



## Bal Seal® spring-energized low friction seals in gimbals/pods/turrets/pan-tilt systems

Application Bulletin

PN-400-1 (Rev. 01, 08-18-17)

19650 Pauling  
Foothill Ranch, CA  
USA 92610-2610

t +1 949 460 2100  
f +1 949 460 2300

Jollemanhof 16, 5th floor  
1019 GW Amsterdam  
The Netherlands

t +31 20 638 6523  
f +31 20 625 6018

Suite 901, Chinachem  
Century Tower  
178 Gloucester Road,  
Wanchai, Hong Kong

t +852 28681860  
f +852 22956753

[www.balseal.com](http://www.balseal.com)



## Overview

Design engineers employ gimbals, pods, turrets, and pan-tilt systems to protect sensitive electronics used for infrared scanning, radar detection, and weapons targeting. These systems, which are deployed in air, land, and sea-based equipment, are usually controlled by small motors designed to meet strict weight and power specifications. Many of these systems use one or more seals to insulate their contents from environmental conditions including moisture, pressures, high and low temperatures, dust, and debris.

The environmental seal, which is installed between two mating surfaces, must maintain sufficient contact pressure to keep internal components clean and dry. However, if the seal configuration creates too much friction, motor performance, precision, and system life can be compromised.

The Bal Seal® spring-energized low friction seal offers an ideal solution for gimbals, pods, turrets, and pan-tilt systems used on aircraft and other platforms. Its seal jacket is typically constructed of specially formulated polymer-filled polytetrafluoroethylene (PTFE) materials that provide exceptional sealing performance and an extremely low dynamic coefficient of friction. Additionally, its Bal Spring® canted coil spring energizer exerts a customizable, near-constant force that helps compensate for wear and ensures long service life.



Rotating electro-optical turret

## Operating Parameters

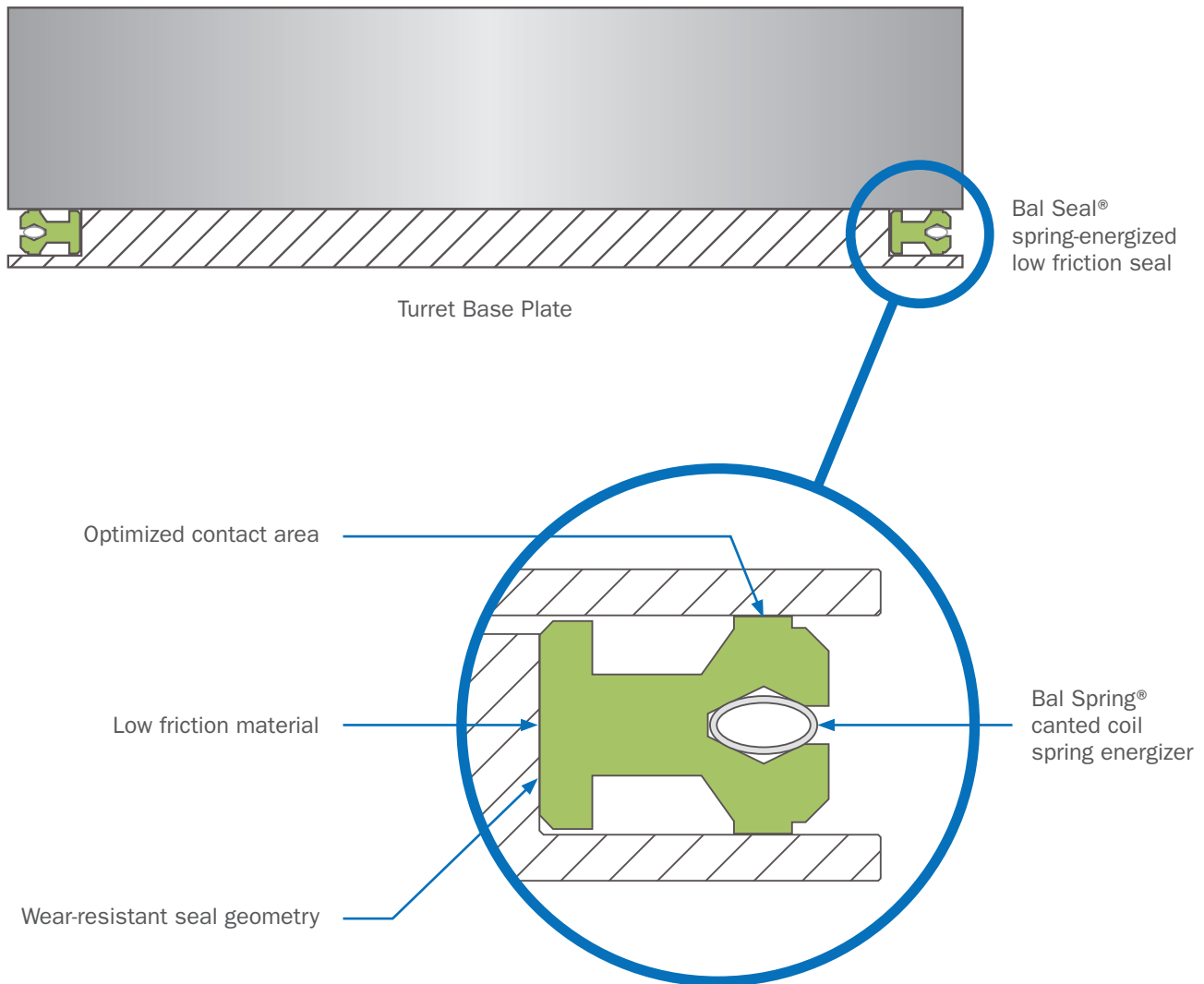
The Bal Seal® low friction seal is designed to deliver effective sealing with minimal friction in oscillating or continuous rotation service. It performs well in temperatures ranging from -60 °C to +80 °C, and in dry or moist environments. Seal materials are compatible with a variety of harsh chemicals (i.e., jet fuels, solvents, Skydrol), and their inherent lubricity eliminates the need for greases and oils.

