

2022 PLS-CADD Advanced Training and User Group

Virtual Compression in Bimetallic Conductors

by

Jesse Kohler, P.E.

Power Line Systems

Conductor Modeling Methods Above Knee Point Temperatures

Full Aluminum Compression

EPRI Test
Virtual Compression

No Aluminum Compression
Bird Cage
Power Line Systems

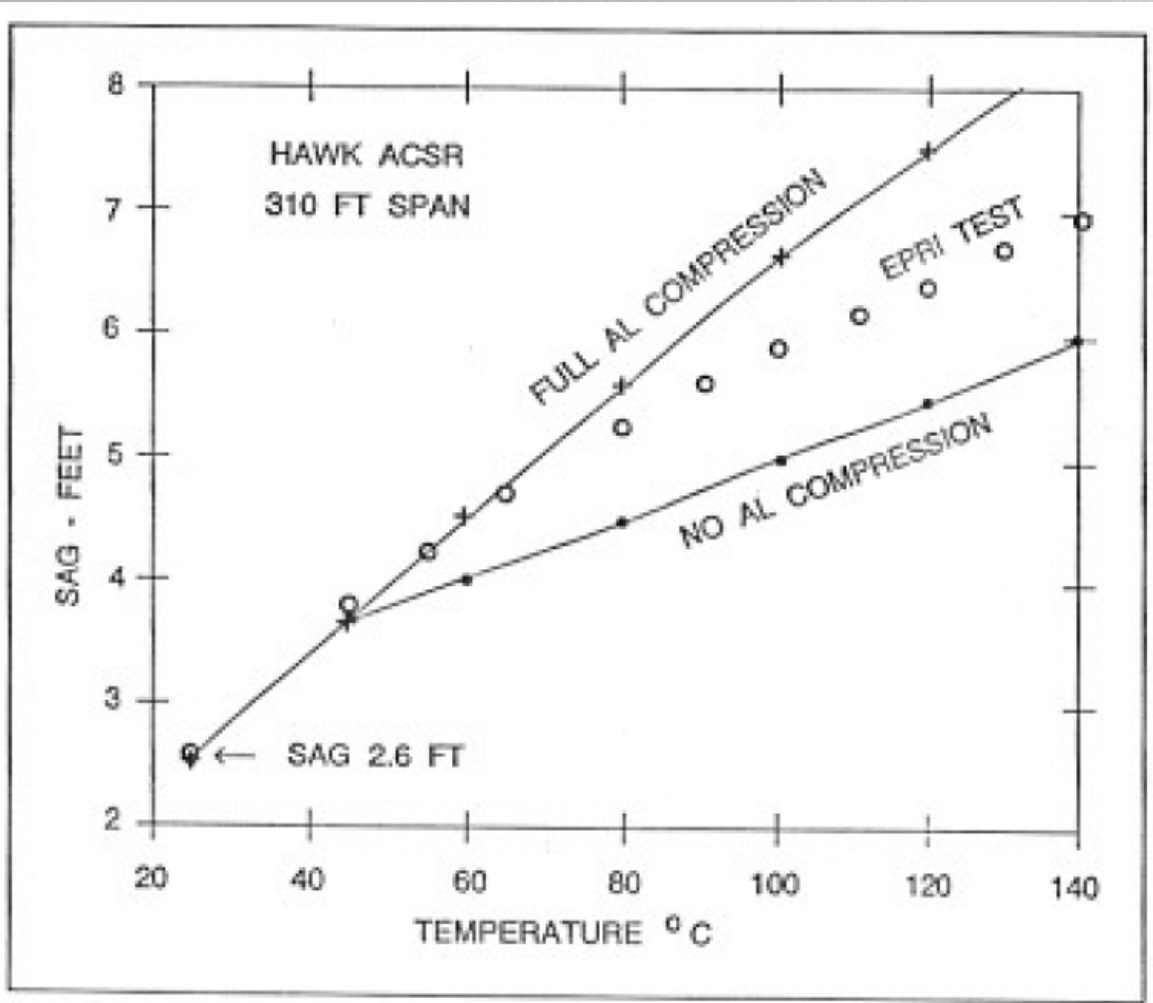
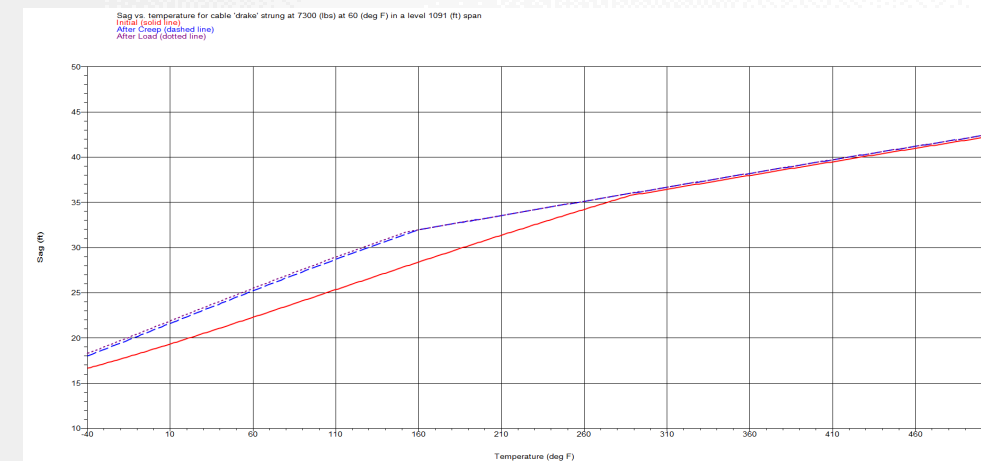
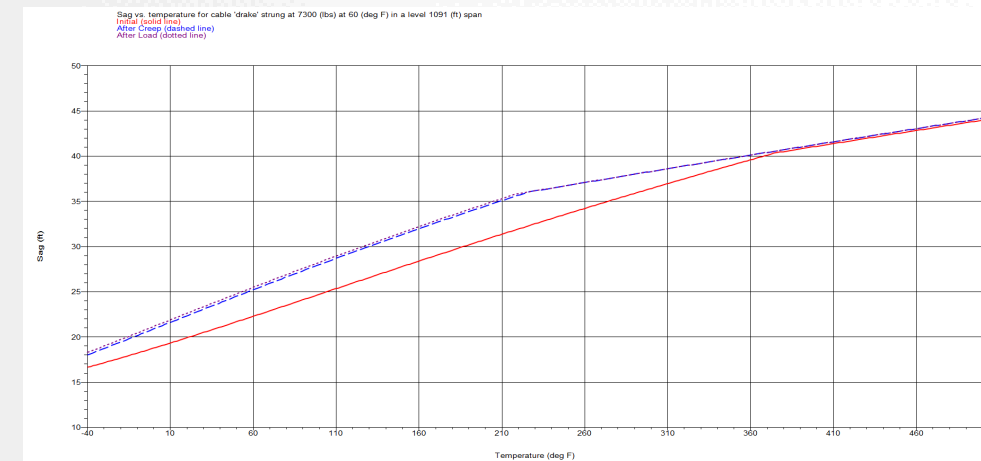
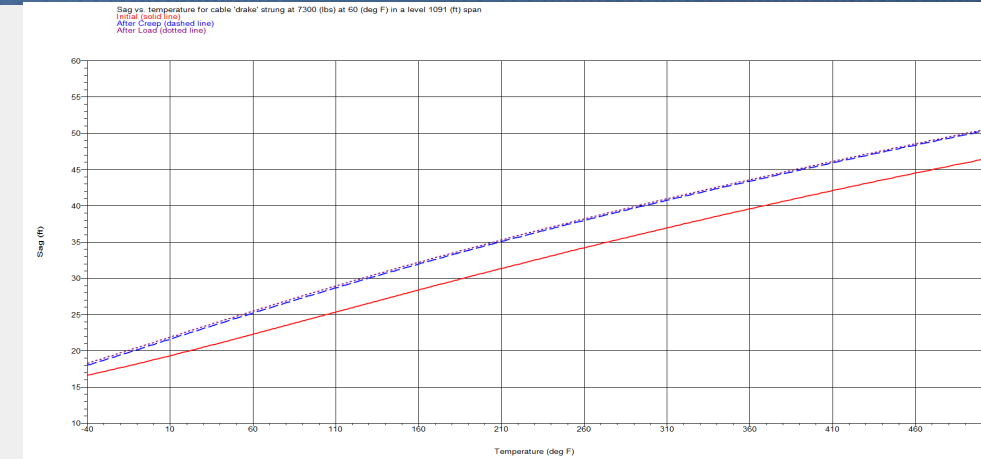


