

# Defender<sup>®</sup> Seals

## ENHANCED DESIGN FOR SUPERIOR MOTOR PROTECTION AND EXTENDED RUN LIFE

### STANDARD AND OPTIONAL MATERIALS

Component	Standard Materials	Optional Materials
Head/Base	Carbon Steel AISI 1045/1035	Stainless Steel 410/416
Housing	Carbon Steel C45 DOM Tube	Stainless Steel 9Cr1Mo/13Cr
Shaft	MONEL <sup>®</sup> K500/UNS N05500	Inconel <sup>®</sup> 718/UNS N07718
Shaft Key/Retaining Ring	Inconel <sup>®</sup> 718/UNS N007718	Inconel <sup>®</sup> 718/UNS N07718
Head Bearing	Bronze	Tungsten Carbide
Bladder	Aflas <sup>®</sup>	HSN
Mechanical Seal	Silicon Carbide/ Silicon Carbide	MONEL <sup>®</sup> Hardware/ Tungsten Carbide/ Tungsten Carbide Face
Guide	Carbon Steel AISI 1045/1035	Stainless Steel 410/416
Thrust Runner	Carbon Steel 4130/4145	Carbon Steel 4130/4145
Thrust Bearing	Carbon Steel Base Bronze Deflection Pad	Carbon Steel Base PeekThrust Face
Guide Tubes	Carbon Steel AISI 1045/1035	Carbon Steel AISI 1045/1035
Fill & Vent Plugs	Carbon Steel AISI 1045/1035	MONEL <sup>®</sup> R405/UNS N04405

Standard and optional materials continued on next page ...



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## STANDARD AND OPTIONAL MATERIALS (CONTINUED)

Component	Standard Materials	Optional Materials
Bag Clamp	Stainless Steel 304 UNS S30400	Stainless Steel 304 UNS S30400
Guide/Base Bearing	Bronze	Tungsten Carbide
O-Ring	EPDM	Aflas®
Shipping Cap	Cast Iron F11701	Cast Iron F11701

Features	Benefits
Super sand seal	Increases run time in abrasive environments
Multiple ultra-high load thrust bearing options	Extends run life through handling high thrust and temperature conditions
High specification options for elastomers including HSN, Viton®, and Aflas®	Improves performance with chemical and temperature resistance
Multiple and flexible series configurations	Enables adaptation to other manufacturer equipment
State-of-the-art mechanical seals	Enhances reliability through employment of advanced design
Optimized bladder design	Strengthens protection against well fluid migration into motors
Multiple bag and labyrinth configurations	Provides system designed to match wellbore conditions to motor size
Extreme environment and AR options	Ensures greater life with optional AR trim packages

## SYSTEM BENEFITS

- » Specially designed high-capacity expansion chambers reduce motor oil loss due to downhole thermal cycling
- » Premium ultra-high load thrust bearings in both unidirectional and bidirectional configurations increase run life
- » Ability to customize and maximize run life performance with tungsten carbide bearing options and premium mechanical seals

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