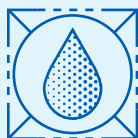




CITGO[®] HyDurance[®] AW Fluids

OVERVIEW



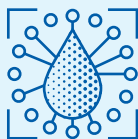
- Superior anti-wear hydraulic and circulating oils specially formulated to offer excellent service in high-pressure, high-output industrial hydraulic circuits.
- Chemically stable with excellent resistance to sludge formation. Exhibit excellent protection and filterability.

FEATURES & BENEFITS



- Formulated with high-quality base stocks and premium additive components.
- Thermal stability for superior resistance to heat-related sludging in sensitive electro-hydraulic servos.
- Good hydrolytic stability means they will not contribute to the formation of metal-etching acids or corrosive reactants.
- Inhibited against rusting in both fresh and sea water, passing both A and B Procedures of the ASTM D665 Rust Test.
- Excellent anti-wear protection to pumps, motors, valves, and other hydraulic circuit components. Approved against stringent equipment performance requirements.
- Resistant to foaming and will not foster abnormal air entrainment in properly designed hydraulic circuits.
- Superior demulsibility to readily separate water, permitting draining of contaminating water from circulating systems.
- Premium performance in wet and dry filterability testing.

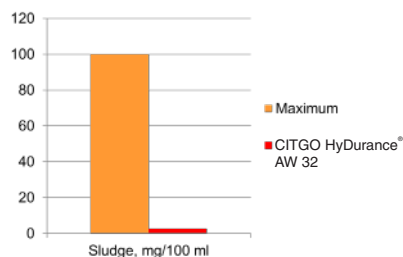
APPLICATIONS



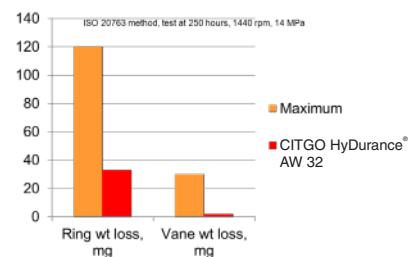
- Recommended for service in industrial and mobile hydraulic systems when used in accordance with equipment manufacturers' recommendations.
- Designed to provide enhanced service life to vane, piston, and gear pumps as well as other circuit components such as motors and servos.
- Recommended for use as a gear and bearing lubricant in industrial applications where rust- and oxidation-inhibited oils are required.
- Meet or exceed the following manufacturer specifications:

| | |
|-------------------------------|------------------------|
| ASTM D6158 HM | General Motors LS-2 |
| Fives Cincinnati P-68, 69, 70 | JCMAS HK P041 |
| Parker Denison HF-0 | ISO 11158 HM |
| DIN 51524-2 | SEB 181 222 |
| Eaton Brochure 03-401-2010 | US Steel 126, 127, 136 |
| Bosch Rexroth RDE-90235 | |

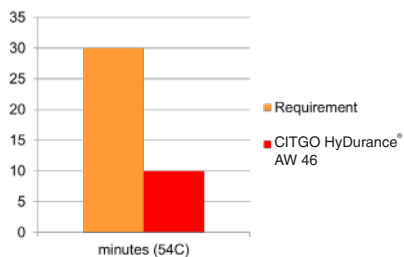
Parker Denison HF-0 Thermal Stability



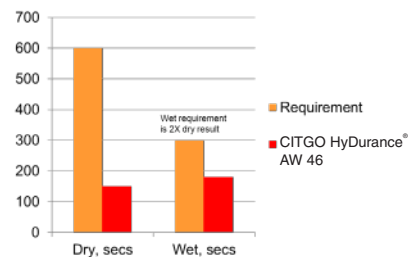
V104C Vane Pump Wear Data



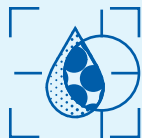
Parker Denison HF-0 Demulsibility



Parker Denison HF-0 Filterability



PROPERTIES



Typical Properties for CITGO HyDurance AW Fluids:

| Grade | 22 | 32 | 46 | 68 | 100 | 150 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| Material Code | 633606001 | 633607001 | 633608001 | 633609001 | 633610001 | 633611001 |
| Gravity, ASTM D4052, °API | 33.7 | 32.6 | 31.2 | 30.8 | 28.6 | 29.3 |
| Density, lb/gal | 7.13 | 7.18 | 7.24 | 7.26 | 7.36 | 7.33 |
| Flash Point, ASTM D92, °F (°C) | 399 (204) | 417 (214) | 446 (230) | 468 (242) | 471 (244) | 500 (260) |
| Viscosity | | | | | | |
| cSt at 40°C | 223 | 32.3 | 46.6 | 68 | 98 | 149 |
| cSt at 100°C | 4.45 | 5.59 | 6.96 | 9.0 | 11.1 | 14.8 |
| Viscosity Index | 110 | 111 | 106 | 107 | 98 | 99 |
| FZG (A/8.3/90), pass load, ISO 14635-1 | 12 | 12 | 12 | 12 | 12 | 12 |
| Pour Point, ASTM D97, °F (°C) | -40 (-40) | -40 (-40) | -36 (-33) | -36 (-33) | -36 (-33) | -31 (-24) |
| Color, ASTM D1500 | L0.5 | L0.5 | L0.5 | L0.5 | L3.0 | L2.5 |
| Water Separability, ASTM D1401 ⁽¹⁾ | 40-40-0 | 40-40-0 | 40-40-0 | 40-40-0 | 40-40-0 | 40-40-0 |
| Oxidation Test, ASTM D943, Hrs. | 6000 | 6000 | 6000 | 5000 | 4000 | 2850 |
| Rust Test ASTM D665 A, B ⁽²⁾ | Pass | Pass | Pass | Pass | Pass | Pass |
| Meets Fives Cincinnati Requirement | — | P-68 | P-70 | P-69 | — | — |
| AFNOR NF E 48-603 | HM22 | HM32 | HM46 | HM68 | HM100 | HM150 |
| ISO VG No. | 22 | 32 | 46 | 68 | 100 | 150 |

Notes: (1) 30 minutes max. separation time to ≤3ml emulsion. Test temperature is 130°F for grades up through ISO 68. Test temperature is 180°F for ISO 100 and 150.

(2) Pass - No Rust.(2) Procedure A (distilled water)

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