

## EnBio TCS®

The "NO BURN" Hydraulic Fluid

## **Product Description**

EnBio TCS hydraulic fluid has been specifically formulated to meet the needs of your course and your equipment. Our patented synthetic will last longer, improve hydraulic system efficiency, and reduce equipment wear and overall maintenance costs; combining high-performance and environmental safety. EnBio TCS's superior performance characteristics allow it to be used across all types of mobile equipment. Welcome to the next generation of high-performance hydraulic fluids.

## **Product Features & Benefits**

- **High Viscosity Index (VI)** A high VI means EnBio can be used over a wide temperature range with minimal impact on fluid viscosity. This eliminates the need to use two different grades of hydraulic fluid for summer and winter. High VI also allows the equipment to operate at a lower temperature.
- Anti-Wear Outstanding anti-wear performance leads to a longer, more reliable service and equipment life
  through lower friction and higher gear efficiencies. These factors result in lower maintenance and energy costs,
  and less machine downtime.
- Long Fluid Life A unique additive package provides unsurpassed thermal and oxidative stability. This means
  EnBio remains clean, will not sludge or varnish, and can last over 2 times longer than mineral oils and 3 to 4
  times longer than bio-based fluids. Longer fluid life means even greater maintenance cost savings and equipment
  downtime.
- No Shearing Will not shear (change viscosity) even when operating in high-temperature and pressure
  environments. This means consistent performance throughout the fluid lifecycle.
- Increased System Performance When a system is converted to EnBio TCS from a bio-based or mineral oil, EnBio TCS will dissolve residual sludge and varnish buildup, which leads to a cleaner system.
- Fire Resistant An anhydrous water-soluble fluid with high flash and fire points that make the fluid fire resistant and well suited for high-temperature applications.
- **No Burn** Extensive testing on golf courses has proven that a spill of EnBio TCS does not kill grass, which has led to superintendents naming it the "No Burn" hydraulic fluid. When washed in accordance to spill management procedures, there is no evidence of a spill and no decrease in turf density.
- Readily Biodegradable Classified as readily biodegradable (by OECD 301B/301F test method) and is dyed blue for ease of detection when a spill occurs. Once cleaned with a simple soap and water solution, EnBio will not leave stains on concrete or asphalt.
- **Non-Toxic** Classified ecologically harmless, as it has no significant hazard to mammals, plant life or aquatic life. Under OECD guideline 420 for acute oral toxicity testing, EnBio is classified as a "compound" that does not present a significant acute toxic risk if swallowed.
- No Sheen Should EnBio accidentally spill into waterways it will not form a streak on water (sheen), nor will it
  form an emulsion or sludge. This prevents contamination related issues for plants and animal habitats that exist
  on the surface or in contact with the water. These factors make EnBio ideally suited for environmentally sensitive
  applications.
- No Odor No odor will be emitted from the fluid at any temperature range.
- **EPA EAL** Meet's the Environmental Protection Agency's 2013 Vessel General Permit (VGP) guidelines as an Environmentally Acceptable Lubricant (EAL).
- OEM Specs Meets or exceeds many pump manufacturer specifications including Bosch-Rexroth, Danfoss, Eaton and Parker.



