



## Anvol PE 46 XC

Fire resistant hydraulic oil

### Description

Anvol PE 46 XC is a high performance fire resistant hydraulic fluid which is primarily intended for use in steam turbine governor and boiler control systems. It is based on triaryl phosphate esters selected for their excellent hydrolytic stability and contains carefully selected corrosion and oxidation inhibitors. It has excellent hydraulic performance and provides good fire risk protection.

### Application

Anvol PE 46 XC is suitable for use in hydraulic systems where, in the event of leakage or pipe fracture, there is risk of fire and where water containing fluids are unsuitable due to temperature limitations or other reasons. It is specifically designed for use in the electro-hydraulic governor control systems of steam turbines, including systems using fine tolerance servo valves. Anvol PE 46 XC was developed to eliminate service problems in high pressure systems resulting from spool valve erosion/corrosion - fluid leakage and loss of response - by possessing the properties known to minimize this effect, notably high resistivity, low chlorine content and a high level of fluid cleanliness. Physical properties such as foaming, air release and demulsibility are also carefully controlled within turbine manufacturers' specified limits.

Anvol PE 46 XC meets the requirements of:

- BS EN ISO 12922:2002 Class HFDR
- BS EN 61221:2004 (IEC 61221:2004) Category ISO-L-TCD
- Factory Mutual Group 1.
- General Electric GEK 46357.
- Siemens TLV 9012.
- Alstom HTGD 690 149E.
- Alstom SBV PR 1001 B.
- Alstom (UK) TCS 970.
- Ansaldo 602W917, TGM 1911.

### Features and Benefits

- Offers good fire risk protection in systems where fire resistance is vital and where water containing fluids are unsuitable due to temperature limitations or the need to maintain a high hydraulic system pressure.
- High flash point, fire point and auto-ignition temperature provides excellent fire resistance.
- High resistivity eliminates spool valve corrosion/erosion due to electrokinetic effects.
- Low chlorine level minimizes valve erosion.
- High level of fluid cleanliness - minor amounts of particulate contamination can cause abrasive wear, filter blockage and valve sticking.
- Long record of trouble free service in highly demanding hydraulic control systems on turbines.

## Technical Data

Name	Method	Units	Anvol PE 46 XC
Density at 15°C	ISO 12185 / ASTM D4052	g/ml	1.12
Kinematic Viscosity at 40°C	ISO 3104 / ASTM D445	mm <sup>2</sup> /s	43
Kinematic Viscosity at 100°C	ISO 3104 / ASTM D445	mm <sup>2</sup> /s	5
Pour Point	ISO 3016 / ASTM D97	°C	-21
Flash Point, COC	ISO 2592 / ASTM D92	°C	268
Fire Point, COC	ISO 2592 / ASTM D92	°C	368
Autoignition Temperature	ASTM E659	°C	575
Foam Sequence I Tendency / Stability	ISO 6247 / ASTM D892	mls/mls	30/0
Air Release @ 50°C	ISO 9120 / ASTM D3427	mins	1
FZG (A8.3/90)	ISO 14635-1 / DIN 51354	FLS	7
Chlorine Content	IP 510/04	ppm	2
Volume Resistivity@ 20°C	IEC 60247	Mohm/m	160
Wick Ignition - Persistence of Burning	7th Luxemburg Report Section 3.3.2	Secs	5
Spray Ignition (Spray Flamability Parameter)	Factory Mutual		Group 1
Hot Manifold at 704°C	AMS 3150C		No flashing or burning

The above figures are typical of those obtained with normal production tolerance and do not constitute a specification.

## Compatibility

Anvol PE 46 XC is compatible with all metals commonly found in electro-hydraulic control systems. Aluminium components should be hard anodized and the use of copper and copper alloy components kept to a minimum. In common with all phosphate ester fluids, special seals are required and the following materials are suitable:

- Fluoropolymers (Viton)
- Butyl Rubber
- PTFE
- Ethylene Propylene Rubber – under certain operating conditions.

Where paint materials are used, they should be epoxy resin based.

## Additional Information

### Service precautions

Periodic measurement of the fluid neutralisation number should be made during service as this provides a good guide to any product degradation which may occur. The level and rate of change of neutralisation value will be dependant upon the installation, conditions of operation, and whether in-line filtration of the fluid is carried out.

### Conversion precaution

It is essential that rigorous flushing should be carried out when converting systems from other fluids to phosphate esters. All scale should be removed, and filters, hoses, seals and internally painted surfaces should be checked for compatibility with the new fluid.

## Care and Handling

Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

## Packaging and Storage

All packages should be stored under cover. Where outside storage is unavoidable drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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