

## Sag-Tension Calculation of Conductor

(For tower design purpose only)

*[For reference - Double circuit - HTLS  
Line].*

### Conductor Properties

Conductor Name	<b>Conductor</b>
UTS (Kg)	13289
Area of Conductor (sqmm)	484.5
Wt. Of Conductor (Kg/m)	1.621
Dia. Of Conductor (mm)	28.62
Modulus of Elasticity ( Kg/sqmm)	7036
Coeff. Of linear Expansion (per deg C)	0.0000193

### Initial Condition

Normal Span (m)	350
Wind Pressure on Cond.(Kg/sqm)	166.86
Initial Cond. temp.(deg C)	32
Initial Wind %	0
Initial Cond. tension at above temp, and wind condition (% of UTS OR value in Kg)	22

Note: The tension should be below 22% of UTS in day to day condition and should not exceed 70% of UTS in any condition.

22% of UTS = 2923.58 Kg	70% of UTS = 9302.3 Kg
-------------------------	------------------------

<b>Initial Sag, Ten at 32 deg C, 0% Wind</b>		
Ten (% of UTS)	Ten (kg)	Sag (mts)
22.00	2923.58	8.49

	Standard Conditions						
Temperature (deg C)	0	0	32	32	32	75	80
Pressure ( % of full wind)	0	36	0	75	100	0	0
<b>Resultant Tension (Kg)</b>	<b>3472.18</b>	<b>4492.75</b>	<b>2923.58</b>	<b>5739.17</b>	<b>6891.75</b>	<b>2437.93</b>	<b>2393.98</b>
<b>Resultant Sag (mts)</b>	<b>7.15</b>	<b>#</b>	<b>8.49</b>	<b>#</b>	<b>#</b>	<b>10.18</b>	<b>10.36</b>



**Sag-Tension Calculation of ACSR ZEBRA** [For reference - Multi circuit - HTLS Portion]

**Conductor Properties**

Conductor Name	ACSR ZEBRA
UTS (Kg)	13289
Area of Conductor (sqmm)	484.5
Wt. Of Conductor (Kg/m)	1.621
Dia. Of Conductor (mm)	28.62
Modulus of Elasticity ( Kg/sqmm)	7036
Coeff. Of linear Expansion (per deg C)	0.0000193

**Initial Condition**

Normal Span (m)	350
Wind Pressure on Cond (Kg/sqm)	210.152
Initial Cond. temp.(deg C)	32
Initial Wind %	0
Initial Cond. tension at above temp.and wind condition (% of UTS OR value in Kg)	22

Note: The tension should be below 22% of UTS in day to day condition and should not exceed 70% of UTS in any condition.

22% of UTS = 2923.58 Kg	70% of UTS = 9302.3 Kg
-------------------------	------------------------

Initial Sag, Ten at 32 deg C, 0% Wind		
Ten (% of UTS)	Ten (kg)	Sag (mts)
22.00	2923.58	8.49

	Standard Conditions							Any other condition
	0	0	32	32	32	75	85	
Temperature (deg C)	0	0	32	32	32	75	85	53
Pressure ( % of full wind)	0	36	0	75	100	0	0	0
Resultant Tension (Kg)	3472.18	4925.93	2923.58	6640.50	8034.19	2437.93	2352.04	2659.07
Resultant Sag (mts)	7.149	#	8.490	#	#	10.181	10.553	9.335

PRINT

- Tension WITHIN Indian Standard limits



### Sag-Tension Calculation of Bison

#### Conductor Properties

Conductor Name	<b>bison</b>
UTS (kg)	12336.734
Area of Conductor (sqmm)	431.2
Wt. Of Conductor (kg/m)	1.444
Dia of Conductor (mm)	27
Modulus of Elasticity (kg/sqmm)	7036
Coeff of linear Expansion ( per deg C)	0.0000193

#### Initial Condition

Normal Span (m)	350
Wind Pressure on Cond.(Kg/sqm)	197.152
Initial Cond. temp.(deg C)	32
Initial Wind %	0
Initial Cond. tension at above temp,and wind condition (% of UTS OR value in Kg)	22

<b>Initial Sag, Ten at 32 deg C, 0% Wind</b>		
Ten (% of UTS)	Ten (kg)	Sag (mts)
22.00	2714.08	8.15

	Standard Conditions					Any other condition
Temperature (deg C)	0	32	75	0	32	32
Pressure ( % of full wind)	0	0	0	36	100	75
<b>Resultant Tension (Kg)</b>	<b>3253.95</b>	<b>2714.08</b>	<b>2241.19</b>	<b>4536.54</b>	<b>7262.39</b>	<b>6023.45</b>
<b>Resultant Sag (mts)</b>	<b>6.80</b>	<b>8.15</b>	<b>9.87</b>	<b>#</b>	<b>#</b>	<b>#</b>



### Sag-Tension Calculation of earthwire

#### Conductor Properties

Conductor Name	<b>earthwire</b>
UTS (kg)	6230
Area of Conductor (sqmm)	61.7
Wt. Of Conductor (kg/m)	0.483
Dia of Conductor (mm)	10.05
Modulus of Elasticity (kg/sqmm)	19000
Coeff of linear Expansion ( per deg C)	0.0000115

#### Initial Condition

Normal Span (m)	350
Wind Pressure on Cond.(Kg/sqm)	216.61
Initial Cond. temp.(deg C)	0
Initial Wind %	0
Initial Cond. tension at above temp,and wind condition (% of UTS OR value in Kg)	18.45

<b>Initial Sag, Ten at 0 deg C, 0% Wind</b>		
Ten (% of UTS)	Ten (kg)	Sag (mts)
18.45	1149.44	6.43

	Standard Conditions					Any other condition
Temperature (deg C)	0	32	75	0	32	32
Pressure ( % of full wind)	0	0	0	36	100	75
<b>Resultant Tension (Kg)</b>	<b>1149.44</b>	<b>1015.39</b>	<b>880.85</b>	<b>1749.55</b>	<b>2989.83</b>	<b>2480.57</b>
<b>Resultant Sag (mts)</b>	<b>6.43</b>	<b>7.28</b>	<b>8.40</b>	<b>#</b>	<b>#</b>	<b>#</b>

