



# Hardware



## **SAE Towers designs, tests and manufactures transmission line hardware, offering customers the most complete in-house resource in the Americas for transmission structures and related products and services.**

We design a full range of insulator string components according to our customers' electrical and mechanical requirements, with a special regard for live line maintenance considerations. We utilize in-house ironworks and aluminum casting technology to produce line hardware for conductor and shield wire cable. All hardware design, mechanical testing and manufacturing is done at our plant in Brazil located near Belo Horizonte in Betim, Minas Gerais. For electrical high voltage and high current tests, we have established strategic partnerships with internationally recognized laboratories.

Our hardware product family includes:

- Yokes
- Suspension and Dead End Clamps
- Joint Splices
- Repair Sleeves
- Armor Rods
- String Components
- Corona Rings
- Grounding Connectors

**Each hardware component that we design and manufacture is subjected to rigorous testing.**

RIV, corona and power arc electrical performance tests are conducted when requested on insulator strings. Mechanical tests for rupture, slipping and torque are performed on all components. Years of experience combined with a dedication to quality and state-of-the-art engineering and manufacturing processes ensures that our hardware provides the same long-term reliability as our towers, poles and substation structures.



*Aluminum casting process.*



different customers, different geographies, different cultures. We utilize the latest versions of engineering software. We are able to expertly design transmission hardware for all operating conditions. Our shop drawings are prepared in-house and are integrated with our manufacturing processes.

### **Manufacturing Quality and Capacity**

High levels of output and reliability result from our quality-driven processes at our transmission line hardware manufacturing operation located inside our AISC-compliant plant in Belo Horizonte, Brazil. The site covers 35 acres and features 377,000 square feet of total production space, plus 29,100 square feet of engineering and administrative offices. More than 28,000 square feet are dedicated to our hardware production operation.

**Our plants in the Americas have earned the following certifications:**

- Quality Management Systems - ISO 9001
- Environmental Management Systems ISO 14001
- Occupational Health & Safety Management Systems - OHSAS 18001



**Our in-house staff of engineers has the tools, training and real-world experience to generate hardware designs that consider the full scope and complexity of your project requirements.**

Our engineers understand today's construction methods and design accordingly. They are aware of the field-fitness challenges. They are committed to interactive collaboration and continuous improvement through on-going application of lessons learned. They value the unique requirements of

The plant utilizes aluminum casting equipment, a mechanical milling center, a preform machine, radial drilling equipment, mechanical presses, oxy cutters and semi-automatic hot-dip galvanizing systems including dulling and deglaring tanks. The facility pioneered the application of a unique galvanizing process that utilizes a continuous conveyor to advance the material through a long narrow kettle. Our quality system involves all manufacturing steps from raw material to finished goods and packaging, ensuring product conformity and uniformity according to design specifications.

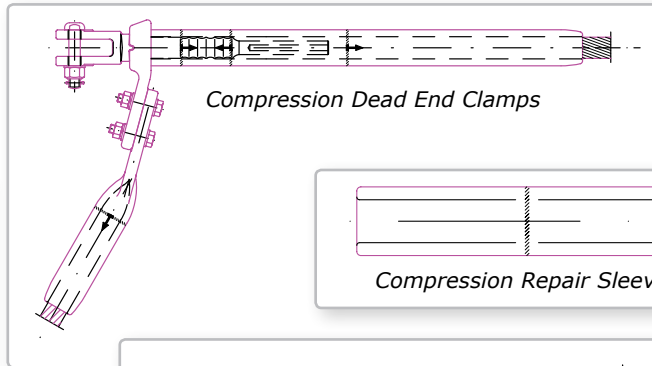
**Quality. Reliability. Timely Delivery.**



