PERFORMANCE IN GALLOPING CONTROL

A COMPARISON OF AR PRODUCTS TO INTERPHASE SPACERS

AR Twister

The primary difference between Interphase Spacers and the AR®Twister is the clamp. The AR®Twister clamp is a patented, core product technology. Once set, the clamp will rotate the conductor through large angles so that galloping never gets going. By comparison, interphase spacers are designed to keep the conductors separated to avoid flashover. The net result of using the interphase spacer is that phases or circuits tend to gallop in synchrony.

Side by Side Comparison	Interphase Spacers	AR Twister
Material	Composite resin. Silicon rubber over fiberglass. Lightweight & flexible. Ceramic Insulators – heavier weight & fragile. Fixed and rigid.	Aluminum. Lightweight. AR®Clamp – core twisting mechanism; Piston, Canister and Slider models use different weight mechanism to achieve optimum moment arm.
Performance	Prevents flashover; does not control galloping.	Controls Aeolian vibration and galloping (patented concept).
Service Life	Consistent performance – service life undetermined (estimates ~ 7 years) Frequent galloping and vibration cause fatigue of movable parts. Silicone material withstands environmental factors for 2-3 years.	Consistent performance – service life 10-15 years. No movable parts to wear out. No RIV, Corona or audible noise. No ongoing maintenance required.
Installation	One or two per span; install at 1/3 point. Install by helicopter or bucket truck.	One or two per phase per span; install at 1/3 point. Install by helicopter or bucket truck.
Twisting Mechanism	Is not designed to create twist of the conductor.	Principal design element – twists at attachment point; gravity induces twisting.
Mechanical Stresses	Tension, bending, fatigue from galloping.	None.
Tolerance for compression stress and vibration on the line	Heavy ice and snow load increases compression stress.	Not a factor. By hanging individually the damper swings freely without compression stress. Designed to alleviate vibration.
Tolerance for high wind, cross winds, extreme climate, environmental (salt, pollution)	May impact useful service life and economics.	No reported failures in any of the stated conditions.

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PERFORMANCE IN GALLOPING CONTROL

A COMPARISON OF AR PRODUCTS TO INTERPHASE SPACERS

WINDAMPER

The primary difference between the Windamper and the Interphase Spacer is the use of aerodynamics. The Windamper operates on two key principles twisting and aerodynamic damping. By twisting at the attachment point to the conductor, the Windamper uses gravity and wind force to induce twisting when galloping conditions occur. The shape of the damper is designed to take advantage of aerodynamic lift forces to twist the conductor and thereby change the wind angle of attack. Interphase Spacers are designed to maintain a separation between phases, yet without a mechanism for twisting, the conductor will continue to gallop.

Side by Side Comparison	**Interphase Spacers**	**WINDAMPER**
Material	Composite resin. Silicon rubber over fiberglass. Lightweight & flexible Ceramic Insulators – heavier weight & fragile.	Aluminum Lightweight for a long span (33lbs max)
Performance	Prevents flashover; does not control galloping	Controls Aeolian vibration and galloping
Service Life	Consistent performance – service life undetermined (estimates ~ 7 years) Frequent galloping and vibration cause fatigue of movable parts. Silicone material withstands environmental factors for 2-3 years.	Consistent performance – service life up to 30 years. No movable parts to wear out. [345kV Wisconsin line installed 1991] [115kV Niagara Falls installed 1968] Both still in service
Installation	# per span based upon span length. Installed over Armor Rods. Install by helicopter or bucket truck.	# per span based upon span length. Installed over Armor Rods. Install by helicopter or bucket truck.
Twisting Mechanism	Is not designed to create twist of the conductor	Principal design element – twists at attachment point; gravity induces twisting
Mechanical Stresses	Tension, bending, fatigue from galloping	none
Tolerance for Compression Stress and vibration on the line	Heavy ice and snow load increases compression stress between the bundles.	Not a factor. By hanging individually the damper swings freely without compression stress. Designed to alleviate vibration
Tolerance for high wind, cross winds, extreme climate, environmental (salt, pollution)	May impact useful service life and economics.	No reported failures in any of the stated conditions.

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