CYCLE LIFE • TESTING

CYCLE LIFE

The cycle life expectancy of an Expansion Joint is affected by various factors such as: (a) operating pressure, (b) operating temperature, (c) the material from which the bellows is made, (d) the movement per convolution, (e) the thickness of the bellows, (f) the convolution, pitch, (g) depth and shape of the convolution and (h) bellows heat treatment. Any change in these factors will result in a change in the life of the Expansion Joint. The work hardening of austenitic stainless steel, induced during the forming of convolutions, generally improves the fatigue life of an Expansion Joint, often to a marked degree; thus, it is not normally considered beneficial to heat treat. The necessity for heat treatment of other materials should be considered individually

The life expectancy can be defined as the total number of complete cycles which can be expected from the Expansion Joint based on data tabulated from tests performed at room temperature under simulated operating conditions. A cycle can be defined as one complete movement of an Expansion Joint from initial to extreme position and return.

Expansion Joints can be specially designed for very high cyclic life. However, when this is required, the Expansion Joint manufacturer must be advised of the estimated number of cycles required.

Cycle life is dependent upon the maximum range of stress to which the bellows is subjected, the maximum stress amplitude being a far less significant factor. Accordingly, in most cases, cold springing an expansion joint in order to reduce the maximum stress amplitude would not result in a significant improvement in cycle life.

PRODUCTION TESTING

It is standard practice for Anaconda to test production assemblies. Test pressure and/or dye penetrant inspection is determined by size and configuration. Hydrostatic testing to 1.5 times working pressure as well as vacuum testing is also employed when specified.