fluorseals

engineering smart polymers

OIL & GAS INDUSTRY

About fluorseals

fluorseals is a leader in providing state-of-the-art sealing solutions for the Oil & Gas sector.
Thanks to our experience and expertise, we are able to create and accurately test seals and system designs to meet the demanding safety and performance needs of the Oil & Gas industry.

Our vertical integration and full production control provide Oil & Gas customers the benefits of:

Diverse Product Range. fluorseals provides solutions of the highest quality, improved chemical resistance, and excellent, durable mechanical properties, making PTFE and PEEK the most conducive options available for Petrochemical and Oil & Gas applications.

Advanced Engineering. Using Finite Element Analysis software, fluorseals is able to accurately and quickly approve or identify improvements to seals and system designs, guaranteeing an end product that is high-performing, safe, and durable under normal operating conditions.

Expertise in Materials. Our proprietary fluteck™ series materials meet the highest safety and performance standards of the Oil & Gas sector, ensuring safe working conditions, a reduction in product maintenance, a long product lifespan, and complete prevention of highly polluting and corrosive liquid leakage, therefore adhering to current legislation governing environmental protection.

Industry Certifications. fluorseals complies with the high standards and international regulations of the Oil & Gas industry, holding the Norsok and API 6A certifications for its PTFE and PEEK materials.

Why fluorseals?

- Diversity of product offering
- Extensive application and engineering expertise
- Compliance with international industry standards
- Complete product traceability
- Computer-aided product development: Finite Element Analysis (FEA) and verification through laboratory testing

O&G Industry Overview

The Oil and Gas industry requires products of quality and high strength, to ensure operational safety and reduction in maintenance in high pressure applications. With our fluteck™ you can count on safe working conditions, a longer duration in time and if properly assembled leads to total reduction of leakage of highly polluting and corrosive liquids; this also translates into environmental protection.

INDUSTRY CHALLENGE:

Reliable materials in fluid handling to improve operating safety and reduce maintenance costs.

DESIGNED FOR:

Equipment being used in critical applications and high pressure. Harsh environment; extreme conditions in specific geographic and climatic regions (hot summers and the cold winters).

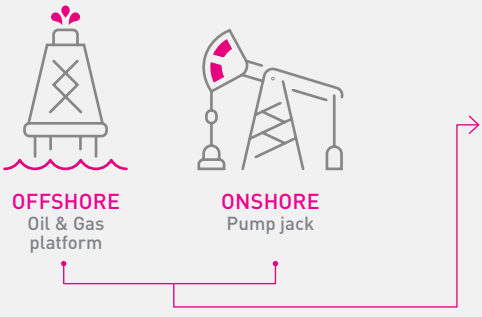
MATERIALS HAVE TO:

- resist service temperatures as low as -254 °C in some LNG applications and as high as 300°C
- handle system pressures ranging from 345 to 2,070 bar
- resist aggressive fluid media, sour gas and salt water
- resist the injection of hot steam
- cope with high deflection (FPSO floating vessels with diameters may soon exceed 4 meters)
- be suitable for long-life seals

Oil & Gas Sectors

UPSTREAM

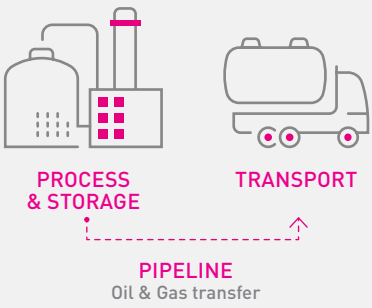
OIL & GAS EXPLORATION/ PRODUCTION



Commonly known as the exploration and production sector and refers to the recovery of hydrocarbon reserves in the form of raw natural gas and crude oil.

MIDSTREAM

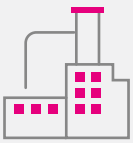
TRANSPORT & STORAGE



Refers to the processing, transportation and storage of crude oil and raw natural gas from the production site to the refinery location.

DOWNSTREAM

PRODUCT, PREPARATION & USAGE



Processing of crude oil and raw natural gas at oil refineries and petrochemical plants into petroleum by-products that are suitable for further distribution at retail outlet level.

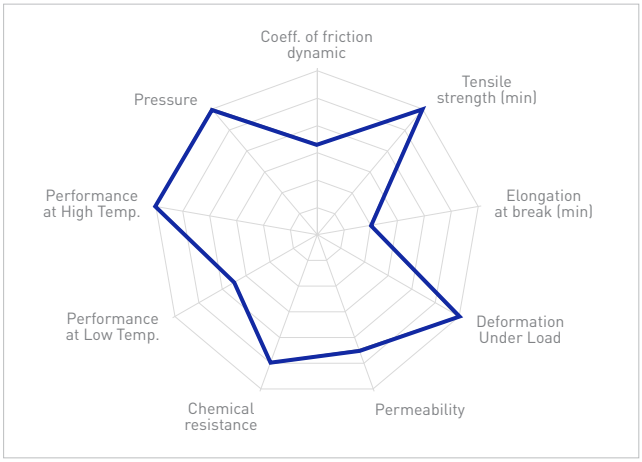
Materials

Our customers can benefit from our substantial in-house expertise in compound development and seal design, manufacturing, application engineering, testing and service capabilities.

