USE OF NON-FERROUS METALS IN CONTACT WITH BAL SEAL® SPRING-ENERGIZED SEALS IN DYNAMIC SERVICE

Technical Report
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1.0 DISCUSSION

The type of material with which the seal comes in contact substantially affects the performance of BAL™ Seals. Non-ferrous materials are generally softer than heat treated steel materials and there will be a greater tendency for the BAL Seal to wear and in turn may abrade the metal surface coming in contact with the seal.

2.0 CONSIDERATION ON THE SELECTION OF METALLIC MATERIALS IN CONTACT WITH BAL™ SEALS DYNAMICALLY

The selection of the material in contact with the BAL Seals will depend on the following factors: cost, chemical compatibility, weight, and desirable mechanical properties. Generally, one feature will override the others.

MATERIAL	AVERAGE EQUIVALENT HARDNESS ROCKWELL C	CORROSION RESISTANCE	ABRASION TO BAL SEAL
Aluminum (Hard Anodize)	62	Low	High
Bronze	20 (approx.)	Good	Low
Brass	18 (free cutting)	Medium	Medium
Monel K500	26	Medium	Medium
Hastelloy C-276	41 (cold worked)	Good	High

3.0 MATERIAL SURFACE HARDNESS AND ITS EFFECT ON SEAL PERFORMANCE

In general, the harder the material with which the seal comes in contact, the lower the adhesion between the seal and the sealing surface and the lower the friction, which results in lower wear. BAL Seal Engineering has seals that are designed for use in contact with soft materials. Hard anodizing, plating, and other processes may increase certain materials' surface hardness.

3.0 LUBRICATION AND WEAR

Lubrication, either wet or dry, tends to reduce the adhesion and coefficient of friction between two surfaces, which results in lower wear. In general, wet lubricants are superior to dry lubricants. However, dry lubricants have many advantages. Whenever possible, lubrication – wet or dry – should be used.

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