

# Hydransafe FRS

## Fire-resistant synthetic phosphate ester based hydraulic fluids

### APPLICATIONS

Hydraulic circuits.

Hydraulic installations operating near potential ignition sources such as hot or molten metal and requiring the use of safer hydraulic fluids than the conventional petroleum oils: industries such as steel making, metal diecasting, coal mining, power generation or navy buildings.

Working temperature: - 10 to + 70°C (+ 150°C: upper temperature limit for short-term operation).

CAUTION: Not miscible with conventional hydraulic mineral oils or with water-glycol fluids. However, Hydransafe FRS can generally be mixed in any proportion with phosphate ester-based fluids.

Certain precautions must be taken when using Hydransafe FRS especially in an installation designed to accommodate a mineral oil:

- Seals and hoses: these fluids are not compatible with conventional elastomers. Use only fluorinated elastomers (Viton – Teflon).

Paints: Hydransafe FRS will cause normal paints to dissolve or swell. It is best to avoid using paints on tanks (special resins are available that are compatible with phosphate esters).

### ADVANTAGES

Hydransafe FRS are synthetic fluids free of water consisting of phosphate esters. They resist ignition under the most severe conditions and, even if ignited, will not continue to support combustion once the source of ignition is removed.

Their excellent fire-resistance has been demonstrated by the results to the multiple specialized tests designed to reproduce these potential dangers:

- Fire point and autoignition temperature.
- Flow on red-hot metal.
- Projection on fused metal.
- Spray ignition tests.

Hydransafe FRS displays excellent overall performance in hydraulic circuits:

- Excellent lubrication performance and anti-wear properties.
- Good thermal and oxidation stability.
- Low volatility, good filterability.
- Prevention of foaming and quick air release.
- Good resistance to hydrolysis and quick demulsibility.
- Rust prevention (steel, aluminum, brass, zinc, cadmium, magnesium, copper).
- Excellent shear stability.

This lubricant used as recommended and for the application for which it has been designed does not present any particular risk.

A material safety data sheet conforming to the regulations in use in the E.C. can be obtained from your local commercial advisor or downloaded at [ms-sds.totalenergies.com](https://ms-sds.totalenergies.com)

## SPECIFICATIONS

ISO 6743/4 - HFDR

ISO 12922 - HFDR

NFE 48-602 / 48-603 - HFDR

## TYPICAL CHARACTERISTICS

| Properties                          | Units              | Standards                        | Hydransafe FRS      |                     |
|-------------------------------------|--------------------|----------------------------------|---------------------|---------------------|
|                                     |                    |                                  | 32                  | 46                  |
| Appearance                          | -                  | Visual                           | Clear               |                     |
| Density at 15°C                     | kg/m <sup>3</sup>  | ISO 3675                         | 1143                | 1121                |
| Viscosity at 40°C                   | mm <sup>2</sup> /s | ISO 3104                         | 32.3                | 43.0                |
| Viscosity at 100°C                  | mm <sup>2</sup> /s | ISO 3104                         | 4.7                 | 5.3                 |
| Neutralization number               | mgKOH/g            | ISO 6619                         | 0.05                | 0.05                |
| Pour point                          | °C                 | ISO 3016                         | -22                 | -18                 |
| Water content                       | %                  | ISO 760                          | <0.06               | <0.06               |
| Foaming:                            |                    |                                  |                     |                     |
| - Sequence1                         | mL/mL              | ISO 6247                         | 20/0                | 20/0                |
| - Sequence2                         | mL/mL              | ISO 6247                         | 20/0                | 20/0                |
| - Sequence3                         | mL/mL              | ISO 6247                         | 20/0                | 20/0                |
| Flash point                         | °C                 | ISO 2592                         | 340                 | 245                 |
| Fire point                          | °C                 | ISO 2592                         | 330                 | 335                 |
| Autoignition temperature Spray test | °C                 | ASTM D2155                       | 570                 | 545                 |
| Persistence of burning Spray test   | Cotation           | VII Lux. §3.1.2.                 | 6 (pass)            | 6 (pass)            |
| Ignitability index class Spray test | Class              | VII Lux. §3.1.3.                 | -                   | E                   |
| Spray Flammability Parameter (SFP)  | Cotation           | Factory mutual standard Std 6930 | 6 (pass)<br>Group 1 | 6 (pass)<br>Group 1 |
| Persistence of burning              | Cotation           | ISO 14935                        | 9 (pass)            | 9 (pass)            |
| Hot manifold test at 704°C          | Cotation           | ISO 20823                        | pass                | pass                |

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