75	4.8/8.32	120/240	012-05376	59206
100	4.8/8.32	120/240	012-05400	59209
167	4.8/8.32	120/240	012-05426	59211
15	7.2/12.47	120/240	012-05483	59213
25	7.2/12.47	120/240	012-05509	59215
37.5	7.2/12.47	120/240	012-05225	56940
50	7.2/12.47	120/240	012-05541	59218
75	7.2/12.47	120/240	012-05566	59220
100	7.2/12.47	120/240	012-05582	59222
167	7.2/12.47	120/240	012-05608	59224
15	7.62/13.2	120/240	012-05665	59227
25	7.62/13.2	120/240	012-05681	59229
37.5	7.62/13.2	120/240	012-05707	57328
50	7.62/13.2	120/240	012-05723	57330
75	7.62/13.2	120/240	012-05749	57332
100	7.62/13.2	120/240	012-05764	57334
167	7.62/13.2	120/240	012-05780	57336
15	8.32/14.4	120/240	012-05848	57338
25	8.32/14.4	120/240	012-05863	57340
37.5	8.32/14.4	120/240	012-05889	57342
50	8.32/14.4	120/240	012-05905	57344
75	8.32/14.4	120/240	012-05921	58992
100	8.32/14.4	120/240	012-05947	58994
167	8.32/14.4	120/240	012-05962	58996
15	13.2/22.86	120/240	012-06028	58999
25	13.2/22.86	120/240	012-06044	59001
37.5	13.2/22.86	120/240	012-06069	59003
50	13.2/22.86	120/240	012-06085	59005

kVA Rating (kVA)	Primary Voltage (kV)	Secondary Voltage (V)	Warehouse Number	Asset Suite Number
75	13.2/22.86	120/240	012-06101	59007
100	13.2/22.86	120/240	012-06127	58094
167	13.2/22.86	120/240	012-06143	58096

— End of Specification —

Appendix

Appendix 1: LUMA's Property Number Label



This label is an example and is not made to scale. The dimensions shown in the table of section 9.13.d. for this label are approximate. The dimensions could be adjusted to accommodate the actual information.

1. The property numbers shall have a 0.25" thickness, 1.125" width, and 2.125" height.
2. The letters "AEE" shall have a 0.25" thickness, 0.75" width, and 0.075" height.
3. The label shall have 0.5" margins at right, left, top, and bottom.
4. The bar code shall have a 2.125" height.
5. The word "NO-PCB" shall be written below the property number. This word shall begin under the first digit of such number. The letters shall have a 0.125" thickness, 0.5" width, and 0.5" height. This word shall have a separation of 0.125" from the property number. A separation between 0.0625" and 0.125" shall be provided between each letter.
6. The phrase "LESS THAN 1 PPM AT TIME OF MANUFACTURE IN ACCORDANCE WITH 40CFR PART 761" shall be placed as per the drawing. The letters shall have a 0.125" height and the thickness shall be according to their size. This phrase shall be placed in the space remaining between the word "NO-PCB" and the last line of the bar code, beginning at 0.25" from the word "NO-PCB" as shown in the drawing.
7. Label Approximate Final Size: 12" long X 4" high
8. Color: Black numbers over a white base.

Appendix 2: Table of Compliance

Line	Description	Pass/Fail (P / F)	Comments
1	Compliance with the document 4350.016.		
2	Industry standards: ANSI/IEEE C57. (12.00, 12.20, 12.30, 12.90, 91, 125).		
3	Tech. info., drawings, and tests provided.		
4	Pole Type Transformer, Cylindrical Shape		
5	kVA, HV Y - 120/240V, (H & L kVBIL), 60Hz		
6	No load losses at 20°C, load losses at 85°C full load, and load losses at 55°C at 50% of load provided.		
7	DOE 2016 compliance (efficiency as per table in section 9.8).		
8	Stainless Steel (SS) 304, 14-gauge Tank. Construction as per ANSI C57.12.20.		
9	Mounting bracket spacing as per section 9.17.b.5.a.		
10	SS Cover as per section 9.18.		
11	CU or AL Windings		
12	Meet the requirements for the core and windings as stated in section 9.7.		
13	Insulation system: at least, Class A (105°C) as per ANSI C57.12.80.		
14	Tank and cover shall be painted conform to light gray number 70, according to ANSI C57. Shall comply with section 9.4.		
15	SS or AL Nameplate		
16	Nameplate information as per ANSI C57.12.00 (Nameplate A).		
17	All welds at the exterior of the tank shall be continuous to prevent accumulation of humidity.		
18	Five positions Tap Changer (2 taps above and 2 taps below of the rated primary voltage) located under oil level. Each tap shall be 2.5% of rated primary voltage.		
19	Tank filled with oil, complying with ANSI/ASTM D3487 and LUMA requirements, with a PCB concentration of less than 1 PPM (NO PCB).		
20	Internal fault detector type pressure relief valve.		
21	Labels as per sections 9.13 and 9.14.		
22	High (x 2) and Low (x 3) tension, grey porcelain insulated bushings as per NEMA with mechanical type connectors, tin-plated, for CU and AL conductors.		
23	Surge arrester mounting bracket provision as per section 9.20.		

NOTE: This table is only a checklist for reference. The compliance shall be with the complete document. Filling out the table with "PASS" won't be accepted as a compliance without the technical information required to certify it.

4350.016 Distribution Transformer Pole-Type (10-28-2024)

Final Audit Report 2024-10-28

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