

Jacket –vs- Plating/Coating

There are two types of soft outer layers that can be applied to metal seals to improve leakage performance. In both cases, the substrate must provide enough specific load to plastically deform the soft outer layer into the flange imperfections.

Wrapped Jacket The Helicoflex Spring Energized Seal has a soft outer jacket that consists of a metal strip that has been wrapped or formed around the spring. Typically it is much thicker than platings or coatings. For example, a Silver jacket is approximately .012” to .020” thick where Silver plating is approximately .001” to .002” thick.

There are two primary advantages of the wrapped jacket. First, there is greater flexibility in material choice since the jacket is not limited by available plating technology. The Helicoflex seal can be made with most metals available in strip or sheet form which helps match the seal material to temperature and corrosion requirements. Secondly, because the jacket is thicker, it typically performs better on rougher surface finishes. This is especially helpful for older vessels, such as aging nuclear reactor pressure vessels, where the grooves may have been polished or refinished.

The Helicoflex seal spring is specifically designed for each jacket material to ensure plastic deformation is achieved.

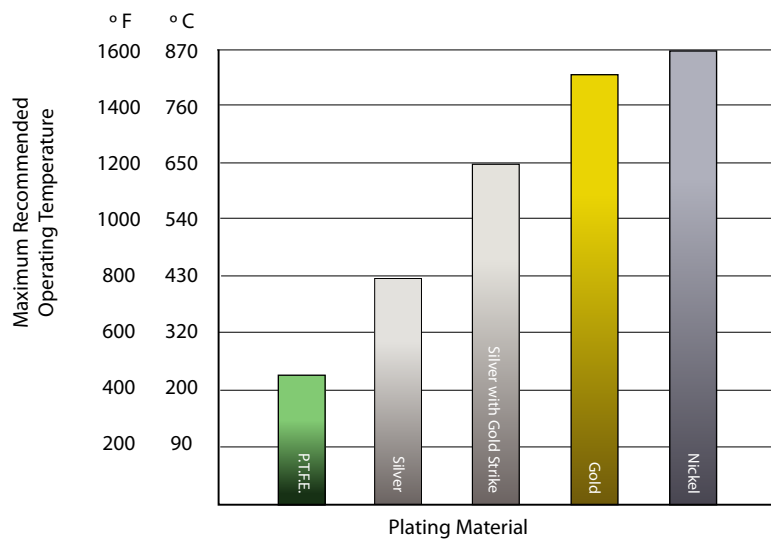
Platings/Coatings Platings and coatings are applied directly to the seal substrate. Typically these treatments are very thin and are usually .001/.002” thick. Therefore, they require a smooth groove/flange finish for optimal performance. Platings such as Silver and Nickel are applied by an electroplating process while coatings such as PTFE are typically applied by a spray or dip process. It is more difficult to match materials to temperature and corrosion requirements because platings and coatings are limited in choice by available deposition technologies.

It is important to note that each plating material requires a minimum amount of specific load to plastically deform. Below are some guidelines for Silver plated non-spring energized seals.

Cross sections: 0.063 to 0.156 = minimum load of 400 lbs per inch of circumference.

Cross sections: 0.188 to 0.250 = minimum load of 800 lbs per inch of circumference.

Maximum Recommended Operating Temperatures for Platings and Coatings



Contact Applications Engineering for additional platings and coatings.