



## Hydroclear™ Quench Oil

Conoco Hydroclear™ Quench Oil is a high-quality metal heat-treating oil developed for quenching ferrous metals in a wide variety of applications where controlled cooling rates and specific quench speeds are required.

Hydroclear™ Quench Oil is available in four viscosity grades, quenching speeds and controlled cooling rates for specific quenching applications: 22, 22MS, 22HS and 32HS. Each grade is specifically developed to combine gradual decrease in temperature during the initial boiling phase followed by maximum cooling and controlled convection to induce desired Rockwell or Brinell metal hardness.

Hydroclear™ Quench Oil is formulated with select hydrocracked base oils and additives to provide enhanced oxidation resistance, excellent wetting ability, reduced drag-out and smoke, and controlled cooling to ensure long service life and uniform surface microstructure.

Hydroclear™ Quench Oils have high Flash Points to minimize smoke and flash fires during quenching.

### **Applications**

Hydroclear™ Quench Oil 22 is a low-viscosity, straight paraffinic mineral oil with a slower quench speed and uniform cooling rate. It is water-white in color to allow easy visual inspection of the quenched parts. It provides minimum hardening power. Hydroclear™ Quench Oil 22 will discolor in service and its quench speed varies as it ages, due to presence of contaminants in the quench tank and continuous exposure to heat. Periodical maintenance and product sweetening restores its physical characteristics.

Hydroclear™ Quench Oil 22MS is a low-viscosity, amber-colored paraffinic oil containing quenching additives. It is recommended where medium quenching speeds are required. This allows uniform surface microstructure, while minimizing metal surface distortion. It provides moderate hardening power.

**Metal Heat  
Treating And  
Quenching Oil**

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Hydroclear™ Quench Oil 22HS is a low-viscosity, amber-colored paraffinic oil containing quenching additives. It is recommended for faster quenching applications, where it is important to develop high-maximum cooling rate after the boiling phase followed by a controlled cooling rate. This allows uniform surface microstructure, while minimizing metal surface distortion. It provides moderate-to-high hardening power.

Hydroclear™ Quench Oil 32HS is a higher-viscosity paraffinic oil than Quench Oil 22HS. It is amber-colored. It contains quenching additives, and it is recommended for faster quenching applications, where it is important to develop higher-maximum cooling rate after the initial boiling phase followed by a more controlled cooling rate. This allows uniform surface microstructure, while minimizing metal surface distortion. It provides the highest hardening power.

**Caution:** *Conoco Hydroclear™ Quench Oils must not be mixed with any other competitive quench oils. Agitation, filtration and periodic product sweetening are essential to successful quenching operations. The quench tanks must be periodically cleaned and the quench oil filtered to remove scale, metal shavings and contaminants. A 50-micron double-bag filter is recommended for proper maintenance. The quench oil must be continuously agitated to provide uniform surface microstructure. Condition monitoring by oil analysis is essential in maintaining optimum performance and desired quenching qualities of these oils.*

Hydroclear™ Quench Oils are not recommended for Marquenching™ or Martempering quenching operations, where oil temperatures can reach 150°C to 232°C (302°F to 450°F).

### **Outstanding Features**

- Controlled cooling of metal surface
- Reduced drag-out and oil consumption
- Uniform surface finish with minimum distortion
- Excellent thermal and oxidative stability
- High Flash Point reduces smoke and flash fires

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**Hydroclear™ Quench Oil**  
**Typical Properties**

Grade	ASTM				
	Test Method	22	22MS	22HS	32HS
API Gravity		33.3	33.0	32.6	31.9
Specific gravity @ 15.6°C		0.859	0.860	0.863	0.866
Density, lb/gal		7.16	7.18	7.19	7.22
Color	D1500	<0.5	1.5	L2.0	2.0
Flash Point (COC), °C (°F)	D92	205 (401)	207(405)	207(405)	218 (424)
Pour Point, °C (°F)	D97	-13 (+9)	-15 (+5)	-15 (+5)	-15 (+5)
Viscosity,	D445				
cSt @ 40°C		22.0	22.9	23.1	32.0
cSt @ 100°C		4.5	4.5	4.5	5.5
SUS @ 100°F		110	119	120	165
SUS @ 210°F		40	41	41	45
Viscosity Index	D2270	96	104	104	109
Total Acid Number	D664	0.01	0.09	0.05	0.05
Max Cooling Rate Range*,	D6200				
°F/sec		85-105	155-165	165-185	169-189
°C/sec		47-58	86-92	92-103	94-105
Time to Reach 1112°F (600°C), sec		12-15	9-12	9-10	9-10

*\* The cooling rates and quench times results are typical for new oil. For used oil, the values will vary. The values also may vary from lab to lab, depending on the repeatability and reproducibility of the ASTM test method.*

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