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GUIDE FOR FREQUENCY OF SAMPLING EXTRUDED DIELECTRIC POWER, CONTROL, INSTRUMENTATION, AND PORTABLE CABLES FOR TEST

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Guide for Frequency of Sampling Extruded Dielectric Power, Control, Instrumentation, and Portable Cables for Test

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Foreword

This Guide for Frequency of Sampling of Extruded Dielectric Power, Control, Instrumentation, and Portable Cables for Test was developed by the Insulated Cable Engineers Association, Inc. and was approved by the National Electrical Manufacturers Association.

ICEA/NEMA Standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturers and the user and to assist the user in selecting and obtaining the proper product for his or her particular need. The user of this Standards Publication is cautioned to observe any health or safety regulations and rules relative to the use of the test procedures covered by this document.

Requests for interpretation of this Standard must be submitted in writing to the Insulated Cable Engineers Association, Inc., P.O. Box 1568, Carrollton, GA 30117. An official written interpretation will be provided by the Association.

Suggestions for improvement gained in the use of this publication will be welcomed by the Association**.**

Scope

This guide provides a combination of plans for the frequencies at which cable samples may be obtained for tests to determine conformance to the appropriate requirements of ICEA Standards Publications. Valid statistical sampling frequencies other than those listed herein may be acceptable if evidence of statistical control can be demonstrated. This guide applies only to extruded dielectric power, control, instrumentation, and portable cables.

This guide does not apply to those requirements to which each production or shipping length of completed cable must comply as specified in the applicable ICEA Standards.

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Section 1
GUIDE FOR SAMPLING FREQUENCIES

1.1 DEFINITIONS

The following definitions apply to this guide.

sample: A piece or section of cable taken from a production or shipping length or small quantity taken from a lot of material before application to the cable.

specimen: A test unit prepared from a sample.

sampling plan: A procedure for taking samples as a function of the number of production or shipping lengths or reels or quantity of cable. (The eleven sampling plans used in this ICEA guide are shown in Section 2.)

lot: A quantity of cable or material produced at the same location under the same manufacturing conditions during the same time period.

metric conversion: To convert feet to meters, multiply by 0.305. To convert kcmil to square millimeters, multiply by 0.507. To convert inches to millimeters, multiply by 25.4.

1.2 SELECTION OF SAMPLES

1.2.1 Sample for Tests on Cable or Specimens from Cable

Each cable sample shall be taken from an accessible end of different coils or reels, selected at random. Each sample shall be traceable to the coil or reel from which it was selected.

1.2.2 Samples for Tests on Conducting Materials Intended for Extrusion

One sample of material for each specified test shall be molded from each lot of material intended for extrusion on cable.

1.2.3 Sample Plans for Other Tests

A sampling plan for other tests specified in an ICEA Standards Publication shall be selected in accordance with Section 3.

1.3 SAMPLE CONFORMANCE

If all of the samples pass the test specified in a standard, the quantity of cable that they represent shall be considered as meeting the requirements of that standard.

1.4 RESAMPLING

If any sample fails to pass a test specified in a standard, the length of cable from which the sample was taken shall be considered as not meeting the requirements of that standard and another sample shall be taken from each of two other lengths of cable in the quantity of cable under test. If either of the second samples fail to pass the test, the quantity of cable shall be considered as not meeting the requirements of this standard. If both such second samples pass the test, the quantity of cable (except the length represented by the first sample) shall be considered as meeting the requirements of the standard.

Failure of any sample shall not preclude resampling and retesting the length of cable from which the original sample was taken.

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Section 2
SAMPLING PLAN

Plan A

Extruder Run Length - feet (meters)	Conductor Size - kcmil (mm^2)	Number of Samples
less than 2,000 (610)	less than 250 (127)	0
2,000 to 50,000 (610 to 15,250)	less than 250 (127)	1
each additional 50,000 (15,250)	less than 250 (127)	1
less than 1,000 (305)	250 (127) and larger	0
1,000 to 25,000 (305 to 7,625)	250 (127) and larger	1
each additional 25,000 (7,625)	250 (127) and larger	1

Plan B

Quantity of Completed Cable Used in Determining Samples feet (meters)	Number of Samples
0 to 10,000 (3,050)	0
10,001 to 50,000 (610 to15,250)	1
Each Additional 100,000 (30,500)	1

Plan C

One test for each 50,000 feet (15,250 m) of cable or at least once per cable core extruder run.