Fig. 2 Calculated and measured sags

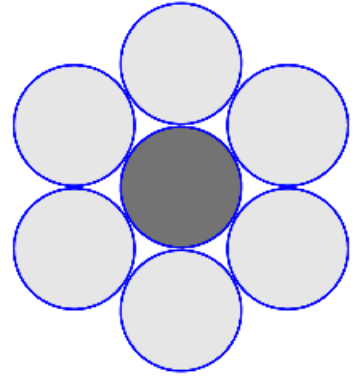
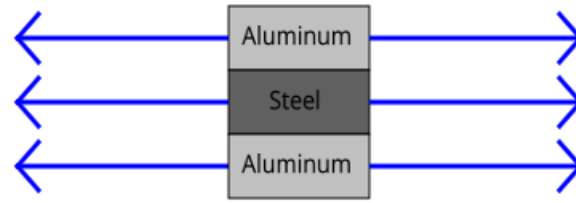
Elongation

AL = 5

ST = 5

Total = 10

Welded Model



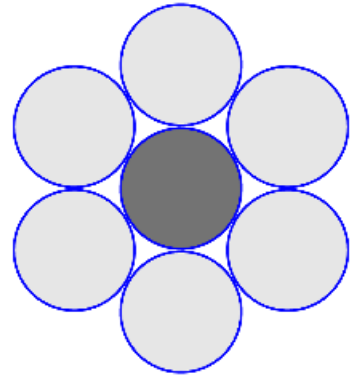
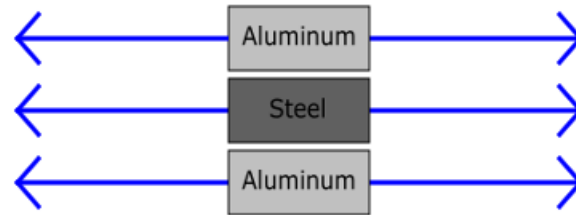
Elongation

AL = 5

ST = 5

Total = 10

Bird Cage Model



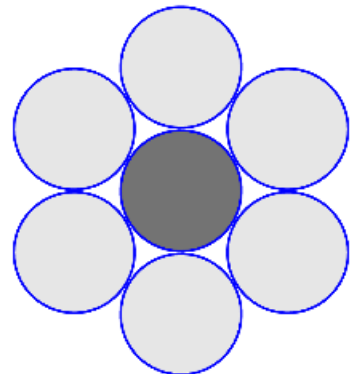
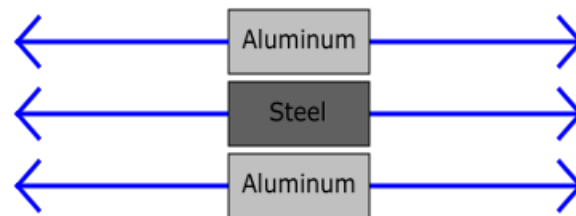
Elongation

AL = 5

ST = 5

Total = 10

Virtual Compression Model



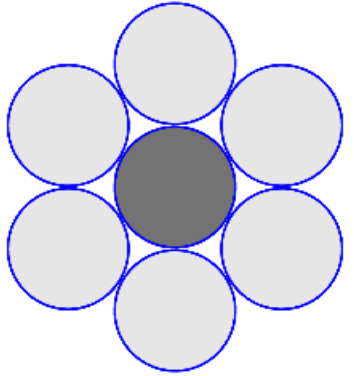
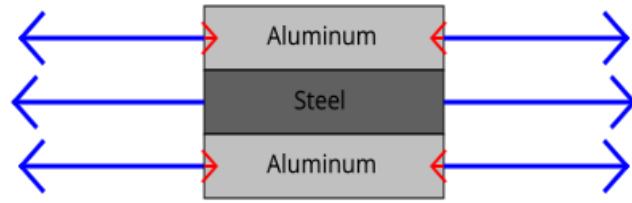
Elongation

AL = 12.5

ST = 12.5

Total = 25

Welded Model



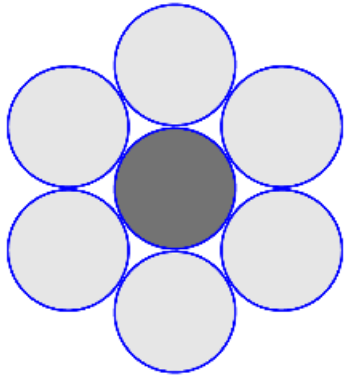
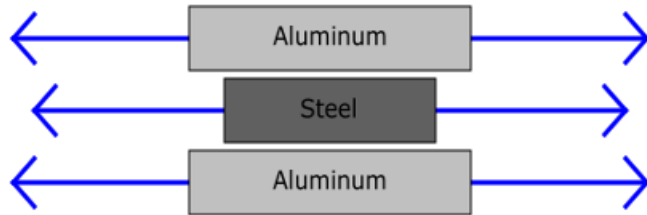
Elongation

AL = 15

ST = 10

Total = 25

Bird Cage Model



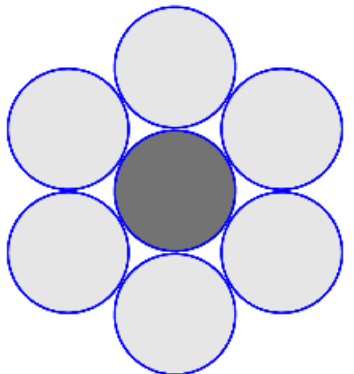
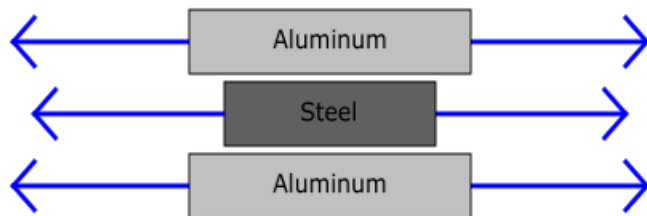
Elongation

AL = 15

ST = 10

Total = 25

Virtual Compression Model



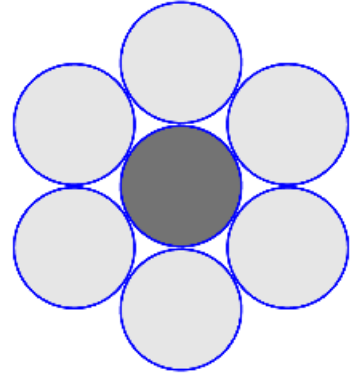
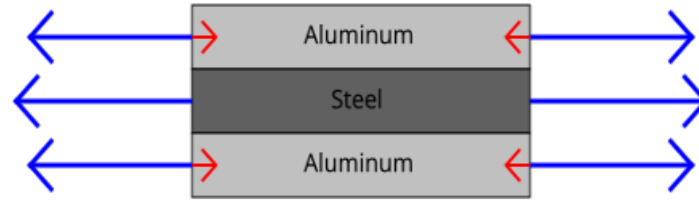
Elongation

