

DOGBONE RETROFIT PROJECTS

La Favorite is proud to offer its expertise in facilitating the replacement of fatigued metal turbine to condenser expansion joints with Dogbone Expansion Joint metal frame and rubber element.

With many older plants looking for cost effective solutions for many aspects of their operation, the expense of buying, fitting up and welding stainless steel expansion joints is one area costs can be reduced.

The hardware for the Dogbone Expansion Joint is relatively simple to install. Once properly welded in place it becomes a permanent fixture. Future maintenance involves replacement of the rubber expansion joint itself which is significantly quicker and requires much less technical "know how".

The rubber Dogbone Expansion Joint is a proven performer for over 50 years of application in both the Nuclear and Fossil power generation industries. Modern upgrades, as spelled out in this pamphlet, have resulted in high reliability and performance rates unmatched by any other expansion joint.

Let La Favorite help solve your condenser inlet problems through proven manufacturing techniques, sound installation advice and superior field splicing service.



THE LA FAVORITE EXPERIENCE

In today's highly competitive and ever changing power generation market La Favorite prides itself on being able to offer our customers a dynamic service of direct industrial rubber product manufacture and supply and comprehensive field inspection and service expertise. These, combined with part and service warranties as well as ongoing technical support has allowed La Favorite to support their customers from outage pre planning through full operations.



The Dogbone Expansion Joint

For over 50 years La Favorite Industries and its predecessors have been supplying the steam power electrical industry with the most reliable Dogbone Expansion joints, utilizing the highest quality materials available. We currently offer multiple sizes of Dogbones to support all of our customer's needs. Our extensive production knowledge combined with our hands on field experience allows us to offer a comprehensive package of product, service and support to our customers. We can guarantee consistency and quality of both material and process in production since we are the manufacturer. Because of this, 20 year service lives for our Dogbones are not an unusual occurrence.

Dogbone Expansion Joints operate in a nearly full vacuum environment which generates a force load of approximately 1400 lbs per square foot of surface area. High quality fabric, cover and bulb reinforcement materials play crucial roles in maintaining structural integrity, insuring reliability and reducing chances of catastrophic failure.



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THE EVOLUTION OF DOGBONE CONSTRUCTION MATERIALS

In the 60+ years that Dogbone Expansion Joints have been in service in the power generation industry, numerous rubber compounds, bulb core and fabric reinforcement materials have been utilized in the construction. In the last 30 years La Favorite has worked hard to ensure that the best possible product is offered to our customers. Staying in touch with the power generation industry has allowed us to learn the challenges they face and how we could utilize industrial material improvements to increase quality and reliability.

The original Dogbone Expansion Joints of the 1950's were constructed with cotton duck fabric reinforcement. Since this time synthetic materials have been incorporated to offer greater reliability and strength. Rayon and Polyester were the earliest choices due to their improved strength and light weight. After years of case studies throughout the industry that involved polyester use, La Favorite began investigating an upgrade in fabric materials to offer greater reliability in service. Nylon offers increased strength, greater flexibility, better work-ability in regards to construction and splicing and resistance to wicking of liquids that it may come into contact with should the rubber cover become compromised.

Cover materials have varied greatly over the years. Natural rubber, chlorobutyl, Neoprene and more recently EPDM have all been tried. EPDM has higher heat resistance, but unless combined with an equally heat resistant fabric, provides no additional protection. EPDM has also shown inherent problems in regards to its lack of oil resistance. Specifically, turbine bearing oil has been found to cause such degradation of EPDM covers as to have caused failures. Therefore, EPDM as far as we are concerned, has very limited application in Dogbones and should only be used in very specific or unusual circumstances. With many bearing oil caused failures, La Favorite reached the conclusion many years ago that Neoprene's inherent oil resistance as well as good heat resistance and superior bonding is the best overall material for this product.

"It's JUST a splice..." **UNTIL IT FAILS**, then it becomes a multi-million dollar disaster...