## **Typical Physical & Chemical Properties**

150 Viscosity Grade	Test	Method	Typical Results
ASTM D445         47.8           Viscosity @ 100°C (Cst)         ASTM D445         9.79           Viscosity @ 0°C (Cst)         ASTM D445         9.79           Viscosity @ 0°C (Cst)         ASTM D445         481.6           Specific Gravity @ 20°C         ASTM D1298         1.06           Viscosity Index         ASTM D2270         197           Flash Point (lopen cup) (°F)         ASTM D92         436           Flash Point (Closed cup) (°F)         ASTM D93         429           Fire Point (°F)         ASTM D92         454           Pour Point (°F)         ASTM D99         -49           Foam Test — seq.1,11,111         ASTM D892         0/0:30/0:0/0           Corpor Strip Corrosion         ASTM D130         18           Turbine Oxidation         ASTM D413         > 7000 Hours           Fourball Anti-Wear (mm wear scar)         ASTM D4172         0.35           Fourball EP (mm wear scar)         ASTM D2783         0.32           Sonic Shear Stability         - initial viscosity @ 40°C (Cst)         ASTM D5621         47.82           - irradiated viscosity @ 40°C (Cst)         ASTM D5621         47.82           - irradiated viscosity @ 100°C (Cst)         47.79         9.75           Fuel Injection Shear Stabili	Appearance		Blue fluid
Viscosity @ 100°C (Cst)         ASTM D445         9.79           Viscosity @ 0 °C (Cst)         ASTM D445         481.6           Specific Gravity @ 20°C         ASTM D1298         1.06           Viscosity Index         ASTM D220         197           Flash Point (open cup) (°F)         ASTM D92         436           Flash Point (Closed cup) (°F)         ASTM D93         429           Fire Point (°F)         ASTM D92         454           Pour Point (°F)         ASTM D97         -49           Foam Test — seq.1,11,111         ASTM D892         0/0:30/0:0/0           Corrosion Protection         ASTM D655A & B         Pass           Copper Strip Corrosion         ASTM D130         1B           Turbine Oxidation         ASTM D934         >7000 Hours           Fourball Anti-Wear (mm wear scar)         ASTM D4172         0.35           Fourball EP (mm wear scar)         ASTM D4172         0.35           Sonic Shear Stability         - initial viscosity @ 40°C (Cst)         ASTM D5621         47.82           - irradiated viscosity @ 40°C (Cst)         ASTM D5621         9,79           - initial viscosity @ 100°C (Cst)         ASTM D5821         9,75           Fuel Injection Shear Stability Test         ASTM D 3945         NO Viscosit	ISO Viscosity Grade		46
ASTM D445   A81.6	Viscosity @ 40°C (Cst)	ASTM D445	47.8
Specific Gravity @ 20°C	Viscosity @ 100°C (Cst)	ASTM D445	9.79
Viscosity Index	Viscosity @ 0 °C (Cst)	ASTM D445	481.6
Flash Point (open cup) (°F)	Specific Gravity @ 20°C	ASTM D1298	1.06
Flash Point (Closed cup) (°F)	Viscosity Index	ASTM D2270	
Fire Point (°F)  ASTM D92  454  Pour Point (°F)  Foam Test — seq.1,11,111  ASTM D892  O/0:30/0:0/0  Corrosion Protection  ASTM D665A & B  Pass  Copper Strip Corrosion  ASTM D130  18  Turbine Oxidation  Fourball Anti-Wear (mm wear scar)  Fourball EP (mm wear scar)  Fourball EP (mm wear scar)  ASTM D2783  O.32  Sonic Shear Stability  - initial viscosity @ 40°C (Cst)  - irradiated viscosity @ 40°C (Cst)  - initial viscosity @ 40°C (Cst)  - initial viscosity @ 100°C (Cst)  - initial viscosity @ 100°C (Cst)  - irradiated viscosity @ 100°C (Cst)  - irradiated viscosity @ 100°C (Cst)  - STM D5621  ASTM D5621  47.82  - irradiated viscosity @ 100°C (Cst)  - initial viscosity @ 100°	Flash Point (open cup) (°F)	ASTM D92	436