AL = 20

ST = 20

Total = 40

Welded Model



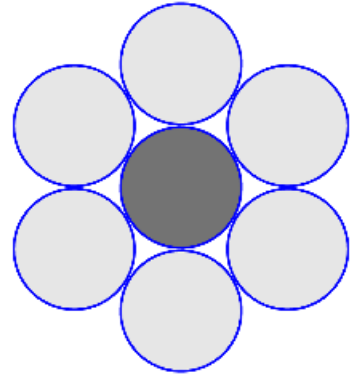
Elongation

AL = 25

ST = 15

Total = 40

Bird Cage Model



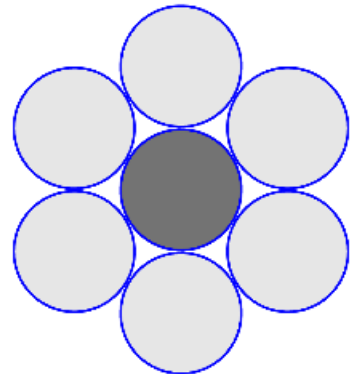
Elongation

AL = 25

ST = 15

Total = 40

Virtual Compression Model



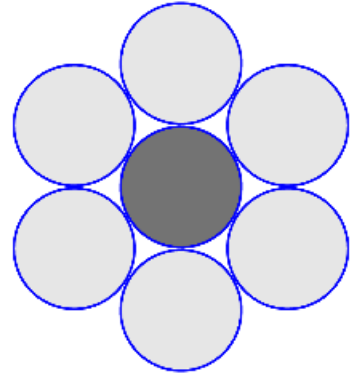
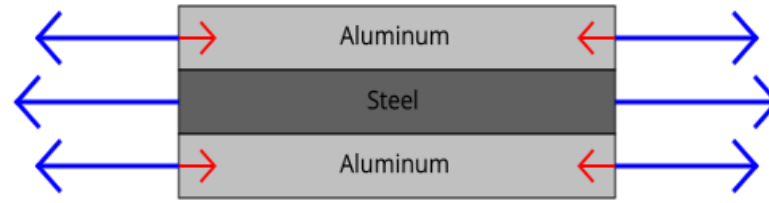
Elongation

AL = 27.5

ST = 27.5

Total = 55

Welded Model



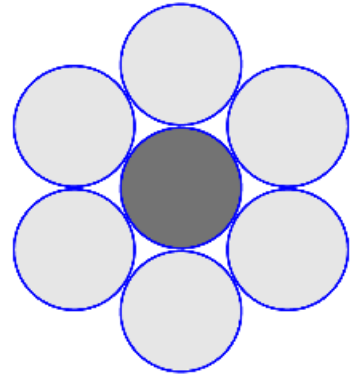
Elongation

AL = 35

ST = 20

Total = 55

Bird Cage Model



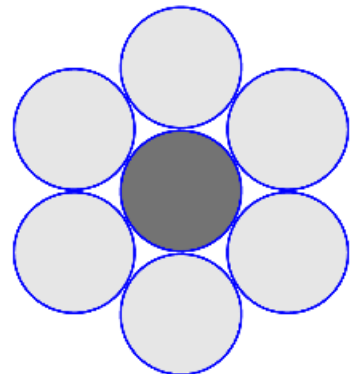
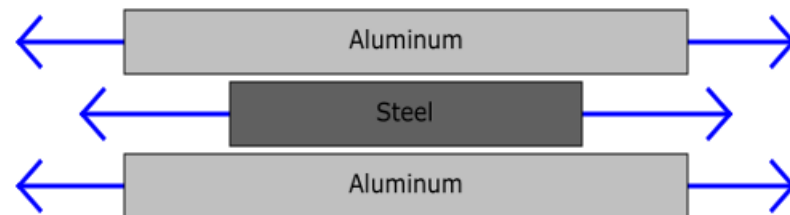
Elongation

AL = 35

ST = 20

Total = 55

Virtual Compression Model



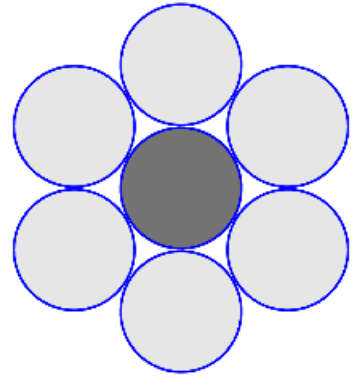
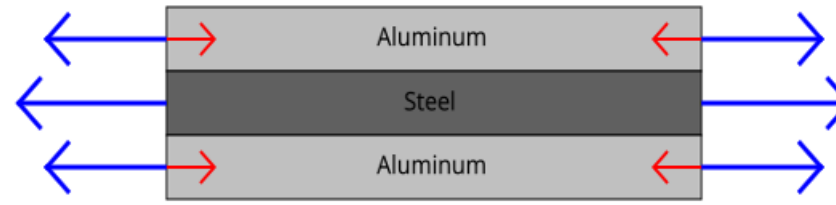
Elongation

AL = 35

ST = 35

Total = 70

Welded Model



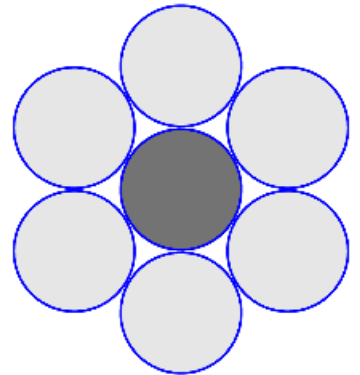
Elongation

AL = 45

ST = 25

Total = 70

Bird Cage Model



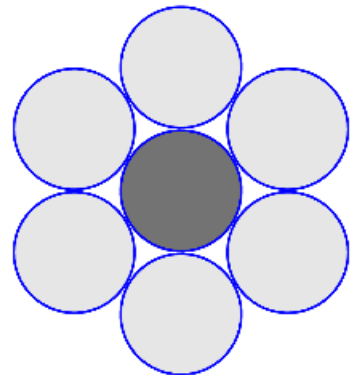
Elongation

AL = 45

ST = 25

Total = 70

Virtual Compression Model



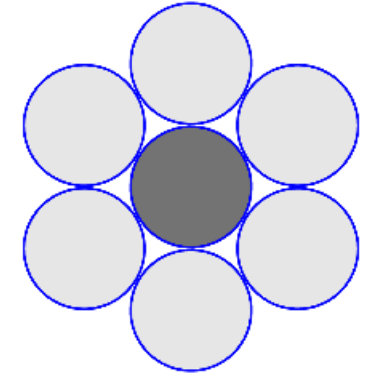
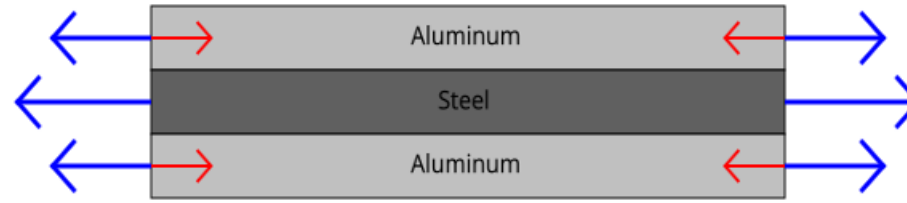
Elongation