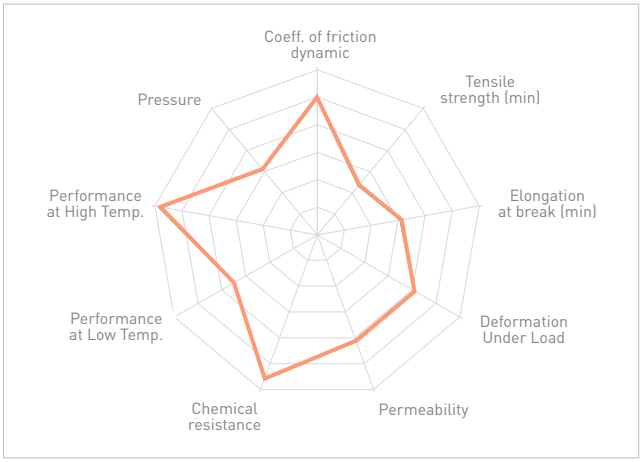
fluorseals has an extensive materials portfolio aimed at providing improved solutions.

Our recommended choice for the O&G industry are the **fluteck™** lines **P**, **K** and **C**.

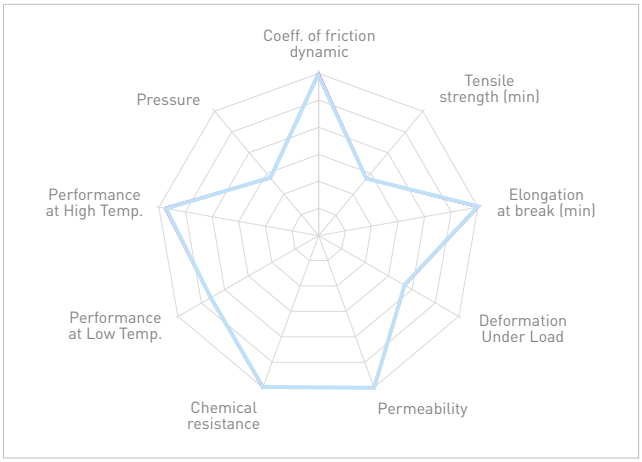
fluteck™ K 300



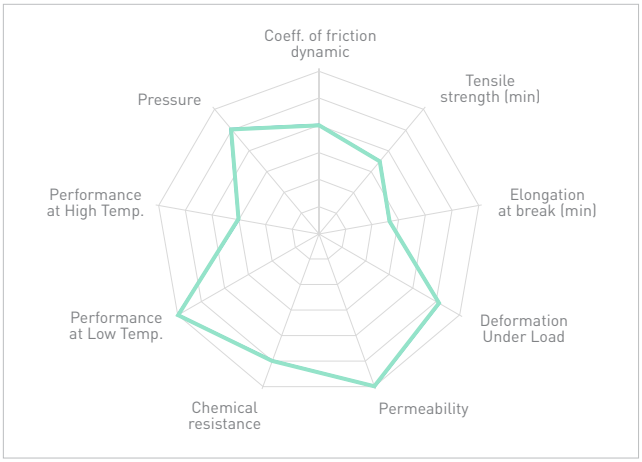
fluteck™ P 7500 CA



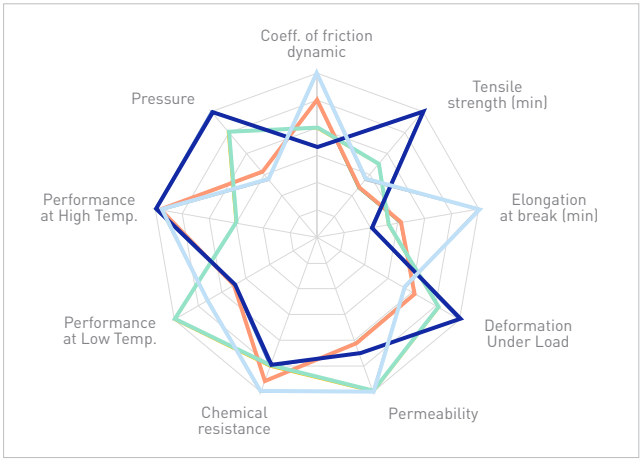
fluteck™ P 1550



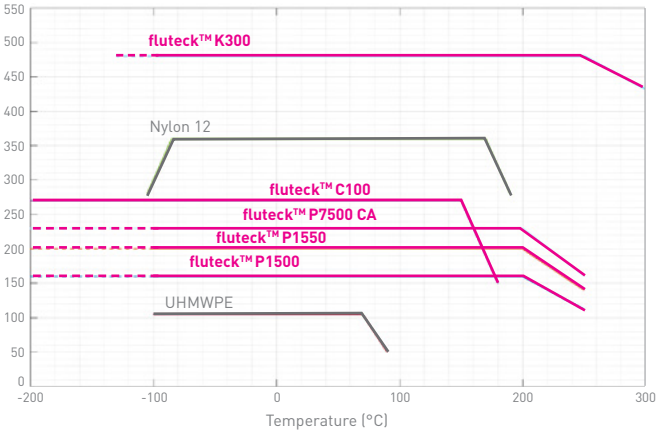
fluteck™ C 100



fluteck™ K 300, P 1550, C 100, P 7500



Pressure



R&D and Quality Lab

Capability and material characterization

Our laboratories have the capability to produce and test materials. They are equipped to perform tests according to international standards. Compliance to customer specifications are available on request.

MECHANICAL TESTS

- Tensile test (from -100°C to 350°C)
- Compression test (from -100°C to 350°C)
- Hardness
- Specific gravity
- Ultra-sonic tests
- MFI
- Friction coefficient and wear tests

ELECTRICAL CONTROLS

- Spark tests (to detect pin holes)
- Dielectrical resistance

THERMAL TESTS AND ANALYSIS

- TGA
- DSC
- TGA FTIR
- SEM
- SEM/EDX spectroscopy
- microscopic measurements

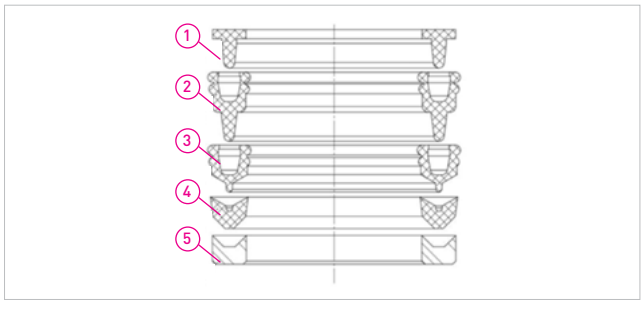
DIMENSIONAL ANALYSIS

- Powder granulometry analysis
- Roughness measurement
- 3D measurements
- Dimensional inspection by HD camera

Finite Element Analysis