Plan D

Three samples shall be taken per insulation extruder run. The samples shall be taken near the beginning, near the middle and near the end of each extruder run. The middle sample shall be eliminated if the extruder run is to be shipped in one continuous length.

Plan E

Type Test:

For Insulation and Polymeric Shield Materials - One sample to be tested and no other samples need be tested unless the material formula has been changed. Test report will be available upon request.

For Completed Cable Designs - One sample to be tested and no other samples need be tested unless insulation type, outer jacket, or cable design has been changed. Test report will be available upon request but not necessarily on purchaser's exact conductor size and voltage level.

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Plan F

One sample from each end of a manufacturer's master length. One sample from the outer end of each length is sufficient if at least one sample is taken every 10,000 feet (3,050 m).

Plan G

One test for each 50,000 feet (15,250 m) or at least once per jacket extruder run.

Plan H

One test per shipping length.

Plan I

Each lot of material intended for extrusion on the cable.

Plan J

Quantity of Shipping Lengths Per Extruder Run	Number of Tests
1 - 2	each shipping length
3 - 19	2
20 and greater	10% of shipping lengths (Fractions shall be rounded to the next higher integer value)

Plan K

Once per month per extruder line.

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Section 3
SCHEDULE OF TESTS AND APPLICABLE SAMPLING PLANS

Test	Conductor Stress Control Layer	0-2000 Volt Insulation	2001-46 kV Insulation	Insulation Shield	Jacket	Cable
Electrical						
Conductor dc Resistance						100%
Voltage Tests						100%
Insulation Resistance		E	E			
Dissipation Factor, Capacitance, Permittivity		E	E			
Accelerated Water Absorption Test (EM-60)		E	E			
Permittivity and Voltage Withstand for Nonconducting Stress Control Layers	I					
Specific Surface Resisitivity						E
U-Bend Discharge Resistance						E
Track Resistance						E
Volume Resistivity	I			I		
Dielectric Constant and Dissipation Factor			E			
Semiconducting Jacket Radial Resistivity					G	
Dry Electric Test for EPR Class III Insulation						E
Discharge Resistance Test for EPR Class IV						K
Dissipation Factor Characterization Test						E
Accelerated Water Treeing Test						E
Thermomechanical Qualification Test						E
Dielectric Strength Retention		A				
Short-Term Dielectric Strength						C
Cold Bend/Dielectric Strength						C
Dimensional Measurements						
Thickness of Components over a Conductor	J	J	J	J	J	J
Diameter over cable components			F	F		F
Indent				G		
Protrusion, and Irregularity	F			F		
Physical Demands						
Adhesion (Stripping Force)				D		
Cold Bend		A			A	
Heat Distortion		A			A	
Flexibility Test for Interlocked Armor						B
Tear Resistance					G	

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Test	Conductor Stress Control Layer	0-2000 Volt Insulation	2001-46 kV Insulation	Insulation Shield	Jacket	Cable
Physical Demands (continued)						
Gravimeteric Water Absorption		E			E	
Hot Creep Test		D	D		G	
Vertical Tray Flame Test						E
Tensile Strength Test		A	A		G	
Tensile Stress Test		A			G	
Elongation Test	I	A	A	I	G	
Set Test		A			G	
Oil Immersion Test		A			A	
Brittleness	E			E	E	
Absorption Coefficient		E			E	
Heat Shock		A			A	
Environmental Cracking		E			E	
Flexibility Test for Continuous Corrugated Armor						B
Shrinkback Test			C			
Wafer Boil Test	D			D		
Air Pressure Aging		A				
Crack Resistance (Wrap)		A				
Flame Resistance		C				
Ozone Resistance		C				
Mineral Filler Content (Braided Cables)					A	C
Melting					A	C
Dripping					A	C
Bending (Braided Cable)					A	C

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