# INDUSTRIAL FLUIDS

## FIRE RESISTANT TURBINE LUBRICANTS

### for Industrial Applications

| Typical Property | Turbinol[R] 1223 | Turbinol[R] 1122 |
|---|---|---|
| Viscosity in centistokes at | | |
| 210°F. | 6.02 | 4.82 |
| 100°F. | 51.7 | 31.9 |
| 40°F. | 750 | 320 |
| Viscosity, SSU | | |
| 210°F. | 45.9 | 42.1 |
| 100°F. | 240 | 150 |
| 40°F. | 3460 | 1480 |
| Pour Point, °F. | -5 | -20 |
| Specific Gravity, 25/25°C. | 1.142 | 1.173 |
| Density, grams/ml | | |
| 210°F. | 1.07 | 1.13 |
| 100°F. | 1.11 | 1.17 |
| 40°F. | 1.14 | 1.20 |
| Moisture, % maximum | 0.10 | 0.10 |
| Acidity, NN maximum | 0.10 | 0.10 |

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WATER_PCB-00007004

| Typical Property | Turbinol 1223 | Turbinol 1122 |
|---|---|---|
| Specific Heat, BTU/lb/°F. | | |
| 60°F. | 0.37 | 0.36 |
| 100°F. | 0.38 | 0.38 |
| 150°F. | 0.40 | 0.39 |
| 200°F. | 0.42 | 0.41 |
| Thermal Conductivity, BTU/hr/°F./ft. | | |
| 60°F. | 0.073 | 0.074 |
| 100°F. | 0.073 | 0.074 |
| 150°F. | 0.073 | 0.073 |
| 200°F. | 0.072 | 0.073 |
| Vapor Pressure, mm HG at 200°F. | 0.002 | 0.002 |
| Solubility in Water | Negligible | Negligible |

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## Fire Resistance

| Typical Property | Turbinol 1223 | Turbinol 1122 |
|---|---|---|
| Flash point, °F. | 480 | 470 |
| Fire point, °F. | 620 | 650 |
| AIT, °F. (ASTM D2155) | 910 | 1050 |
| AIT, °F. (ASTM D286) | > 1000 | > 1000 |
| High Pressure Spray (AMS 3150C) | Intermittent flashing, self-extinguishing | Intermittent flashing, self-extinguishing |
| Hot Manifold (FS 791) | | |
| 1300°F. | Flashes, does not propogate | Flashes, does not propogate |
| 950°F. | Does not flash or burn | Does not flash or burn |
| Molten Metal Test at 1300°F. | No ignition | No ignition |

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## Performance Properties

| Typical Property | Turbinol 1223 | Turbinol 1122 |
|---|---|---|
| Rust Test (ASTM D665) 24 hr., distilled water | Pass | Pass |
| Foam Test (ASTM D892) Sequence 1, 2, 3 | Pass | Pass |
| Oxidation and Corrosion Test (168 hrs., air) | | |
| Test temperature | 250°F. | 250°F. |
| Metal weight changes in $mg/cm^2$ | | |
| Magnesium | 0.00 | -0.02 |
| Aluminum | +0.01 | +0.02 |
| Cadmium | +0.03 | +0.04 |
| Steel | +0.04 | -0.01 |
| Copper | -0.16 | -0.16 |
| Acidity increase, NN | 0.00 | +0.02 |
| 100°F. viscosity increase, % | +4.6 | +3.6 |
| Alcor Deposition Test (Oil in 250°F., 48 hrs. 1000 ml/min. air flow) | | |
| Tube temperature | 450°F. | 450°F. |
| Overall rating | 22.7 | 29.5 |
| Critical temperature | 515°F. | >460°F. |
| Filter deposit, mg. | 0.8 | 0.4 |



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| Typical Property | Turbinol 1223 | Turbinol 1122 |
|---|---|---|
| Four Ball Wear Test, scar diameter in mm. 625 rpm, 167°F., 1 hr. | | |
| Steel on steel | | |
| 10 kg load | 0.44 | 0.40 |
| 40 kg load | 0.58 | 0.58 |
| Steel on bronze | | |
| 10 kg load | 0.42 | 0.42 |
| 40 kg load | 0.65 | 1.01 |

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## Compatibility with Materials

### Metals

Turbinol 1223 and Turbinol 1122 are compatible with all commonly used metals of construction.

### Packings, Seals, Hoses and Bladders

The following polymeric non-metallic materials are compatible with Turbinol 1223 and Turbinol 1122: butyl, EPR, EPT, Viton, Teflon, nylon and silicones. Materials are available from a number of suppliers. Turbinol 1223 is classed as a synthetic straight phosphate ester fire resistant fluid and lubricant.

### Paints

Cured epoxy, phenolic, polyurethane and nylon based paints are satisfactory for use with Turbinol 1223 and Turbinol 1122.

### Other Lubricants

Turbinol 1223 and Turbinol 1122 are miscible in all proportions with Turbinol 153. They will dissolve only small amounts (3-5%) of most types of petroleum oils.



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## Toxicity and Safe Handling

Animal studies indicate that Turbinol 1223 and Turbinol 1122 can be classed as practically non-toxic when considered as an industrial fluid. They are non-irritating when the skin is exposed to the fluid.

In case of skin contact wash off with soap and water as a hygienic procedure. In the case of eye contact flush with copious amounts of water.

Due to their low order of toxicity, Turbinol 1223 and Turbinol 1122 require no special handling precautions.

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