SPLICING SERVICES

La Favorite Ind. regards the splicing process as an extension of the manufacturing process and is the final step in the production of a Dogbone expansion joint. La Favorite field splices are as strong as the expansion joint itself, using a method that insures continuity and long life. The same quality materials used to manufacture the expansion joint in the factory are used to make the field splice inside the condenser.

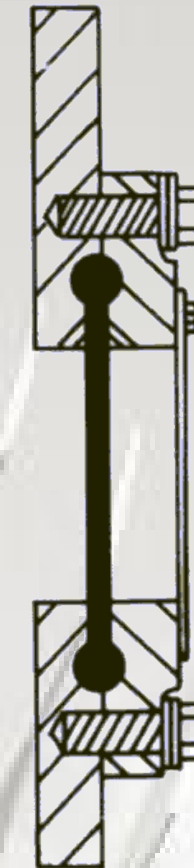
La Favorite technicians are readily available for splicing and installation expertise, relating to Dogbone expansion joints. In addition, we can assist in planning the installation and through our years of experience can recognize common deficiencies in the condenser; such as misalignment and settling, that can lead to premature failure of the expansion joint, if not corrected or compensated for.

CONDENSER EXPANSION JOINT TURNKEY SOLUTIONS

La Favorite offers complete installation of Dogbone expansion joints. Our experienced team specializes in these types of joints and provides cost effective solutions while maintaining exceptional quality. Attention to detail, such as surface preparation, thread cleaning and final torquing are the perfect companion to our products and splicing services. It provides one stop shopping and a single warranty for the product, splicing and installation. Our organized and motivated work crews eliminate the worry that comes with such a non-routine activity. If you are lacking trained manpower, let us take care of it for you

DOGBONE CONSTRUCTION MATERIAL

COVER
HIGH GRADE DUPONT NEOPRENE CUSTOM BLENDED TO LA FAVORITES OWN SPECIFIC RECIPE
FABRIC REINFORCEMENT
13oz NYLON FILAMENT YARN COATED IN NEOPRENE/NITRILE COMPOUND.
BULB REINFORCEMENT
NATURAL FIBER SISAL ROPE



TYPICAL CLAMPING SYSTEM LAYOUT

A DOGBONE BY IT'S PARTS

Cover Material

Although cover materials can be adaptable for very specific applications, Neoprene remains the best overall cover material. Inherently heat and flame resistant, this versatile material possesses excellent chemical resistance. A very common problem among aged units is bearing oil leaking from turbine bearing units which has no adverse effect at all on the Neoprene cover.

Fabric Reinforcement

La Favorite Industries utilizes a high tensile strength nylon fabric to reinforce its Dogbone Expansion Joints. The nylon is impregnated with a synthetic rubber compound and constructed in a 6 or 8 ply matrix (depending on the dimensions of the Expansion Joint) which promotes superior adhesion and strength. Nylon has shown itself to be superior in its ability to resist breakdown from pinching of poorly designed clamps, water incursion, and direct steam impingement due to failed or missing steam shields.

Bulb Core

This portion of the Dogbone Expansion Joint is one of the most critical in regards to design and construction. Its inclusion provides greater resistance to the clamping forces and helps prevent extrusion or migration of the rubber and ensures that the bulb as a whole remains seated in the seal groove under the operational load.

Dogbone Sizes Available

6" O/A Width x 1/2" Web (1 3/8" bulb dia.)

9" O/A Width x 5/8" Web

9 3/8" O/A Width x 1/2" Web*

9 3/4" O/A Width x 1/2" Web*

10" O/A Width x 3/8" Web*

10" O/A Width x 5/8" Web*

10 1/4" O/A Width x 5/8" Web

10 1/2" O/A Width x 3/8" Web

10 5/8" O/A Width x 3/8" Web

10 5/8" O/A Width x 5/8" Web

* Standard OEM Sizes

Custom sizes available if required

