



## CITGO CITCOOL® CONCENTRATES

Date 01/04

**DESCRIPTION:** These are unique heavy-duty, synthetic coolant concentrates containing lubricity agents, anti-corrosion additives and other components to satisfy the demands of today's high-performance machining operations. When diluted with water in the proper concentrations, these premium products function as heavy-duty cutting fluids. Containing no oil, these fluids show distinct advantages over the more conventional "soluble" or "emulsifiable" cutting oils commonly used in industry, particularly in the areas of ease of mixing and cleanup, improved solution stability, freedom from odor and rancidity, heat transfer, and work face visibility.

Fluids prepared from CITCOOL® Concentrates find special uses in a variety of metalworking processes where the cooling effects of water coupled with a balanced lubricity-corrosion protection additive package serve to prevent chip buildup and wear at the critical tool-workpiece interface. This extends tool life and improves worked surface finish.

### QUALITIES & BENEFITS:

- Provide extreme pressure properties for heavy-duty operations.
- Mix easily – no special procedures required.
- Exhibit transparency for better viewing of the workpiece during processing.
- Eliminate oil mists associated with petroleum oil products.
- Contain no oil; leave no gummy residue.
- Produce stable mixtures in hard water.
- Provide excellent rust and corrosion protection.
- Reject tramp oil readily.
- Exhibit biodegradability.
- Contain a fungicide to protect against initial fungal growth in service. Monitoring microbial activity over extended service periods would be advisable to determine need for additional treatment.
- Contain no phenols, nitrites, PCB's or heavy metals.
- Resist sludge buildup; economical.
- Display distinctive yellow color for 22 and blue color for 33.
- Wash off parts in cool water.

**APPLICATIONS:** CITCOOL® 22 Concentrate is a microemulsion designed for use with aluminum, magnesium and their alloys, yellow metals, and moderately heavy-duty application on ferrous metals. Appearance will vary from virtually clear to hazy depending upon the hardness of the water blended with it.

CITCOOL® 33 Concentrate is designed primarily for use in machining titanium, ferrous metals and their alloys and stainless steels. It is non-corrosive to brass and copper and may be used in metalworking processes with these metals. It is not recommended for use in the machining of aluminum, magnesium and their alloys due to possible staining.

- CAUTION:**
1. Plexiglass windows or shields have become "crazed and cracked" from diluted CITCOOL® 33 Concentrate contact. Other window or shield materials such as those made from K-Resin are not affected.
  2. Some paints or coatings on machine surfaces may dissolve or peel after prolonged contact with CITCOOL® 33. Recommended paints: Epoxy. Not recommended: Acrylic and Lacquer-based coating. Questionable: Oil-resistant Alkyd paints.
  3. CITCOOL® 33's distinctive blue color can fade during storage and use. The change in the color of CITCOOL® 33 does not have any effect on the performance of the product.

**TYPICAL PROPERTIES:**

**CITCOOL® CONCENTRATES**

	<b>22</b>	<b>33</b>
Material Code	639322001	639333001
Appearance, Concentrate (neat)	Clear, orangish amber <sup>(1)</sup>	Clear, Blue
Dilution (5% in DI water)	Clear, yellow <sup>(1)(2)</sup>	Clear, Blue <sup>(2)</sup>
Specific Gravity, 60/60°F, ASTM D 1298	1.05	1.07
Pounds Per Gallon	8.7	8.9
Viscosity, ASTM D 445, cSt at 40°C	5.5	3.7
ASTM D 2161, SUS at 100°F	44	17
ph, Concentrate	8.4	9.5
Falex Load, 5% in tap water. ASTM D 3233, lbs.	4500	4500
Rust Test, 3% in tap water, ASTM D 4627	Pass	Pass
Solution Stability (5%), 24 hrs. at 30°F	No Separation	No Separation
Copper Corrosion (5%), 3 hrs. at 122°F, ASTM D 130		1B
Foam Test, ASTM D 892, Seq. I	Pass <sup>(3)</sup>	90-0
Seq. II		10-0
Seq. III		20-0

**Notes:**

- (1) With fluorescent green tint.
- (2) Dilute solutions can be hazy if tap water is used depending upon water hardness.
- (3) ASTM D 3601, Break in 30 sec.

**STORAGE, HANDLING AND SPECIAL CONSIDERATIONS:**

- (1) Preferred storage is indoors away from sun and heat.
- (2) While product is not known to be hazardous under normal use, normal precautions should be taken to avoid eye, skin and clothing contact. For safety information see the CITCOOL® product label and its Material Safety Data Sheet.
- (3) Do not allow to freeze. Under long term storage, product may discolor.

**CITCOOL® CONCENTRATES 22 & 33 (Water Dilution Rates)<sup>(1)</sup>  
METAL MACHINABILITY GROUPS**

Machining Operation	1	2	3	4
	Non-Ferrous Soft Metals <sup>(2)</sup>	Nickel Alloys, Nitralloy Steels, Cast Irons and Alloy Steels (up to 200 Brinell)	Stainless Steels, "Monel" Metals, Cast Irons and Alloy Steels (200 to 300 Brinell) <sup>(3)</sup>	Titanium Alloys, High Tensile Nickel Alloys, Austentic Stainless Steels, Tool Steel and High Tensile Allow Steels (300 to 400 Brinell) <sup>(3)</sup>
Turning, Boring, Milling, Forming, Drilling, Sawing	20:1	20:1	10:1	10:1
Tapping, Thread Rolling, Reaming, Screw Cutting, Broaching	20:1	20:1	10:1	10:1
Gear Shaping, Form and Thread Milling, Shaving and Hobbing, Trepanning	20:1	20:1	10:1	10:1
Internal and External Grinding, Form and Thread Grinding	20:1	20:1	20:1	20:1
Stamping	10:1	10:1	5:1	5:1

**NOTES:**

- (1) Dilution ratios shown are approximate and may require higher or lower water concentrations depending on a number of factors including the type of metal cut, machine speed, the severity of the operation, metal hardness, etc.
- (2) CITCOOL® 22 is suitable for machining aluminum alloys (non-staining). CITCOOL® 33 is not recommended for machining aluminum alloys or magnesium (due to possible staining).
- (3) CITCOOL® 22 not recommended.