Bal Seal low friction spring-energized seals are compatible with relatively soft metals, such as uncoated stainless steel. They can be customized to meet specific sealing, frictional and life requirements.

## Advantages

- Materials offer extremely low dynamic coefficient of friction
- Seal can be customized to meet specific friction and leak rate requirements at varied temperatures and pressures
- Allows for required sealing without sacrificing low torque
- Can be used against range of materials (hardness/finishes)
- Design minimizes countersurface wear
- Low friction and stiction—ideal for oscillating motion
- Tolerance stackup benefits—can handle relatively large tolerances compared to seal cross-section

For more information about this sealing solution or material, please contact a Bal Seal Engineering technical sales representative.



The information, descriptions, recommendations and opinions set forth herein are offered solely for your consideration, inquiry, and verification and are not, in part or in whole, to be construed as constituting a warranty, expressed or implied, nor shall they form or be a part of the basis of any bargain with Bal Seal Engineering, Inc.. If any sample or model was shown to or provided by Buyer/User, such sample or model was used merely to illustrate the general description and type of goods. Such use is not to be construed as a warranty that the goods will conform to the sample or model. Furthermore, THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL OTHER WARRANTIES, IMPLIED OR EXPRESSED, ARE EXCLUDED AND SHALL NOT APPLY. This document provides product options for further investigation by Buyers/Users having technical expertise. The Buyer/User, through its own analysis and testing, is solely responsible for making the final selection of the products and for assuming that all performance, safety and warning requirements for the application are met. It is recommended that Buyers/Users run evaluation testing under actual service conditions to determine whether proposed Bal Seal Engineering products are suitable for the intended purpose. Nothing contained herein or in any of our literature shall be considered a license or recommendation for any use that may infringe patent rights. (LE-17)

©Copyright 2017 Bal Seal Engineering, Inc. U.S.A.