
HELICOFLEX[®] TEXEAL[®]

HIGH PERFORMANCE SEAL SOLUTIONS

PRESENTATION NOTES

TECHNETICS GROUP

SEALS AND SEALING SYSTEMS

- High-performance
- Customized
- Innovative

MATERIALS & SOLUTIONS

- Diverse materials: metallic, graphite, elastomer
- Static & dynamic

CRITICAL APPLICATIONS

- Temperature: cryogenic to 800°C
- Pressure: ultra vacuum to 3000 bar
- Media: all
- Sealing level: up to 10⁻¹² Pa. m³.s⁻¹



MAESTRAL[®] LABORATORY

UNIQUE PARTNERSHIP CEA/TECHNETICS

- For over 50 years
- At the origin of the development of the HELICOFLEX[®] seal for the Eurodif plant
- Shared patent portfolio
- Synergy: team & resources

MULTI-SCALE SCIENTIFIC APPROACH

DEVELOPMENT OF NEW SEALING SOLUTIONS

FINITE ELEMENTS ANALYSIS (FEA), CHARACTERIZATION & QUALIFICATION TEST



HELICOFLEX® TEXEAL®

HELICOFLEX® TEXEAL® OFFERS

Superior sealing performance

- Improved sealing
- Better resistance to pressure and temperature conditions

Assembly optimization at the design phase:

- Reduced required load

Reduced overall maintenance costs:

- Extended time between maintenance operations
- Reduced maintenance volume during unit shutdowns



HELICOFLEX®

MAIN CHARACTERISTICS

- Highest sealing level performance on the market, up to 1.10-12 Pa.m³.s⁻¹
- Very important spring back
- Excellent corrosion resistance
- Wide range of materials: from standard to specific
- Extended lifetime (up to 100 years)
- Ø 4 to 8000 mm
- Ø 1,5 to 40 mm cross-section
- Adaptable to the application : shaped and circular seals



WHAT IS THE TEXEAL® CONCEPT?

TEXEAL® IS A TEXTURIZATION PROCESS APPLIED TO THE HELICOFLEX® SEALING SURFACE

- Done by Laser technology
- Applicable on different materials
- Respects the physical and chemical properties of the materials
- Optimizes the contact pressures of the sealing surface

ADVANTAGES

- Reduce the load required to compress the seal
- Improved sealing performance

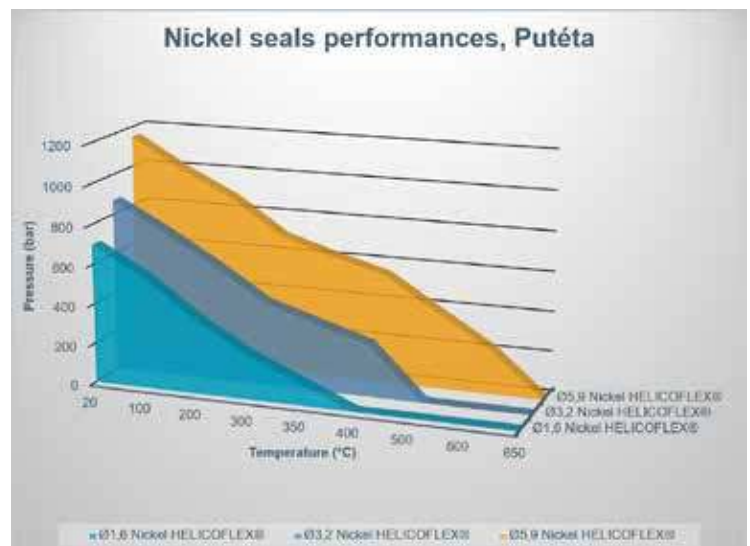


HELICOFLEX® TEXEAL® CONCEPT

KEY ADVANTAGES

- High capacity to withstand service conditions (pressure & temperature) due to material of the sealing surface (nickel*)
- Extended lifetime
- Very good resistance to corrosion

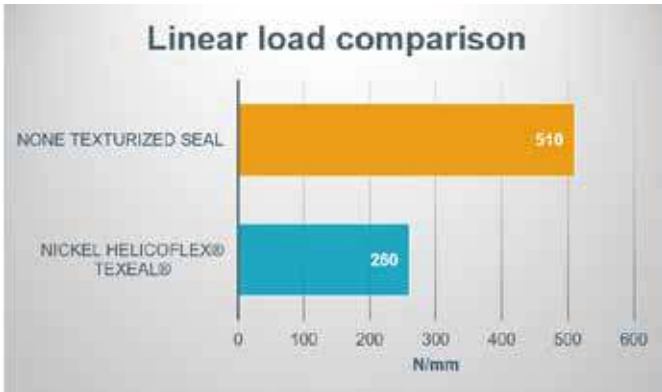
* Nickel has been selected as the preferred material for texturization