AL = 42.5

ST = 42.5

Total = 85

Welded Model



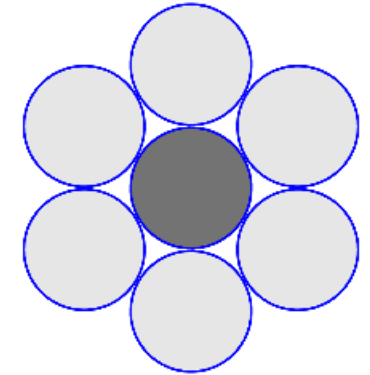
Elongation

AL = 55

ST = 30

Total = 85

Bird Cage Model



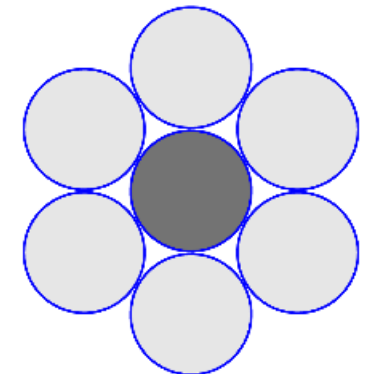
Elongation

AL = 55

ST = 30

Total = 85

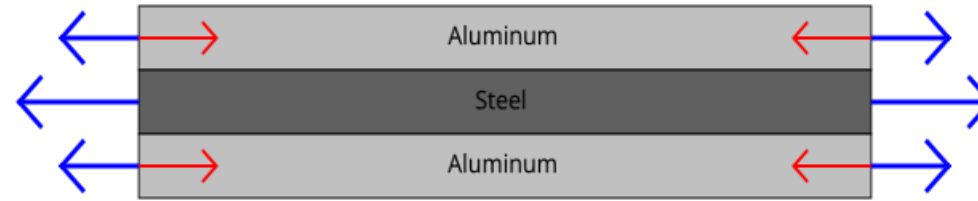
Virtual Compression Model



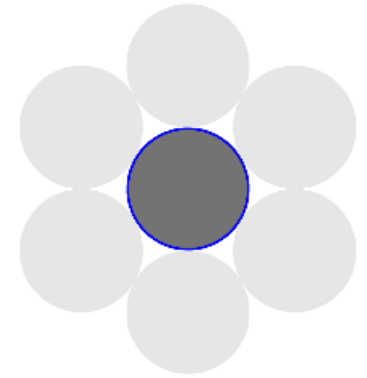
Elongation
 AL = 50
 ST = 50
 Total = 100

***Conductor
 Knee Point***

Welded Model



***Zero Tension
 In Aluminum***



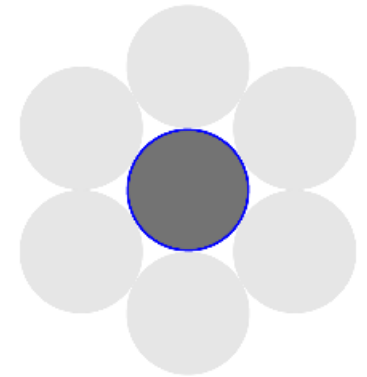
Elongation
 AL = 65
 ST = 35
 Total = 100

***Conductor
 Knee Point***

Bird Cage Model



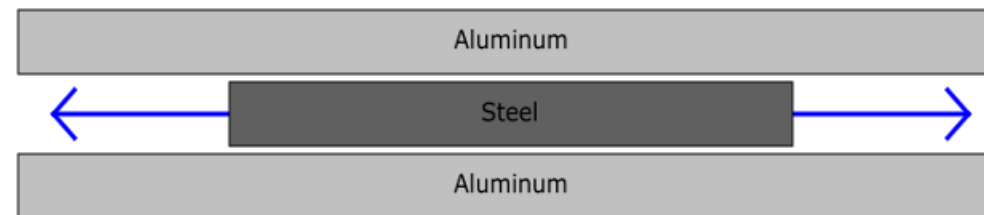
***Zero Tension
 In Aluminum***



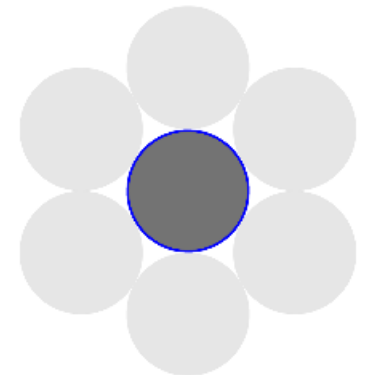
Elongation
 AL = 65
 ST = 35
 Total = 100

***Conductor
 Knee Point***

Virtual Compression Model



***Zero Tension
 In Aluminum***



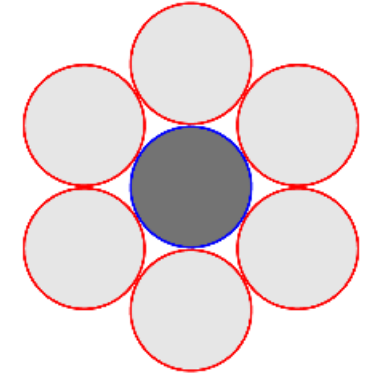
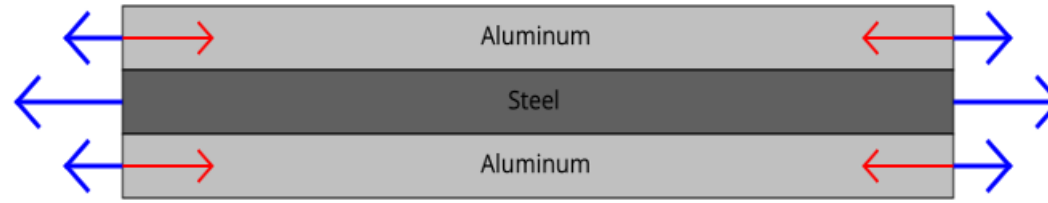
Elongation

AL = 57.5

ST = 57.5

Total = 115

Welded Model



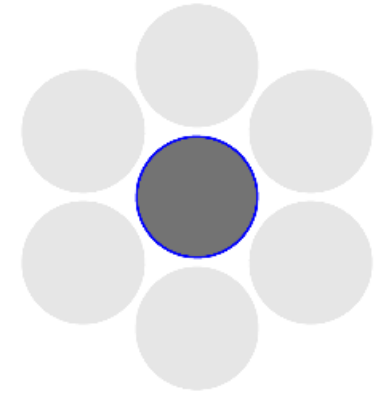
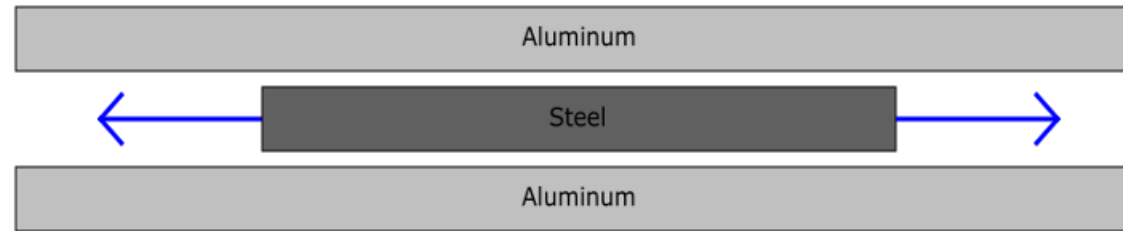
Elongation

AL = 65

ST = 40

Total = 105

Bird Cage Model



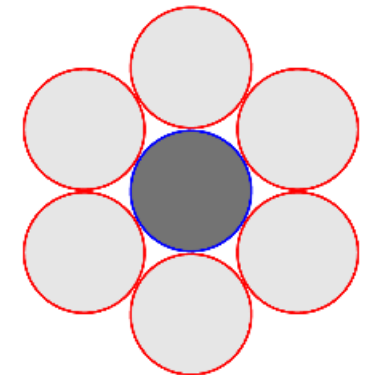
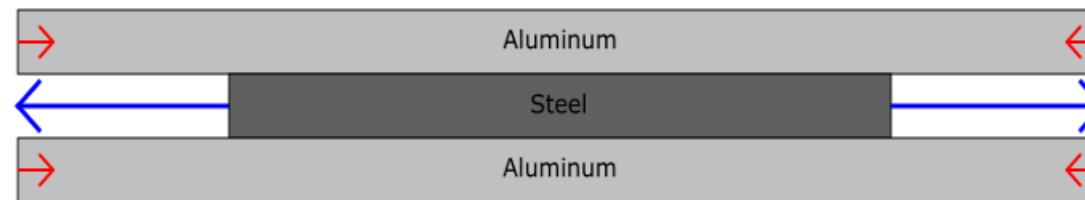
Elongation

