

# What is the Maximum Line Angle for Vise Top Line Post (VTLP) Insulators?

## Covered Conductors

The maximum line angle is not a constant value for all overhead line installations conditions. It depends on multiple factors including the conductor size, span length, horizontal tension, cantilever load induced, Loading Zone, Safety Factors, and the insulator strength rating. In the following, multiple cases are considered:

### Conductor Installed

1. Calculate cantilever load induced for the span, sag and conductor type used and weather loading conditions using NESC safety code.
2. Max line angle is determined when cantilever load equals de-rated VTLP value or **1400 lbs.**, the black nylon bolts breaking strength, whichever is lower.
3. The Sag & Tension Calculation was based on a Heavy Loading Zone.

Note: Vise Top Line Post meets and exceeds ANSI C29.18 2400 lb. cantilever requirement.

Details: Sag & Tension information calculated with **1/2" of ice and 0°F**

Bare Conductor	Code Name	O.D.	Bare Weight	150 ft Ruling Span		300 ft Ruling Span	
				Design Tension 4 psf Wind, 1/2" Ice 0°F	Max. Line Angle	Design Tension 4 psf Wind, 1/2" Ice 0°F	Max. Line Angle
				(lb)	(degrees)	(lb)	(degrees)
#1/O ACSR 6/1 25 kV	Raven	0.928	0.389	1857	25	2504	12
#1/O ACSR 6/1 35 kV	Raven	1.028	0.448	1900	20	2557	11.5
#4/O ACSR 6/1 25 kV	Penguin	1.093	0.599	2400	14	3400	8
#4/O ACSR 6/1 35 kV	Penguin	1.193	0.672	2974	13	3853	7.5
477 ACSR 26/7 25 kV	Hawk	1.398	1.087	4067	9.5	5410	5
477 ACSR 26/7 35 kV	Hawk	1.498	1.185	4053	9.5	5402	5

Details: Sag & Tension information calculated with **No ice and 60°F**

Bare Conductor	Code Name	O.D.	Bare Weight	150 ft Ruling Span		300 ft Ruling Span	
				Design Tension 4 psf Wind, 60°F	Max. Line Angle	Design Tension 4 psf Wind, 60°F	Max. Line Angle
				(lb)	(degrees)	(lb)	(degrees)
#1/O ACSR 6/1	Raven	0.928	0.389	645	19.5	807	16
#1/O ACSR 6/1	Raven	1.028	0.448	678	25.5	850	15.5
#4/O ACSR 6/1	Penguin	1.093	0.599	119	18	1442	11
#4/O ACSR 6/1	Penguin	1.193	0.672	1167	18	1499	10.5
477 ACSR 26/7	Hawk	1.398	1.087	1495	17	2233	8
477 ACSR 26/7	Hawk	1.498	1.185	1533	17	2275	8