HELICOFLEX® TEXEAL® CONCEPT

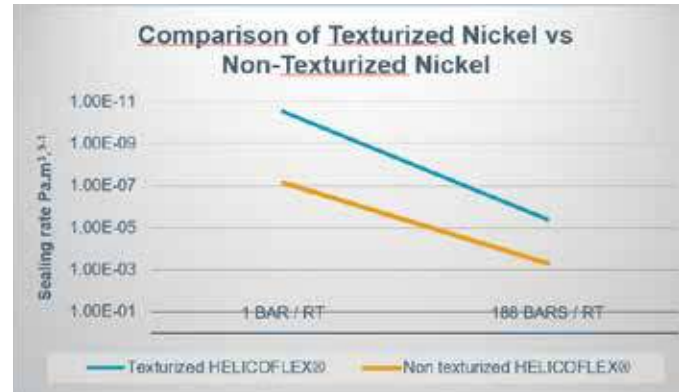
KEY ADVANTAGES

Lower required load with optimal sealing



Example with a 3.2 mm torus nickel HELICOFLEX® seal

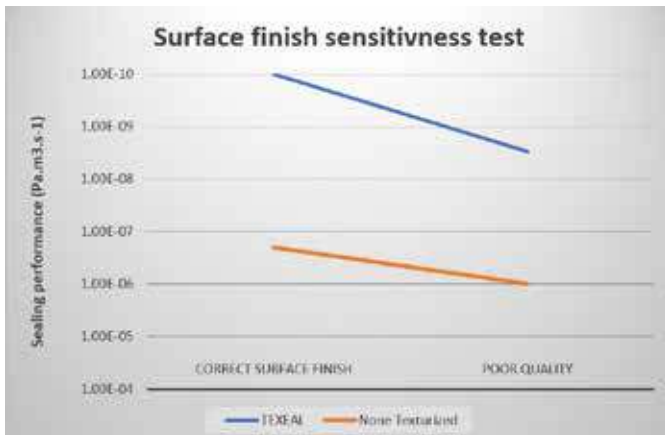
Better sealing performance



HELICOFLEX® TEXEAL® CONCEPT

KEY ADVANTAGES

Lower sensitivity to surface defects

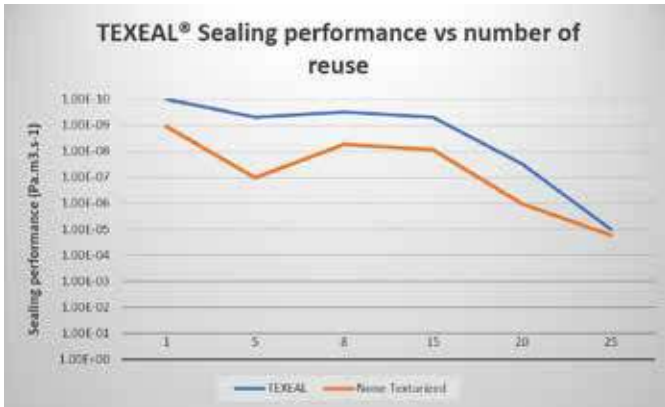


* Scratches 50µm deep

HELICOFLEX® TEXEAL® CONCEPT

KEY ADVANTAGES

Reusability



* Test Helium @ 1bar and 20°C

HELICOFLEX® TEXEAL®

FOCUS ON TWO MARKETS

Nuclear Industry



Semiconductor Industry



HELICOFLEX® TEXEAL®

NUCLEAR INDUSTRY (PWR'S, BWR'S, SMR'S)

HELICOFLEX® TEXEAL® = Silver free seal

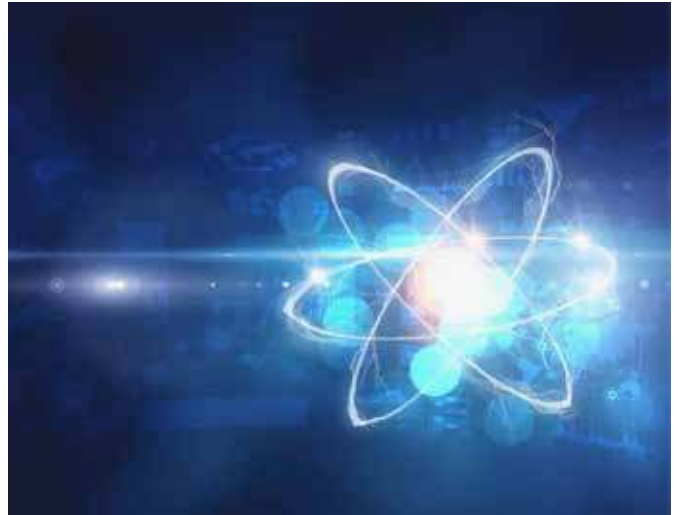
- Removal of silver from the primary circuit

Alternative to graphite gaskets

- Better sealing performance
- Lower tightening load
- Optimization of machining and maintenance costs

Global benefits

- Reduce radiation exposure during maintenance phases
- Reduce operating costs
- Contributes to maintaining nuclear safety



HELICOFLEX® TEXEAL®

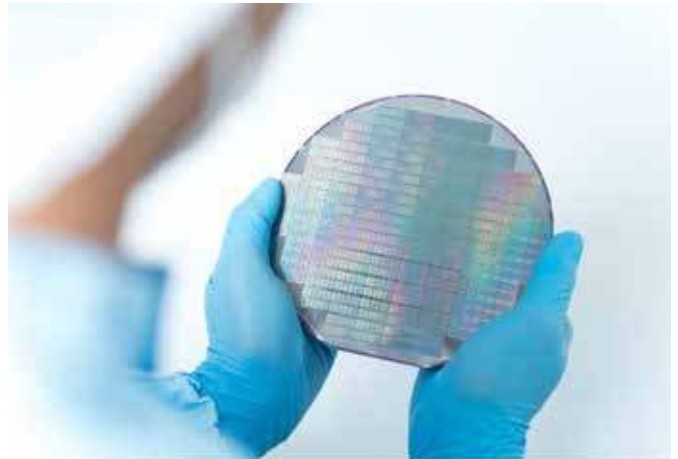
SEMICONDUCTOR INDUSTRY

HELICOFLEX® TEXEAL® = Replacement of elastomeric seals

- No permeation, no outgassing
- Better corrosion resistance
- Higher sealing performance
- Temperature resistance up to 500°C

Global Benefits

- Assembly optimization
- Improved working conditions
- Possibility of seal reuse



HELICOFLEX® TEXEAL®

POSSIBLE APPLICATIONS IN OTHER MARKETS

Hydrogen



Life Sciences

