

## OILFIELD CHEMICALS HYDRO-TESTING PROCEDURES



Since 1984, INTECNA developed own formulations addressed to Pipelines Hydro-testing procedures in pre-commissioning phase.

An important phase before the pipeline commissioning is the hydraulic test. In such phase the pipeline is filled with water (or seawater) to check failures or pressure losses.

After, the procedure provides other phases, pigging, dewatering, drying depending on the project engineering requirements.

Usually the more diffused fluid used for hydraulic tests is seawater especially for offshore pipelines due to the big volumes involved and to the availability of such fluid on the pipeline location.

In seawater, the corrosion phenomena are related to the presence of Oxygen dissolved (DO), and to the presence and the growth of Bacteria (especially SRB).

To avoid corrosion and biological induced corrosion additives like Corrosion Inhibitors, Oxygen scavenging and Bio-fouling have been used. The more diffused types are :

**OXYGEN SCAVENGERS** (Ammonium Bisulphite – Sodium Bisulphite – Potassium Sulphite)  
**CORROSION INHIBITORS** (Polyphosphates, Polyphosphates – Amines)  
**BIOCIDES** (Glutaraldehyde – Ammonium Quaternary Salts - THPS)

Guidelines in hydraulic tests are reported in several Technical Recommendations or in Technical Specifications :

**SAUDI ARAMCO** provides in own Specifications **SAES – A – 007 Hydrostatic Testing 1997** some guidelines as follows :

To avoid the use of seawater with pH < 7  
To avoid water having a total Bacteria Count (SRS) > 10 exp+2  
To use an Oxygen Scavenger if the contact time seawater-pipeline is in the range of 14 days at residual dosage 20 ppm  
To use Biocides if the contact time seawater – pipeline is in the range of 90 days or more  
To evaluate the cross-compatibility between the additives to be used

**NORSOK** provides in own Specifications **M-DP-001 – 1994** the use of Corrosion Inhibitors, Oxygen Scavengers and Biocides after a complete Corrosivity test.

**DNV** in **RULES FOR SUBMARINE PIPELINE SYSTEMS – 1996** provides that the seawater to be used in hydro-test has to be filtered 50 Microns and TSS not exceeds 20 ppm. Corrosion Inhibitors, Oxygen Scavengers and Biocides **MUST** be evaluated in the environmental discharge impact.

**API – RP 14 E Section 7.4 - API RP 1110 – API RP 1111 Pressure Testing 6.2.4** Specifications give some guidelines in hydro-test procedures.

**GENERAL SPECIFICATION – CORROSION GS COR 560 – TOTALFINA ELF – EXPLORATION PRODUCTION**

Moreover considerable attention continues to be focused on the effects on offshore oil and gas producing operations on the marine and land environment, including the discharge of produced water into the sea.

Removal of produced oil from water has long been recognized as an essential step with strict standards having been established by the U.S. Environmental Protection Agency (EPA). Governmental agencies in other areas of the World ( North Sea, Baltic Sea, Mediterranean Sea) considered pre-approval of chemicals that could be present in produced water discharges.

The effects of various production chemicals added to produced fluids were presented in a report prepared in 1985 for the Offshore Operators Committee (OOC) and submitted to the EPA.

For these reasons, an important aspect in the chemical treatment in pipelines hydrostatic test, is a complete EIA (Environmental Impact Assessment) on aquatic toxicity of the chemicals proposed.

Around the World, have been defined and signed Conventions and Protocols between Countries and such Acts have defined limit and/or guidelines and rules for the treated seawater discharge (HOCNS).

### INTECNA's PRODUCTS RANGE

INTECNA's products meet the requirements of stringent environmental classifications and have been applied in relevant projects around the World (see Reference list and Approvals)

Basically, on the base of accurate laboratory tests, have been selected formulations suitable to grant complete protection against Oxygen corrosion, and Microbial Induced Corrosion.

**OXYGEN SCAVENGERS : Range HYCOR OX**  
**CORROSION INHIBITORS : Range HYCOR FA /PHA**  
**BIOCIDES : Range HYCOR AK/SB**  
**COCKTAIL TREATMENT : Range HYCOR MP**

For every product it has been defined PEC / PNEC with mathematical models to support Contractors and Environmental Authorities in Discharge Permit Approval

Special packaging are available for Contractors requirements (Soluble bags, Soluble tablets)



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