



WHY USE NORSOK M-710 (ISO 23936-1) MULTIPHASE TESTING



The Norwegian Petroleum Industry has developed the NORSOK Standards to ensure safety, add value and improve the cost-effectiveness of petroleum industry developments and operations.

The NORSOK standard M-710, Rev 3, (ISO 23936-1) defines the requirements for critical non-metallic (polymer) sealing, valve seats, and backup materials for permanent use in subsea, including well completion, Christmas trees, control systems, and valves. The NORSOK Standard applies to topside valves in critical gas systems. This standard lays out the requirements and procedures for the qualification of non-metallic (Polymer) materials for use in various applications in the oil and gas fields.

There are two types of FLUID AGING TESTS included in the NORSOK standard: **SINGLE PHASE** and **MULTIPHASE**.

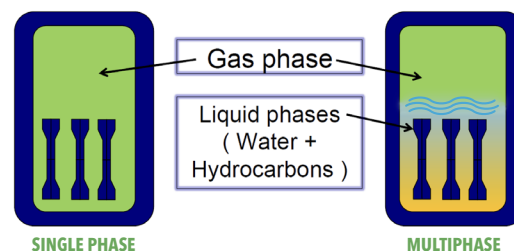
SINGLE PHASE = Gas only

MULTIPHASE = Liquid Phase (Water + Hydrocarbon + Gas)

The FLUID AGING TESTS validate thermoplastic materials' performance and service life in environments simulating those actually used in oil and gas production.

Multiphase testing is the more common method to use. The M-710 Standard uses a test procedure to predict the progressive degradation of thermoplastic materials exposed to a sour multiphase fluid at elevated pressure and temperature over an extended period of time. (~1000 hrs). PEEK (Polyether ether ketone) is a thermoplastic commonly used in sour gas and sweet gas applications.

Further information on the full test procedure can be found in the M-710 standard Test procedure that describes the aging test conditions which must be followed.



Following the completed MULTIPHASE test procedure the material test samples must not exceed these criteria.

ACCEPTED CRITERIA ACCORDING TO NORSOK M-710 STANDARD

- Swelling: +5% / -1%
- Tensile strength elongations, E-modulus: $\pm 50\%$
- Visual inspection: no dissolution tendency, cracking, blistering, or deformation

Elevated sour gas concentration levels can have detrimental effects on the PEEK or other thermoplastic in operation. This will significantly reduce the MTBR and cause safety concerns for the intended dynamic operation.

WHETHER THE THERMOPLASTIC IS INTENDED FOR USE IN SEALING VALVES, COMPRESSORS, OR OTHER ROTATIONAL EQUIPMENT IN SUBSEA OPERATIONS, CONTACT PORT PLASTICS FOR ALL YOUR NEEDS IN TERMS OF POLYMERS FOR THE ENERGY MARKET.

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