Finite Element Analysis (FEA) is the simulation of a physical phenomenon using a numerical mathematic technique. FEA allows to analyze the behavior of real-life components and to predict forces, stresses and deformations within mechanical components under a variety of mechanical and thermal conditions. Specific mechanical tests are performed in the R&D lab to obtain the material data and properties to well simulate them in non–linear FEA. FE simulations helps to study the performance and the behavior of components, optimizing their shape, design and size and are very useful to prevent failures and malfunctions.

fluorseals approves or revises seals and system designs using non-linear Finite Element Analysis software. Seal performance is simulated and verified through testing precisely and quickly, thanks to the plethora of test data available from our proprietary compounds. FEA allows fluorseals to optimize individual parts for a sturdy assembly, as well as the shape and size of the sealing lip and supporting component to ensure the seal unit is durable enough to perform in normal operating conditions.



1. FLS10033 - fluteck™ P 7500 CA
2. FLS10032 - fluteck™ P 1050
3. FLS10031 - fluteck™ P 7500 CA
4. FLS10030 - fluteck™ P 7500 CA
5. FLS10029 - fluteck™ K 300

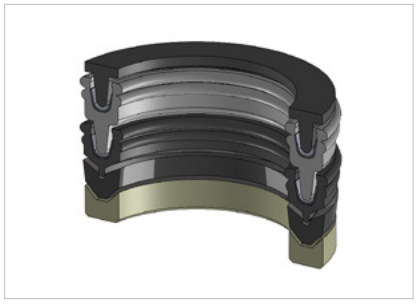


Figure 1 3D model of a fluteck™ stem pack with anti-extrusion ring, sealing elements and energized seals.

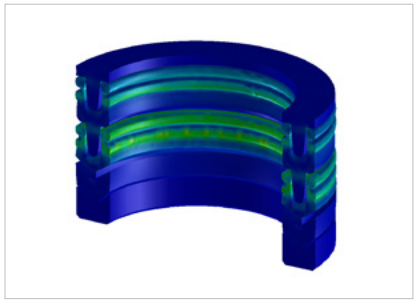


Figure 2 FEA of fluteck™ stem pack groove assembly: Von Mises stress.

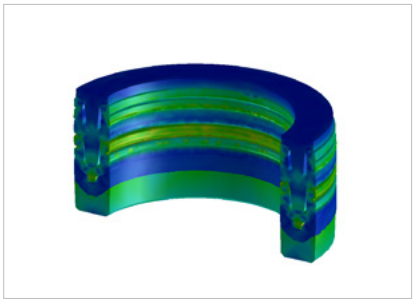


Figure 3 FEA of the fluteck™ stem pack under working pressure. A pressure of 700bar is applied at the top of the stack: Von Mises stress.

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