



## Introduction

### General

AFL has led in the development of aluminum conductor accessories since the late 1890s. More than 80 years of continuous research, development and field experience have resulted in AFL's superior accessory products.

### Compression Accessories

AFL has the industry's most complete line of compression accessories—dead ends, jumper terminals, joints, T-taps, repair sleeves and terminal connectors—designed to operate, regardless of the electrical load, at a temperature lower than that of the conductor. (See IEEE paper C72-188-6, "Effect of Elevated Temperature on the performance of Conductor Accessories.") In addition, AFL manufactures a complete line of Alloy Compression accessories. All AFL compression accessories are designed for aerial or ground installation with portable compressors. The above mentioned accessories for a given conductor size use the same aluminum and steel compression die size for both aluminum and steel parts.

### Spacer-Dampers (See Motion Control)

The spacer damper combines the function of a spacer in maintaining conductor separation and controlling oscillation and the function of a damper in controlling aeolian vibration. It frequently provides the most economical approach to protecting multi-conductor bundle systems and is an AFL engineered product.

### Spacers (See Motion Control)

The trend to higher transmission voltages and load currents has brought many changes in line construction, notably the substitution of bundle conductor for single conductor on both AC and DC transmission lines. Spacers are necessary on horizontal bundle construction to prevent damage to subconductors from wind movement, ice unloading and keep subconductors separated when electrical forces tend to force them together.

AFL's work on spacers for bundles EHV lines started in 1954. The first commercial design was the articulated-type spacers which are still giving good service after 30 years in operation.

AFL's research and development led to the introduction of closed-spring type spacers, which have excellent service records on thousands of miles of bundle conductor. Three-bundle and four-bundle spacers were developed as the need arose. Recently, a style of spacer employing elastomer bushings was developed. The Speed-Grip® design provides a firm but cushioned grip on the conductor and allows rapid installation without special tools.

For unusual line construction, special engineering data for spacer applications are available through AFL.

### Vibration Dampers (See Motion Control)

The AFL vibration damper (U.S. Patent 3,052,747) is an energy dissipation device for removing the energy of vibration imparted to a conductor by wind. Conductor vibration induces a relative motion between the clamp and the inertia weights which causes flexure of the steel cable, resulting in dissipation of mechanical energy by friction between the strands of the damper cable. In contrast to most tuned damping devices, which operate best only near their natural frequencies, the AFL vibration damper is designed for efficient transfer and dissipation of energy for the entire spectrum of frequencies that occur on transmission lines. For a detailed discussion see "Panel Discussion on Aeolian Vibration." Part IV, EEI Transmission and Distribution Committee, January 1972.

Vibration protection with AFL is much more than a product. It is a proven engineered system backed by more than 60 years of experience. This technical expertise is available to transmission system engineers in the form of specific, comprehensive computations based on the particular input factors of your system.

*(Continued on next page)*



## Introduction (cont.)

### Parallel Groove Clamps

The geometry of the AFL universal groove represents an engineering achievement: an optimum shape for both electrical and mechanical efficiency for a range of conductor sizes. This groove shape (U.S. Patent 3,100,672) is used for catalog series 390, 480, and 580.

Groove for 390 Series, used for service drops, and 480 Series, used for full load connections, are protected with a film of grease.

Aluminum bolts used in parallel groove clamps have an alumilite 205 finish and a thin coating of inhibitor compound. The hard finish and lubrication reduce thread friction and provide greater clamping force on the conductor for a given torque.

These bolts will not seize. Benefits of aluminum bolts also include equalized expansion and contraction and contraction with temperature changes and favorable modulus of elasticity for "spring follow-up."

### Joint Compounds (See Compounds)

As long ago as the 1800s, it was known that the use of petrolatum improves an electric contact by preventing oxidation on clean metal surfaces. A half century of research and use has demonstrated that for both aluminum and copper, contact surfaces should be coated with a suitable grease-type compound.

### Compressors, Hydraulic (See Tools & Equipment)

Hydraulic compressors are used for applying compression fittings to aluminum conductors and steel and/or alumoweld overhead ground wire. AFL offers the most complete line of portable hydraulic compressors in the industry: 12, 30, 60, 100 and 150 ton.

Accompanying the compressors are portable gasoline and electric oil hydraulic pumps, tailored to rugged field use and offering manual and/or remote control. All pumps and compressors operate at one pressure, 10,000 psi, and have one type of quick coupling system which permits complete interchangeability.

### Comealongs

Comealongs are stringing tools designed for pulling conductors to initial sag tension for dead end installation. AFL comealongs are a highly engineered and tested product. Eyebolts are high strength forged steel. Bails receive both magnaflux and dye check inspection of metal quality. Prior to shipment, a final pulling test is made on every comealong at 125% of its recommended tension limit.