AL = 72.5

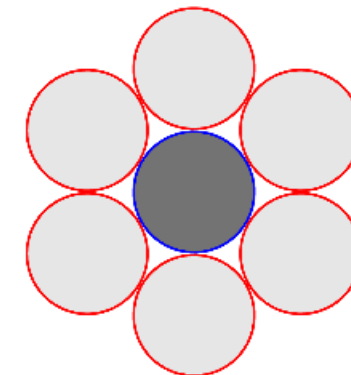
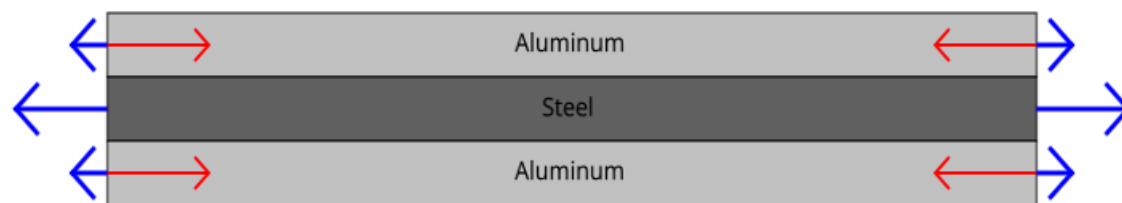
ST = 42.5

Total = 115

Virtual Compression Model



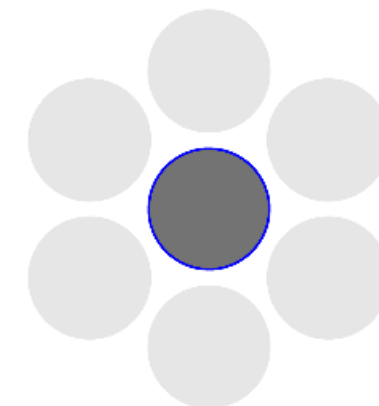
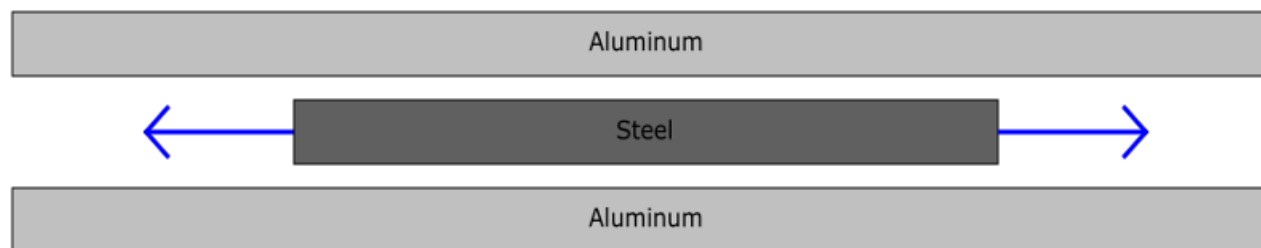
Welded Model



Elongation

AL = 65
ST = 65
Total = 130

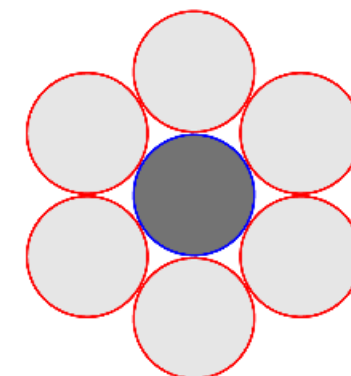
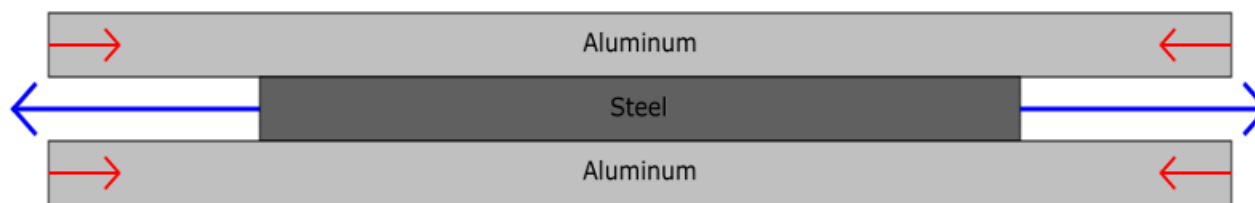
Bird Cage Model



Elongation

AL = 65
ST = 45
Total = 110

Virtual Compression Model



Elongation

AL = 80
ST = 50
Total = 130

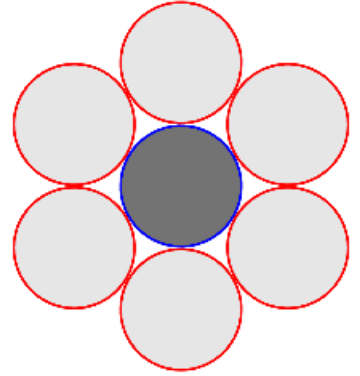
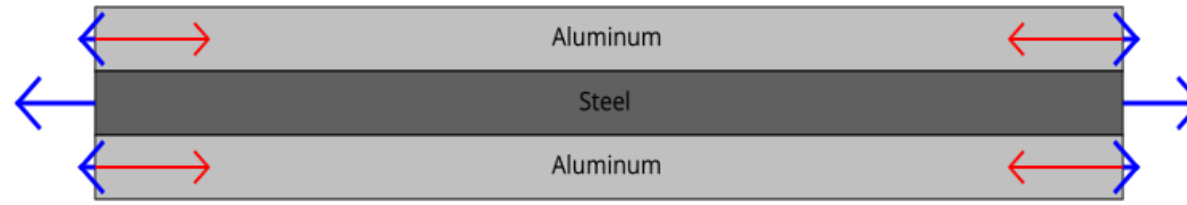
Elongation

AL = 72.5

ST = 72.5

Total = 145

Welded Model



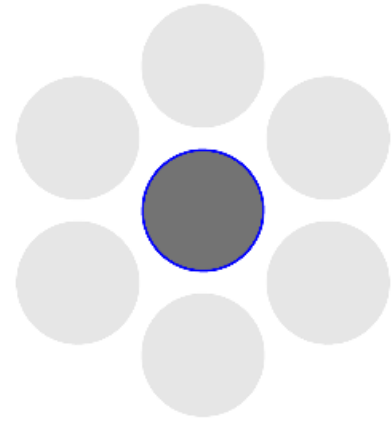
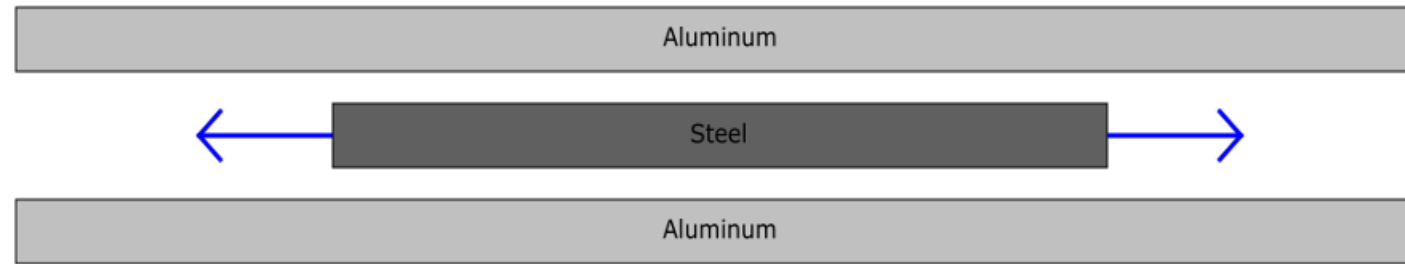
Elongation

