Penstock and Large Diameter Couplings

For large diameter, high-pressure water and industrial pipeline applications

Dresser large diameter penstock couplings consists of the same components of our standard Style 38 couplings with a middle ring, two gaskets and two followers for connecting two pieces of plain-end pipe. To help seal the sleeve against leakage, as bolts and nuts are tightened the followers are drawn together compressing the gaskets against the middle ring sleeve and pipe surface.

Invented in 1891 by Solomon R. Dresser, this proven sealing principle has remained relatively unchanged over the years, although many improvements have been made to meet modern requirements. Initially, couplings were used primarily on buried pipelines. That changed back in 1921 when the first steel-coupled Penstock was constructed by the city of Brigham, Utah.

Penstock Coupling Advantages:

Built-in Flexibiilty - The most essential quality of any successful pipe joint is pressure tightness at all times. To remain tight, the joint must maintain a constant seal under all conditions of pipe movement, including vibration, deflection movements of the pipe, expansion and contraction, leverage action of the pipe on the joint, etc. These forces exert stresses on the pipe and the pipe joint joint, but with Dresser couplings the joint properly flexes in accordance with external forces, and harmful stresses are prevented.

This beneficial flexing occurs with all sleeve-type Dresser couplings. As a result, the penstock or pipeline becomes a series of independent sections that can flex like the vertebrae of a snake; in other words, a Dresser-coupled penstock is a fully articulated penstock.

Reduced Excavation - For example, if the terrain is rock, substantial savings can be realized in construction costs by having the penstock follow the surface to avoid excessive excavation and fabricated bends. A standard coupling, in the larger diameter range, can absorb up to one degree of deflection. On the basis of 40-foot pipe lengths, this means an offset of up to eight inches per section from the vertical or horizontal alignment.

Absorbs Deflection and Stress - Small miscalculations in construction of pipe supports are compensated for by the flexibility of the couplings without shimming or time-consuming adjustment of saddles and girders. There's no need to stress-relieve under difficult field conditions.

Should minor settlement occur after penstock construction, the couplings will absorb the resulting deflection without leakage - and without transmitting harmful stresses to the pipe or supports.

Expansion Joints Not Required - Since each coupling absorbs, without leakage, up to 3/8" axial pipe movement, the usual construction method of leaving a small gap between pipe ends inside the couplings permits relief of expansion-contraction stresses for 40-foot pipe lengths within the widest range of temperatures. Therefore, there is no concentrated pipe movement and no need for conventional expansion joints, which require maintenance.

Provides a Factory-built, 100% Efficient Joint

Each coupling is designed to customer pressure requirements. There is no chance for hidden flaws and no need for field x-rays to prove the joint for field efficiency.

Additional Features of Dresser Large Diameter Couplings

Dresser know-how solves construction problems:

- Dresser has designed couplings for hundreds of penstocks all over the world. We know the design requirements to meet size and pressure and other criteria of individual power projects. For extremes of pressure, we are in a position to advise of various field construction techniques.

- The experience at Dresser in working with different construction materials such as higher strength steels, etc., often permits substantial weight reductions. And the variations in coupling design can be utilized to vary coupling strength to match head requirements on sections of individual penstocks, or on different penstocks with differing pressure requirements - all joints being “factory-tailored” to meet field needs.

Design adaptability and ease of installation:

- The typical coupling design for large-diameter high pressure lines is available with several thicknesses of follower and middle ring sections, depending on the line pressure and diameter required.

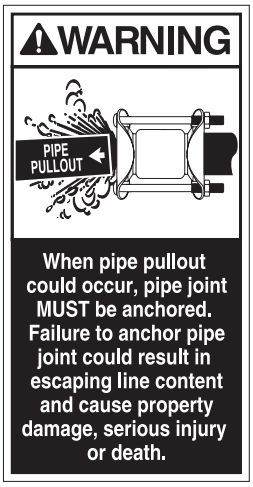
- Placement of the coupling middle ring on one pipe end permits its use as a line-up guide, quickly bringing pipe ends together for joining. You won’t need specialists in the field while waiting for pipes to be placed and lined up.

- Since temperature and moisture do not affect coupling installation, construction personnel can proceed in any weather. Under proper supervision, work crews can assemble penstock couplings quickly and efficiently.

Oversized Penstocks:

Current large coupling fabrication capabilities are up to 108” for ‘full-circle’ ring design. For larger diameter pipelines with custom-built follower and middle ring section requirements, an alternative segmental design can be quoted. The middle ring and followers are fabricated in segments and carefully match-marked and beveled at the factory for field welding into a complete circle.

Segmental followers can also be cast in ductile iron. With a 2-bolt per segment design, the follower segments are provided with a ‘heel’ which rides on the outside surface of the middle ring and prevents rotation of the followers when bolts are fully torqued. The followers are cast to the correct length and radius so when installed around the circumference of the pipe, they provide a full confinement and 360-degree sealing of the gaskets.



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