Pour Point (°F)         ASTM D97         -49           Foam Test — seq.1,11,111         ASTM D892         0/0:30/0:0/0           Corrosion Protection         ASTM D665A & B         Pass           Copper Strip Corrosion         ASTM D130         1B           Turbine Oxidation         ASTM D934         >7000 Hours           Fourball Anti-Wear (mm wear scar)         ASTM D4172         0.35           Fourball EP (mm wear scar)         ASTM D2783         0.32           Sonic Shear Stability         - initial viscosity @ 40°C (Cst)         ASTM D5621         47.82           - irradiated viscosity @ 40°C (Cst)         ASTM D5621         9,79           - initial viscosity @ 100°C (Cst)         ASTM D5621         9,79           - irradiated viscosity @ 100°C (Cst)         ASTM D345         NO Viscosity Loss           V104 Vane Pump Test (mg/hr)         DIN 51,389 M         0.018           35 VQ Vickers Vane Pump Test         2950-S         Pass           FZG Visual Gear Test         ASTM D5182         Passes 12 stages           Modified Sturm Biodegradability Test (28 days)         OECD 301B         Readily Biodegradable           Sea Water         96 Hour Sheephead Minnow LC50 (mg/l)         >1,000           96 Hour Fathead Minnow LC50 (mg/l)         OECD 203         >50,000			
Foam Test — seq.1,11,111	Fire Point (°F)	ASTM D92	454
Corrosion Protection  ASTM D665A & B Pass Copper Strip Corrosion  ASTM D130  1B Turbine Oxidation  ASTM D934  Fourball Anti-Wear (mm wear scar)  ASTM D4172  0.35 Fourball EP (mm wear scar)  ASTM D2783  0.32 Sonic Shear Stability  - initial viscosity @ 40°C (Cst)  - irradiated viscosity @ 40°C (Cst)  - initial viscosity @ 100°C (Cst)  - 47.79  - initial viscosity @ 100°C (Cst)  - 47.82  - 47.82  - 47.82  - 47.82  - 47.79  - initial viscosity @ 100°C (Cst)  - 57.00  - 100°C (Cst)	. ,		
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Turbine Oxidation ASTM D934 >7000 Hours Fourball Anti-Wear (mm wear scar) ASTM D4172 0.35  Fourball EP (mm wear scar) ASTM D2783 0.32  Sonic Shear Stability  - initial viscosity @ 40°C (Cst) ASTM D5621 47.82 - irradiated viscosity @ 40°C (Cst) 47.79 - initial viscosity @ 100°C (Cst) ASTM D5621 9,79 - irradiated viscosity @ 100°C (Cst) 9,75  Fuel Injection Shear Stability Test ASTM D 3945 NO Viscosity Loss V104 Vane Pump Test (mg/hr) DIN 51,389 M 0.018  35 VQ Vickers Vane Pump Test 2950-S Pass FZG Visual Gear Test ASTM D5182 Passes 12 stages  Modified Sturm Biodegradability Test (28 days) OECD 301B Readily Biodegradable  Sea Water  96 Hour Sheephead Minnow LC50 (mg/l) >1,000  976 Hour Mysid Shrimp LC50 (mg/l) >1,000  Fresh Water  16 Hour Bacterial Inhibition IC50 (mg/l) OECD 203 >50,000  16 Hour Bacterial Inhibition IC50 (mg/l) 22,000	Corrosion Protection		
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Fourball EP (mm wear scar)  Sonic Shear Stability  - initial viscosity @ 40°C (Cst)  - irradiated viscosity @ 40°C (Cst)  - initial viscosity @ 100°C (Cst)  - initial viscosity @ 100°C (Cst)  - initial viscosity @ 100°C (Cst)  - irradiated viscosity @ 100°C (Cst)  - irradiated viscosity @ 100°C (Cst)  Fuel Injection Shear Stability Test  ASTM D 3945  Fuel Injection Shear Stability Test  ASTM D 3945  NO Viscosity Loss  V104 Vane Pump Test (mg/hr)  DIN 51,389 M  0.018  35 VQ Vickers Vane Pump Test  2950-S  Pass  FZG Visual Gear Test  ASTM D5182  Passes 12 stages  Modified Sturm Biodegradability Test (28 days)  OECD 301B  Readily Biodegradable  Sea Water  96 Hour Sheephead Minnow LC50 (mg/l)  >1,000  Fresh Water  96 Hour Fathead Minnow LC50 (mg/l)  OECD 203  >50,000  16 Hour Bacterial Inhibition IC50 (mg/l)  22,000	Turbine Oxidation		
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Gea Water       96 Hour Sheephead Minnow LC50 (mg/l)       >1,000         96 Hour Mysid Shrimp LC50 (mg/l)       >1,000         Fresh Water       96 Hour Fathead Minnow LC50 (mg/l)       OECD 203       >50,000         16 Hour Bacterial Inhibition IC50 (mg/l)       22,000			_
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26 Hour Fathead Minnow LC50 (mg/l)       OECD 203       >50,000         6 Hour Bacterial Inhibition IC50 (mg/l)       22,000	96 Hour Mysid Shrimp LC50 (mg/l)		>1,000
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90 FIGUE 1740 HIJA 1944 HIJA EV 20 HIJA HIJA HIJA HIJA HIJA HIJA HIJA HIJA	48 Hour Daphina Magna EC50 (mg/l)	OECD 202	>40,000