AL = 65

ST = 50

Total = 115

Bird Cage Model



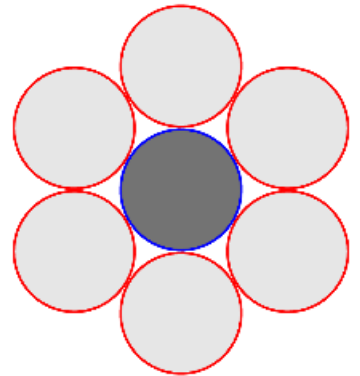
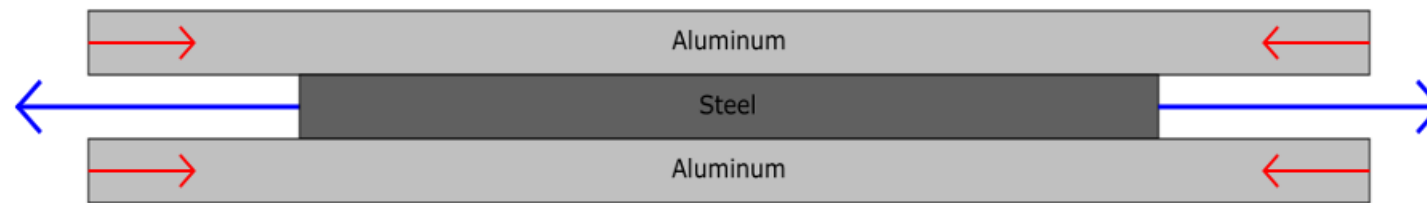
Elongation

AL = 87.5

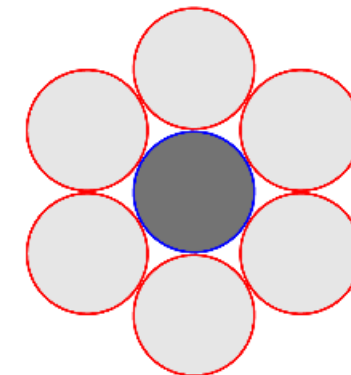
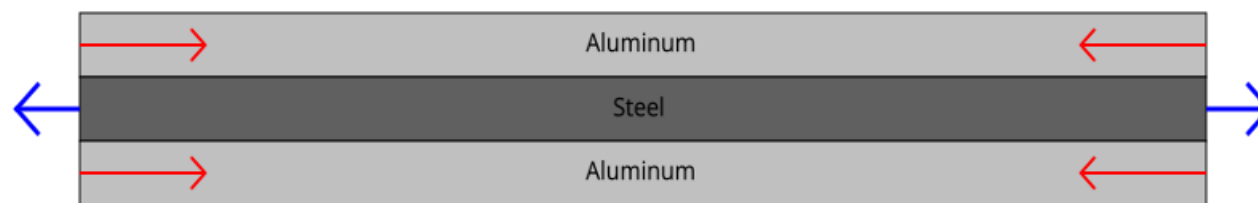
ST = 57.5

Total = 145

Virtual Compression Model



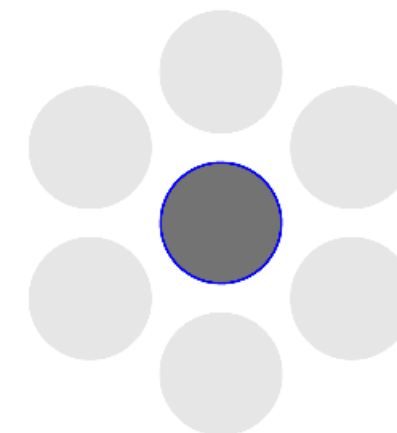
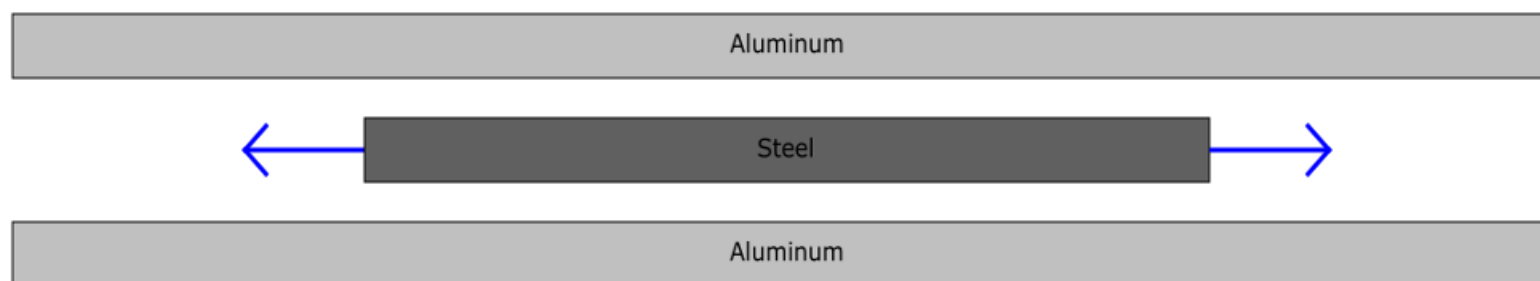
Welded Model



Elongation

AL = 80
ST = 80
Total = 160

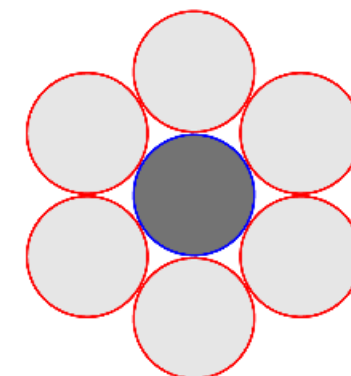
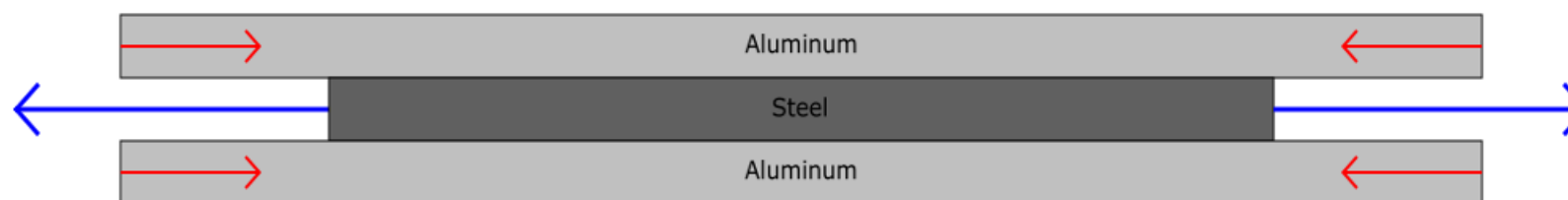
Bird Cage Model



