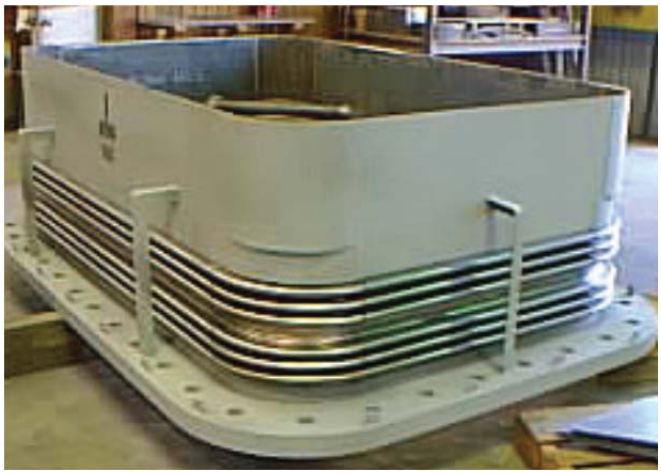
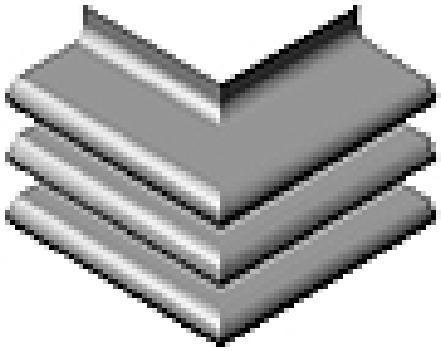
Metallic Expansion Joint

7. Rectangular Metallic Expansion Joint (PEM-RE)

The rectangular metallic expansion joints have a variety of applications in the power, petrochemical, refining, chemical, and steel industries. Every rectangular metallic expansion joint is custom-designed to absorb the thermal movements of the system in which it is installed.
The rectangular metallic expansion joints absorb three types of movement(axial, lateral and angular) as like circular expansion joints. For the purpose of designing rectangular bellows, it is critical to know in which direction the lateral and angular movements will occur, i.e. parallel to the long and/or short side of the bellows. Unlike circular bellows where the pressure stress is a circumferential membrane (hoop) stress, the rectangular bellows must be designed for longitudinal (beam) bending stresses.
Mainly, there are two types of convolution profiles, V profile and U profile. The V convolution profile must be constructed with single miter corners, unless otherwise specified. Round corner bellows will always be constructed using the U convolution profile. The corner construction details are shown below.

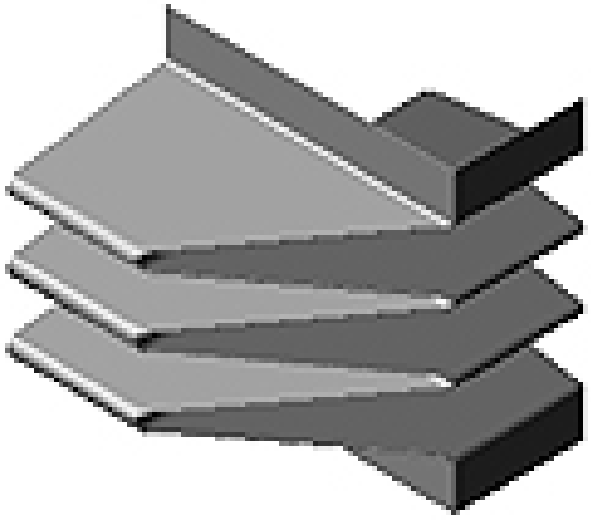


Round Corner - or best fatigue performance and best value. **Rounded Corners U Profile Should** be considered in applications up to 30 psig, and where vibration and cycle life are important factors. Rounded corners are the most expensive to manufacture. This design results in the lowest corner stress if fit up and welding of the corner seams are carefully controlled.



Single Miter Corner - conventional design.
Single Miter V Profile is the most common and economical type used to compensate for thermal expansion and can readily be bolted or welded into the connecting duct work. These are preferred in low cycle and vibration-free applications.

Double Miter Corner - value added - low corner fatigue
Double Miter V profile is slightly more expensive to manufacture than the single miter design. However, they do provide a greater cycle life under the same set of operating conditions.



Camera Corner - not recommended
Camera Corners V Profile is used mainly on low-pressure application.