

Conditional List
a(1)
December 2008

a - Insulators, pin type (polymer)

Manufacturer	Conditions
Hendrix* HPI-55-3, 12.5/7.2 kV, ANSI Class 55-3 HPI-55-4, 12.5/7.2 kV, ANSI Class 55-4 HPI-25-J-02, 24.9/14.4 kV, ANSI Class 56-1	To obtain experience.

*Does not have metal thimble.

ae - Surge (lightning) Arrester, Distribution Class

SiC Type

<u>Manufacturer</u>	<u>Type</u>	<u>Ratings, kV</u>	<u>Housing</u>	<u>Duty</u>
General Electric	Alugard	9, 10, 18	Porcelain	Heavy
Kearney/Cooper Power Systems	Unigap	9, 10, 18	Porcelain	Heavy

MOV Type

<u>Manufacturer</u>	<u>Type</u>	<u>Ratings, kV</u>	<u>Housing</u>	<u>Duty</u>
Cooper Power Systems	AZL VariSTAR	9, 10, 18, 27	Porcelain	Heavy

ae - Surge (Lightning) Arresters, Substation*

SiC Type				
Manufacturer	Type	Accepted Ratings - kV	Housing	Manufacturer's Classification
General Electric	Alugard	3, 9, 10, 18	Porcelain	Distribution
Kearney/Cooper Power Systems	Unigap	3, 9, 10, 18	Porcelain	Distribution

MOV Type				
Manufacturer	Type	Accepted Ratings - kV	Housing	Manufacturer's Classification
Hubbell Power Systems (Ohio Brass)	DynaVar			
	VLA	3-27	Porcelain	Station
	VL	3-48	Porcelain	Station
	VN	54-312	Porcelain	Station

* For instructions concerning application at substations, refer to RUS Bulletin 1724E-300, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage ratings in accordance with the line voltage and the type of construction (grounded or ungrounded).

ae - Surge (Lightning) Arresters, Distribution Class

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type				
Manufacturer	Type	Ratings, kV	Housing	Duty
ABB	Polim-D	9,10,18,27	Polymer	Heavy
Cooper Power Systems	AZS VariSTAR	9,10,18,27	Porcelain	Normal
	UNS Ultra Sil Housed VariSTAR	9,10,18,27	Polymer	Normal
	UHS Ultra Sil Housed VariSTAR	9,10,18,27	Polymer	Heavy
General Electric	Tranquell, 9L23 Series	9,10,18,27	Polymer	Heavy
Hubbell Power Systems (Ohio Brass)	DynaVar PDV-65	9,10,18,27	Polymer	Normal
	PDV-100 Optima	9,10,18,27	Polymer	Heavy
Joslyn	ZNP	9,10,18,27	Polymer	Normal
	ZHP	9,10,18,27	Polymer	Heavy
Raychem Corporation	HDA Series	9,10,18,27	Polymer	Normal
Tyco	DAH	9,10,18,27	Polymer	Heavy

MOV Type (Internally Gapped)				
Manufacturer	Type	Ratings, kV	Housing	Duty
Cooper Power Systems	AZL500 VariGAP	9,10,18,27	Porcelain	Heavy
	CPS AZS500 VariGAP	9,10,18,27	Polymer	Normal
	UNG UltraSIL VariGAP	9,10,18,27	Polymer	Normal
	UHG UltraSIL VariGAP	9,10,18,27	Polymer	Heavy

ae - Surge Arrester, Substation*

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type

Manufacturer	Type	Accepted Ratings - kV	Housing	Manufacturer's Classification
ABB	XPI-III	9, 10, 18, 27	Polymer	Intermediate
	XPS	9, 10, 18, 27	Polymer	Station
	EXLIM-R	9, 10, 18, 27	Porcelain	Station
	EXLIM-Q	9, 10, 18, 27	Porcelain	Station
Cooper Power Systems	VariStar	3-312	Porcelain	Station
	VariStar AZF	3-120	Porcelain	Intermediate
	VariSTAR US	120-140	Polymer	Station – 5.6 kJ/kV ⁽¹⁾
	VariSTAR UI	3-108	Polymer	Intermediate
	VariSTAR US	3-108	Polymer	Station - 3.4 kJ/kV ⁽¹⁾
	VariSTAR US	3-108	Polymer	Station - 3.4 kJ/kV
	VariSTAR UH	3-108	Polymer	Station - 5.6 kJ/kV
	VariSTAR UH	3-108	Polymer	Station - 5.6 kJ/kV ⁽¹⁾
	VariSTAR UH	120-140	Polymer	Station - 8.9 kJ/kV ⁽¹⁾
VariSTAR UX	3-108	Polymer	Station - 8.9 kJ/kV ⁽¹⁾	
General Electric	Tranquell	2.7-612	Porcelain	Station
	Tranquell	3-120	Porcelain	Intermediate
Hubbell Power Systems (Ohio Brass)	PVI-LP	3-72	Polymer	Intermediate
	PVIA	3-72	Polymer	Intermediate
	DynaVar Type PVI	3-144	Polymer	Intermediate
	DynaVar Type PVN	3-228	Polymer	Station
	DynaVar Type SVN	54-444	Polymer	Station
Joslyn	Type ZS	3-240	Porcelain	Station
	Type ZSH	258-468	Porcelain	Station
	Type ZIP	3-120	Polymer	Intermediate
	Type ZSP	3-144	Polymer	Station
MagneTek	ZSE-E2A	3-39	Porcelain	Station
	ZSE-E3A	45-312	Porcelain	Station
Siemens Power	3EQ1	36-240	Polymer	Station
	3EQ4	96-444	Polymer	Station
	3EP2	12-384	Porcelain	Station
	3EP4	12-150	Porcelain	Station