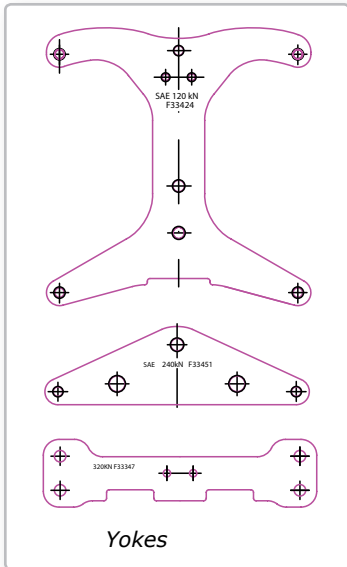
### Transmission Line Hardware



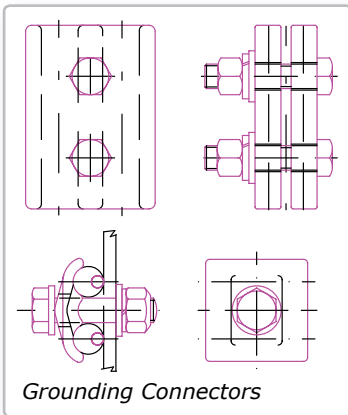
Armor Rods



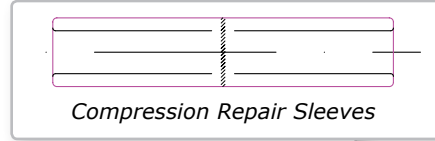
Compression Dead End Clamps



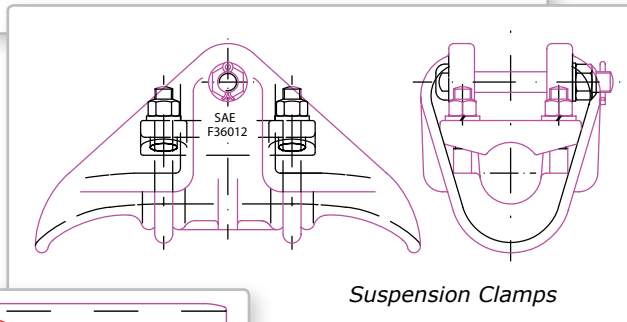
Yokes



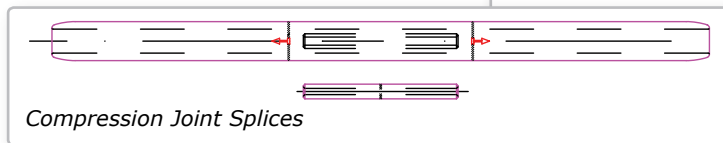
Grounding Connectors



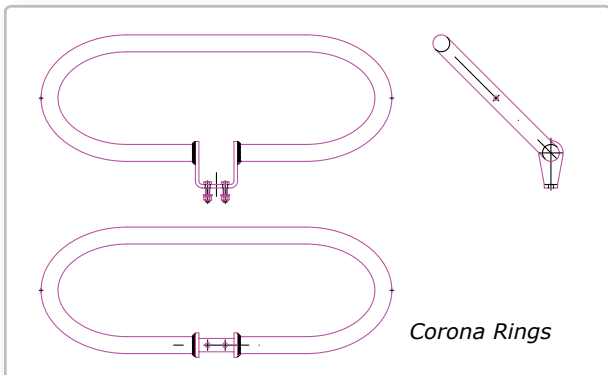
Compression Repair Sleeves



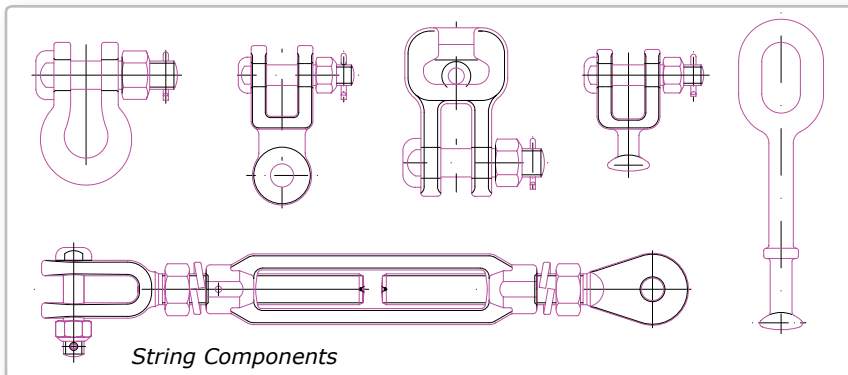
Suspension Clamps



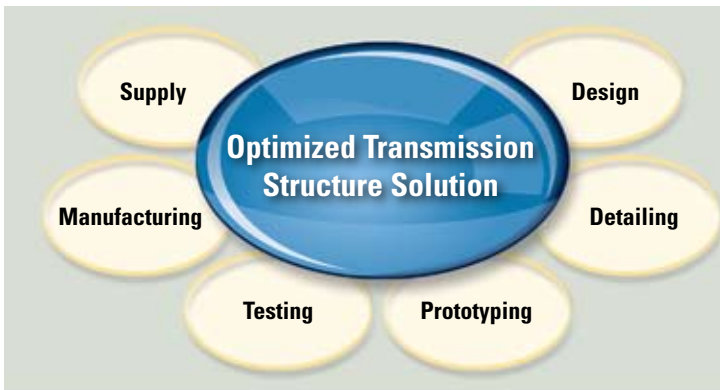
Compression Joint Splices



Corona Rings



String Components



#### SAE Towers

The largest steel lattice producer in the Americas providing Optimized Transmission Structure Solutions through world-class in-house capabilities.

- Field-Fit Constructability
- Cost Effectiveness
- Weight Efficiency
- Shorter/Simpler Transaction Cycles
- Improved Live Line Maintainability
- Long Term Reliability

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