

# PETRONAS HTO SERIES

## High Performance Heat Transfer Fluids

PETRONAS HTO Series are high performance heat transfer fluids specially developed for open and enclosed heat transfer systems operating at high bulk oil temperatures. Formulated with high quality selected mineral base oils enhanced with advanced anti-oxidant and detergent additives, PETRONAS HTO fluids provide high anti-oxidant protection and detergency to eliminate build-up and deposits.

### Applications

PETRONAS HTO Series fluids are recommended for use in:

- open and enclosed circulated heat transfer systems
- petroleum product processing
- rubber, textile and plastics industries
- solar energy heat transfer and storage

### Features and Benefits

| Features   | Benefits  |
|--|---|
| Excellent heat transfer rates                    | Maintains excellent thermal conductivity which improves system efficiency   |
| High thermal and oxidation stability             | Provides high oxidation stability at elevated temperatures and avoid thermal cracking up 255°C, 305°C, and 315°C according ISO VG 22, 32, and 46 respectively*. Minimizes sludge and acid formation |
| High compatibility with most seal and elastomers | Compatible with most seals and elastomers, which prevents oil leaks and contamination due to seal erosion   |

\*Considering closed system



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**Technical Data Sheet**

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### Typical Properties

| Characteristic  | Method      | Specification | 22            | 32            | 46            |
|---|-------------|---------------|---------------|---------------|---------------|
| Specific Gravity @15°C                                  | ASTM D 4052 | (1)           | 0,868         | 0,871         | 0,877         |
| Kinematic Viscosity at 40°C, cSt                        | ASTM D 445  | (1)           | 22            | 32            | 46            |
| Kinematic Viscosity at 100°C, cSt                       | ASTM D 445  | (1)           | 4,3           | 5,4           | 6,8           |
| Viscosity Index   | ASTM D 2270 | (1)           | 101           | 102           | 102           |
| Flash Point, °C   | ASTM D 92   | (1)           | 190           | 220           | 230           |
| Pour Point, °C  | ASTM D 97   | (1)           | -18           | -15           | -12           |
| TAN, mgKOH/g  | ASTM D 664  | (1)           | 0,10          | 0,10          | 0,10          |
| Copper Strip Corrosion                                  | ASTM D 130  | (1)           | 1b            | 1b            | 1b            |
| Oil load temperature ranges: closed system              |             |               | -7°C to 255°C | -4°C to 305°C | -2°C to 315°C |
| Oil load temperature ranges: open system                |             |               | -7°C to 130°C | -4°C to 180°C | -2°C to 190°C |
| Thermal Conductivity, W/MK                              |             |               |               |               |               |
| 44°C  |             |               | 0,178         | 0,182         | 0,193         |
| 74°C  |             |               | 0,171         | 0,176         | 0,180         |
| 103°C   |             |               | 0,165         | 0,170         | 0,173         |
| 123°C   |             |               | 0,155         | 0,160         | 0,165         |
| Specific Heat, J/g°C                                    |             |               |               |               |               |
| 30°C  |             |               | 2,0340        | 2,0405        | 1,9651        |
| 40°C  |             |               | 2,0735        | 2,0776        | 2,0042        |
| 50°C  |             |               | 2,1138        | 2,1143        | 2,0423        |
| 60°C  |             |               | 2,1555        | 2,1524        | 2,0779        |
| 70°C  |             |               | 2,1973        | 2,1905        | 2,1174        |
| 80°C  |             |               | 2,2428        | 2,2303        | 2,1568        |
| 90°C  |             |               | 2,2957        | 2,2778        | 2,2053        |
| 100°C   |             |               | 2,3331        | 2,3115        | 2,2391        |
| 110°C   |             |               | 2,5421        | 2,3490        | 2,2765        |
| 120°C   |             |               | 2,3755        | 2,3867        | 2,3153        |
| 130°C   |             |               | 2,4192        | 2,4298        | 2,3553        |
| 140°C   |             |               | 2,4647        | 2,4653        | 2,3923        |
| 150°C   |             |               | 2,5053        | 2,5009        | 2,4297        |
| Coefficient of Thermal Expansion, g/cm <sup>3</sup> /°C |             |               | 0,00068       | 0,00063       | 0,00063       |

All technical data are provided for reference only / SS is available upon request including quality control limits / (1): not required in specification

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### Performance Levels

- DIN 51522
- ISO 6743-12 Family Q

### Health, Safety and Environment

This product is unlikely to present any significant health and safety hazards when used in the recommended application. Avoid contact with skin. Wash immediately with soap and water after skin contact. Do not discharge into drains, soil or water.

For further detail regarding storage, safe handling, and disposal of product, please refer to product SDS or contact us at: [www.pli-petronas.com](http://www.pli-petronas.com).

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