*For instructions concerning application at substations refer to RUS Bulletin 1724E-300, "Design Guide for Rural Substations." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

(1) Energy ratings based on single impulse ratings

an - Transformers, Power
 Three-Phase, Step-Down
 for Distribution Substation Use

Conditions for Acceptance: "E" - To obtain experience
 "T" - Manufacturer to furnish RUS with satisfactory test results
 (Only performance specifications have been submitted)

Manufacturer	Primary Voltage - kV	Nominal OA Capacity	
		750 to 3750 kVA	5 to 30 MVA
<u>Virginia Transformer</u>	34.4	E	-
	67.0	-	E
	115	-	E
	138	-	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB type UZE and Reinhausen type RMV-2 tap changers

<u>WEG-Voltran</u>	67.0	-	E
	115	-	E
	138	-	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using Reinhausen type RMV-II load tap changers.

Howard Industries	67.0	-	E
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All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

av - Conductor, ACSR

Applicable Specification: ASTM Specification B 232

Preferred Sizes:

<u>Distribution</u>	<u>Transmission</u>
4 - 6/1	1/0 - 6/1
4 - 7/1	2/0 - 6/1
2 - 6/1	3/0 - 6/1
2 - 7/1	4/0 - 6/1
1/0 - 6/1	266.8 kcmil - 26/7
2/0 - 6/1	336.4 kcmil - 26/7
3/0 - 6/1	477 kcmil - 26/7
4/0 - 6/1	556.5 kcmil - 26/7
266.8 kcmil 18/1	795 kcmil - 26/7
336.4 kcmil 18/1	954 kcmil - 54/7
477 kcmil 18/1	

NOTE: Larger sizes may be used where the engineer's study shows they are required.

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable
Conductores Monterrey S.A. de C.V.
Conдумex
General Cable
Kobrex S.A. de C.V.
Midal Cables Ltd.
Nehring
Nexans Canada
Nexans Korea
Noranda
Phelps Dodge
Phelps Dodge - Honduras
Prysmian
Southwire
Synergy Cables USA, Ltd.
Taihan Electric Wire

NOTES

1. Conductors with 18/1 stranding have different sag characteristics than conductors with 6/1 or 26/7 stranding. This difference in sag characteristics must be taken into consideration in the line design.
2. 266.8 kcmil 26/7, 336.4 kcmil 26/7, and 477 kcmil 26/7 may be used for distribution underbuild on transmission lines.

av - Conductor, Aluminum Alloy

Applicable Specification: ASTM Specification B399

Preferred Sizes:

DISTRIBUTION		TRANSMISSION	
6201	ACSR Equiv.	6201	ACSR Equiv.
48,690 cmil - 7 str.*	4	123,300 cmil - 7 str.**	1/0
77,470 cmil - 7 str.*	2	155,400 cmil - 7 str.**	2/0
123,300 cmil - 7 str.	1/0	195,700 cmil - 7 str.**	3/0
155,400 cmil - 7 str.	2/0	246,900 cmil - 7 str.	4/0
195,700 cmil - 7 str.	3/0	312,800 cmil - 19 str.	266,800 cmil
246,900 cmil - 7 str.	4/0	394,500 cmil - 19 str.	336,400 cmil
		559,500 cmil - 19 str.	477,000 cmil
		652,400 cmil - 19 str.	556,500 cmil
		927,200 cmil - 37 str.	795,000 cmil

*Not recommended for multiphase lines with span lengths exceeding 300 ft.

**Not recommended for suspension type construction.

The following manufacturers have shown compliance with the applicable specifications:

<u>Manufacturer</u>	<u>Type</u>
Alcan	6201
Conductores Monterrey S.A. de C.V.	6201
General Cable	6201
Midal Cables Ltd.	6201
Phelps Dodge	6201
Southwire	6201

U hv - Cable, Underground
15 kV and 25 kV Cable

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Crosslinked Polyethylene (XLP) (a) indicates Union Carbide 4201 XLP (b) indicates BP 521 XLP Tree-retardant Crosslinked Polyethylene (XLP-TR) (1) indicates Union Carbide 4202 XLP-TR (2) indicates BP H119Y XLP-TR (3) indicates BP H118Y XLP-TR (4) indicates LG XL8080TR
Neutral:	Ethylene Propylene Rubber (EPR)
Jacket:	Copper Concentric Neutral High Molecular Weight Polyethylene

<u>Manufacturer</u>	<u>Insulation(s)</u>	<u>Flat Strap Neutral Available</u>
Conductores Monterrey, S.A. de C.V.	XLP (a), XLP-TR (1), EPR	No
Condumex	XLP (a), XLP-TR (1), EPR	No
General Cable	XLP (a,b), XLP-TR (1,3), EPR	Yes
Gaon Cable Co., Ltd.	EPR, XLP-TR (4)	No
Hendrix	XLP (a), XLP-TR (1, 2, 3), EPR	No
Hubbell (Kerite)	EPR	Yes
Nexans Canada	XLP (a), XLP-TR (1), EPR	No
Nexans Italia	EPR	No
Okonite	XLP (a), XLP-TR (1), EPR	Yes
Phelps Dodge	XLP (a,b), XLP-TR (1,3), EPR	Yes
Prysmian	XLP (a), XLP-TR (1), EPR	Yes
Rome	XLP (a), XLP-TR (1), EPR	Yes
Southwire	XLP (a), XLP-TR (1), EPR	No
Synergy Cables	XLP-TR (1), EPR	No