Elongation

AL = 65
ST = 55
Total = 120

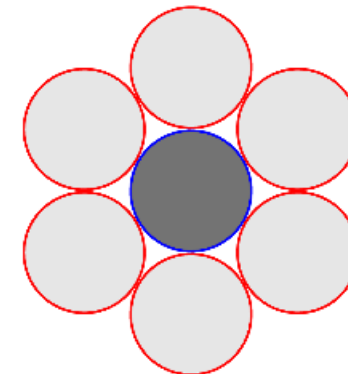
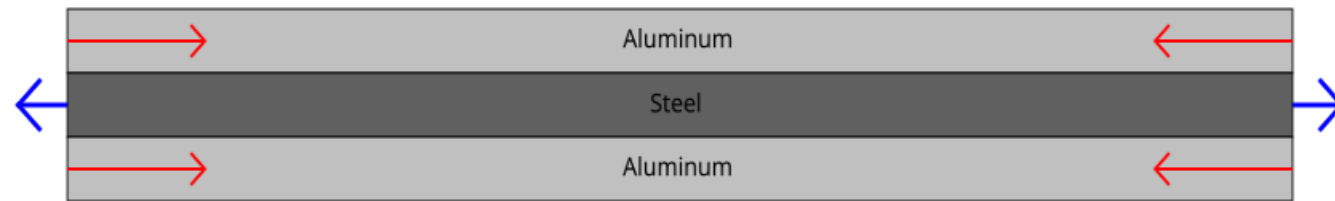
Virtual Compression Model



Elongation

AL = 95
ST = 65
Total = 160

Welded Model



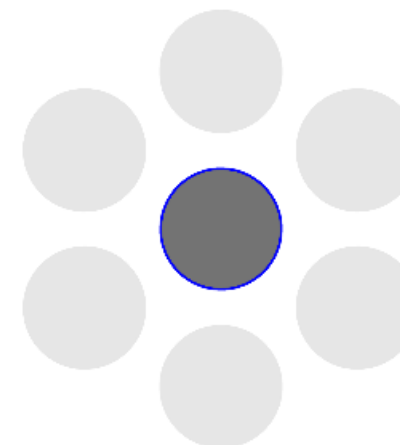
Elongation

AL = 87.5

ST = 87.5

Total = 175

Bird Cage Model



Elongation

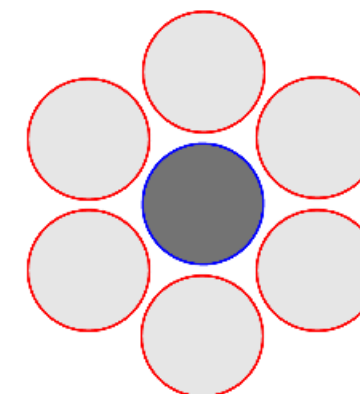
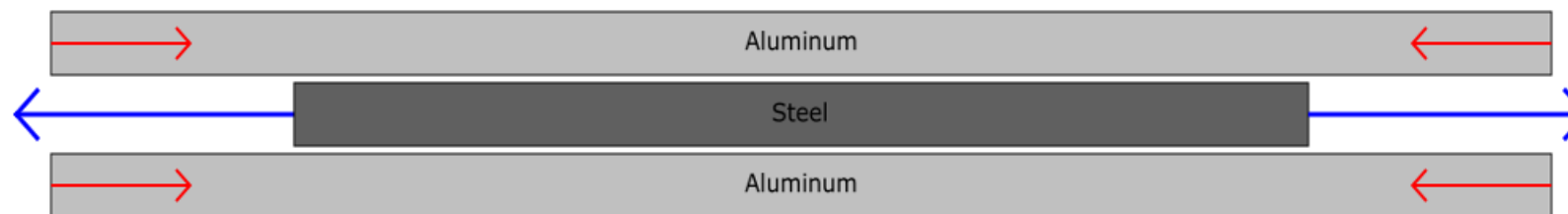
AL = 65

ST = 60

Total = 125

Virtual Compression Model

Compression Limit Exceeded



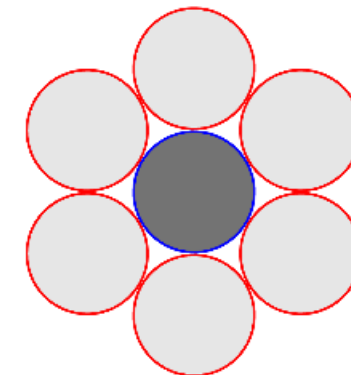
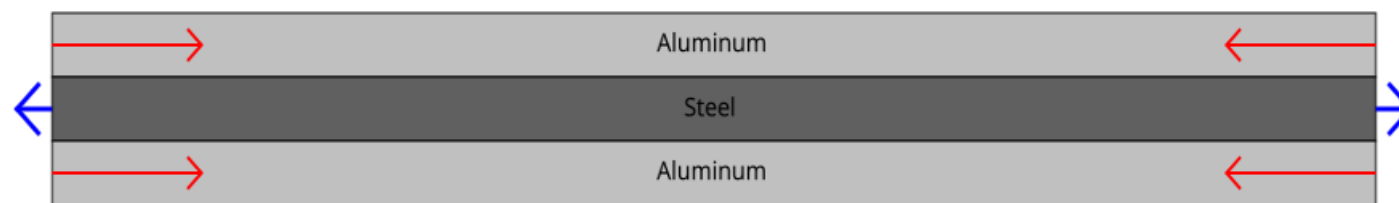
Elongation

AL = 95

ST = 70

Total = 165

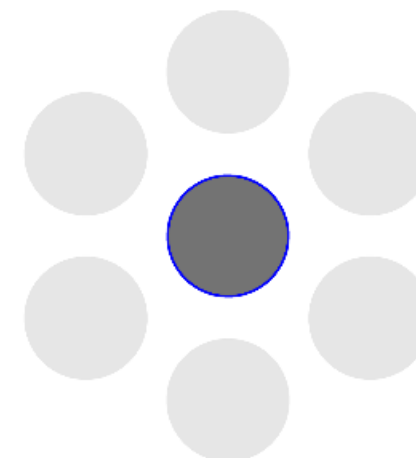
Welded Model



Elongation

AL = 95
ST = 95
Total = 190

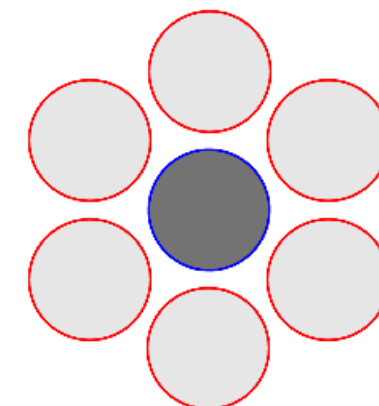
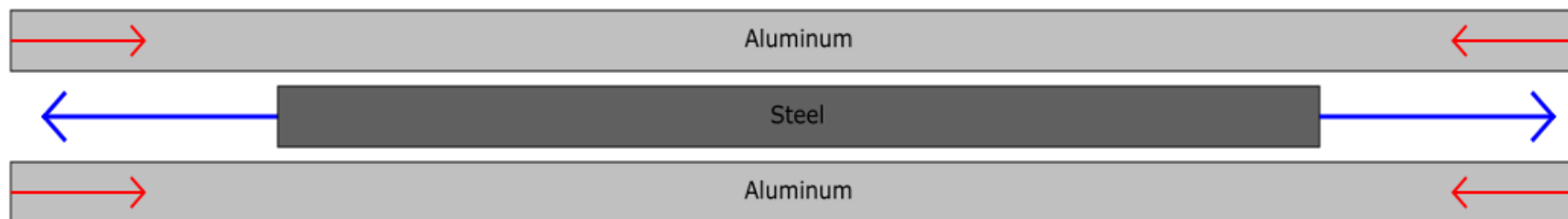
Bird Cage Model



