



Product Data

Castrol Anvol® SWX FM

Fire Resistant Hydraulic Fluids

Description

Castrol Anvol SWX FM are HFDU Polyol ester type hydraulic fluids as defined by ISO 6734/4 and ISO 12922⁽¹⁾. They meet the requirements for Factory Mutual Category 1 Classification. Anvol SWX FM products are outstanding in their category in providing a safe working environment, improved system reliability and ready biodegradability.

Formulated to work in high-pressure hydraulic systems up to 7500 psi. Anvol SWX FM provides gear, vane and piston pumps with protection against wear equivalent to that of mineral oils.

Anvol SWX FM is designed to combine fire resistance with superior system reliability and a reduced tendency to form varnish or sludge in valves, pipes and reservoirs. It also provides greater resistance to water by offering high levels of corrosion protection and ease of separation.

Even in the harshest steel mill environment, Anvol SWX FM provides safety, protection and reliability. This has the added value of reducing failures and minimizing unscheduled downtime.

Application

Anvol SWX FM is used in areas of the manufacturing industry where there is high risk of fire such as hot strip mills, coil handling facilities, pipe mills and continuous casters. The risk is minimized by Anvol SWX FM's high fire point and a low heat of combustion.

Advantages

Greater fire protection- With a high fire point and shear stability, Castrol Anvol SWX FM provides excellent fire suppression characteristics, thereby, creating a safer working environment and greater equipment protection.

System protection from water- Anvol SWX FM is designed to separate water to allow it to be removed from the system. Advanced corrosion inhibition protects ferrous components from any residual water. This reduces rust and leads to extended equipment life and a reduction in downtime.

Stability in harsh operating environments- Resistance to oxidation and thermal degradation and improved filter tolerance

- Reduces sludge / varnish formation and the potential for valve Sticking / failure
- Ensures that product life is extended with greater drain intervals
- Maintains fire protection characteristics with use

Ready Biodegradability- Conforms to highest standards of biodegradability and has low toxicity.

- Environmentally friendly hydraulic fluids providing pump performance that is equivalent to mineral oil.
- Well suited for applications where inadvertent environmental contamination might occur due to leakage.
- Easily exceeds the 60% bio-conversion of CH₂/CH₃ to CO₂ within 28 days as per OECD 301 B.

Superior equipment performance

- Extended pump and component life and reduction in replacement / maintenance costs
- Longer life

⁽¹⁾ per ISO 6743/3 and ISO 12922:1999/Corrigendum 1:2001(E), these are classified as synthetic fluids free of water, but of other composition than HFDR (Phosphate Ester).

Characteristics

	Test Method	Anvol SWX 46 FM	Anvol SWX 68 FM
Factory Mutual Flammability Grouping / Classification	6930	Group 1	Group 1
ISO Designation	6734/4	HFDU	HFDU
Viscosity @ 40°C	ASTM D-445	46	68
Viscosity @ 100°C	ASTM D-445	9.56	12.2
Viscosity Index	ASTM D-2270	183	178
Specific gravity @ 60° F	ASTM D-1298	.90	.91
Demulsibility– Steam (sec)	IP19	400	400
Demulsibility	ASTM D-1401	25 minutes	25 minutes
Fire Point, °C (COC)	ASTM D-92 / IP36	372	374
Flash Point, °C (COC)	ASTM D-92	298	298
Pour Point, °C	ASTM D-97	-19	-26
Foaming	ASTM D-892 / IP 146	-	-
Seq I	-	0/0	10/0
Seq II	-	80/0	100/0
Seq III	-	0/0	20/0
TAN (mgKOH/g)	ASTM D-974	1.4	1.3
Factory Mutual SFP, FM Standard 6930	Calculation	5.0	4.7
Air release @ 50°C, minutes	ASTM D-3427 / IP 313	<0.5	3.9
RBOT oxidation (min)	ASTM D-2272	232	227
Dry TOST (hours to TAN of 2 mg KOH / g)	ASTM D-943	457	457
KRL Shear Stability @ 20 hrs	VW taper bearing	0.6%	0%
FZG	DIN 51354	12 +	12+
% Biodegradability @ 28 days	OECD 301 B	87	75

Compatibility With Seal Materials

Anvol SWX FM fluids are compatible with Acrylonitrile-butadiene rubbers (NBR), hydrogenated NBR and fluorocarbon rubbers (FKM). The Seal Compatibility Index (IP278) for Anvol SWX FM is comparable to mineral oils.

System Changeover

Mineral oil or Polyol Ester based fluids- Anvol SWX FM fluids are miscible and compatible with nearly all mineral oil and polyol ester type hydraulic fluids. To convert a system using these types of fluids, simply drain and recharge with **Castrol Anvol SWX FM**. For proper fire resistance, at least 95% of the mineral oil-based fluid should be removed. See *“Topping up an existing system”* for more detailed changeover information.

Water glycol and emulsions - Anvol SWX FM fluids are not miscible or compatible with water-containing fluids and these fluids must be removed from the system. Remove most of the fluid by draining the reservoir and lines. Remove residual fluid by circulating Anvol SWX FM and draining. Refill with fresh fluid. Repeat until residual fluid is less than 1% of system volume. The lower the residual the better, as water can cause hydrolysis and acid increase/breakdown of the ester in the Anvol SWX FM.

Phosphate ester- Some, but not all phosphate esters, are compatible with Anvol SWX FM. Testing prior to conversion is recommended. Please contact Castrol for testing and conversion recommendations.

Topping up an existing system- If the two products to be mixed have been compatibility checked and are deemed compatible then simply add fresh Anvol SWX FM on top of the existing system. If, however, you are required by Factory Mutual to completely change out the system we suggest the following:

- 1) Heat hydraulic system to operating temperature.
- 2) Drain the warm oil.
- 3) Change existing filters.
- 4) Flush with new fluid. Run all cylinders, if possible, to remove old fluid. Check the Anvol SWX FM content of the system. If greater than 95%, go no further with flushing.
- 5) If Anvol SWX FM is present at less than 95% then drain the system again and fill with fresh Anvol SWX FM.
- 6) Take a sample after one hour of running, if necessary, to check for Anvol SWX FM levels. A fire point may need to be done to confirm Factory Mutual rating.

Health and Safety

Anvol SWX is classified as non-hazardous and presents no significant risks to operators. However, it is good safety procedure to minimize skin contact and inhalation of oil mist.

Storage

To ensure that your product reaches your hydraulic system in excellent condition, it is important to store your drums of product correctly. Where practical place drums under cover out of direct contact with sunlight and weather. Store the drums on their side or use a drum cover to prevent water contacting the drum bung. When decanting product from the drum, ensure that the bung area is cleaned with a lint free cloth before transfer.

Castrol Anvol SWX FM
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