Elongation

AL = 65
ST = 65
Total = 130

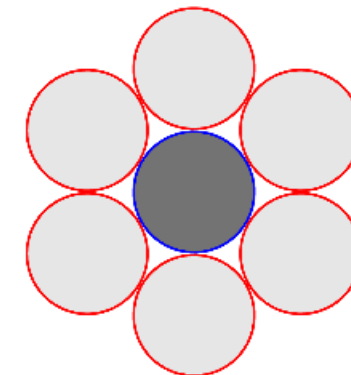
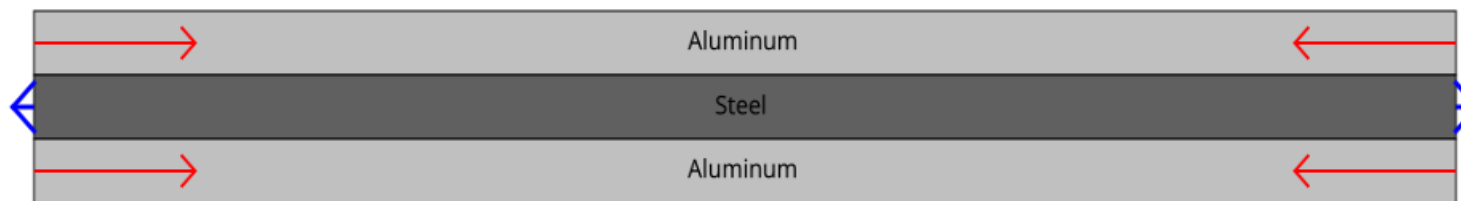
Virtual Compression Model



Elongation

AL = 95
ST = 75
Total = 170

Welded Model



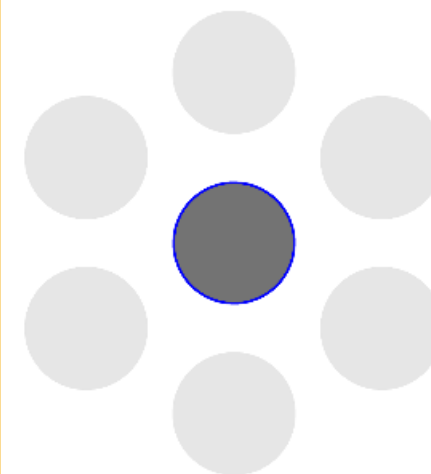
Elongation

AL = 102.5

ST = 102.5

Total = 205

Bird Cage Model



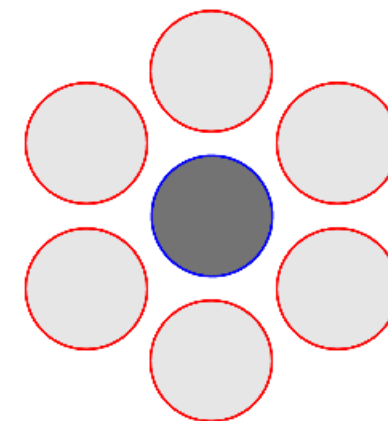
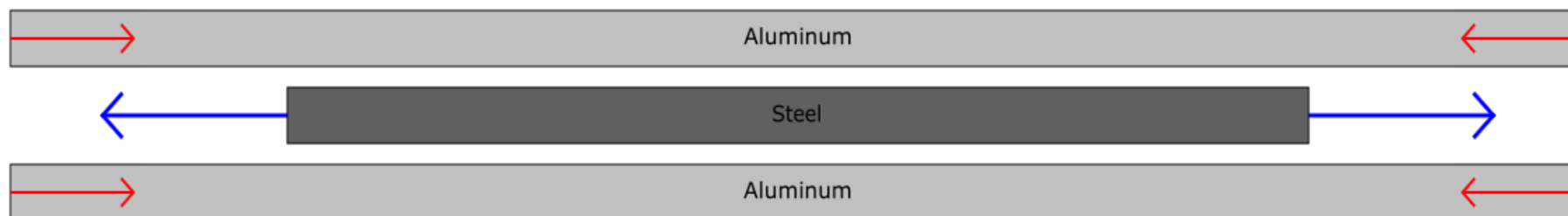
Elongation

AL = 65

ST = 70

Total = 135

Virtual Compression Model



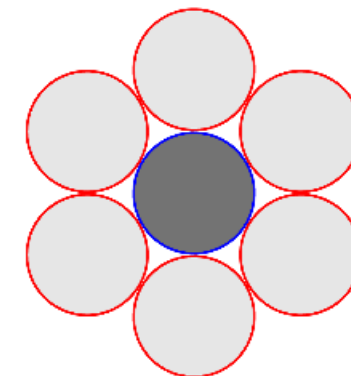
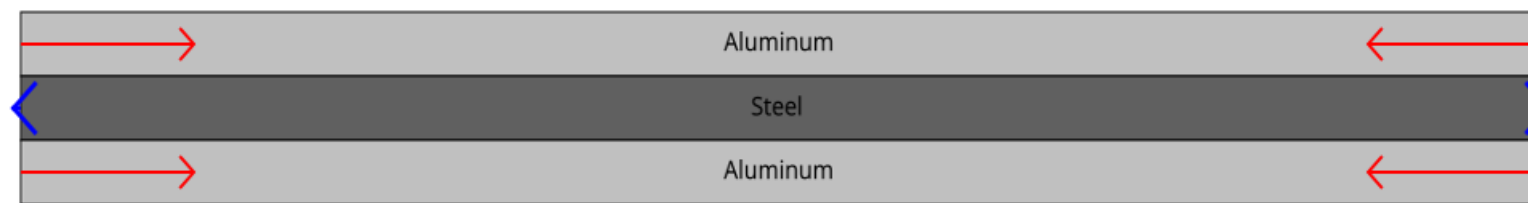
Elongation

AL = 95

ST = 80

Total = 175

Welded Model



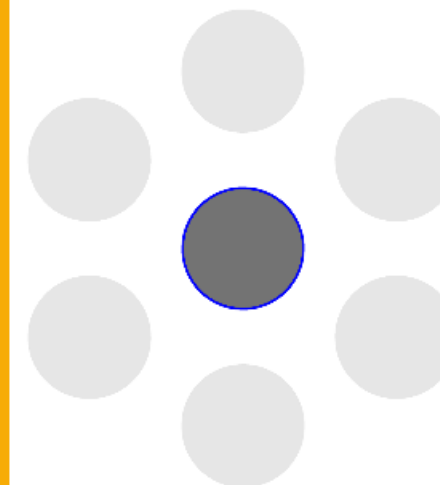
Elongation

AL = 110

ST = 110

Total = 220

Bird Cage Model



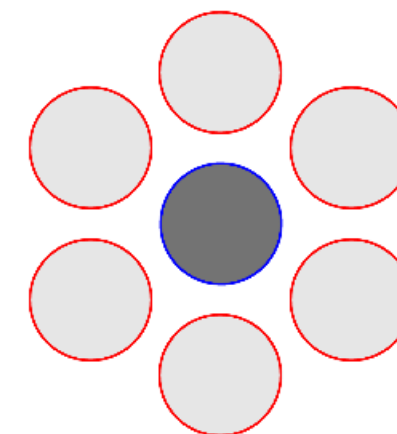
Elongation

AL = 65

ST = 75

Total = 140

Virtual Compression Model



Elongation

AL = 95

ST = 85

Total = 180

Power Line Systems

IT'S ALL ABOUT YOUR POWER LINES

Advanced Sag & Tension

IEC

FAC 008/009

NESC

Materials Management

LiDAR Modeling

Structural Analysis

PLS-CADD

CSA

Pole Analysis

CENELEC

Distribution

Transmission

NERC Ratings

Line Optimization

Project Estimating

Questions?

FAC 003

ASCE

Joint Use

PLS-POLE

GO95

Vegetation Management

1000+ Users in 100+ Countries

Storm Hardening

IEEE

Line Ratings

TOWER

Drafting