

## 76 Quench Oils

76 Lubricants Quench Oils are high-quality oils developed for heat treatment of ferrous metals in a wide variety of quenching operations. They are formulated to provide deep and uniform hardening with minimum distortion and cracking for a smooth surface finish.

Quench Oils are available in two grades: 1001 and 1021. The 1001 grade is a highly refined, straight (non-additized) paraffinic mineral oil recommended for conventional quenching of ferrous metals at bath temperatures up to 150°F (66°C). The 1021 grade is fortified with select additives that provide enhanced oxidation resistance and metal-wetting ability for use in fast quenching operations where it is important to develop maximum hardness while minimizing distortion.

Quench Oils provide a high initial cooling rate to induce maximum hardness. After the critical transformation temperature is passed, the cooling rate gradually decreases to a much slower rate to minimize the possibility of stress and metal distortion, thereby ensuring a smooth surface finish. These oils are highly stable throughout the hardening temperature range to provide long service life with minimal sludge formation. They have a high viscosity index for minimum viscosity change during the entire quenching operation, and have high flash and fire points to minimize fire hazards.

### **Applications**

- Conventional and fast quenching of ferrous metals, such as carbon steel, gray iron and high alloy steel

**Caution:** Quench Oils must not be mixed with competitive quench oils, unless tested for compatibility. They are **not** recommended for marquenching or martempering operations, where oil temperatures can reach 150°C to 232°C (302°F to 450°F).

### **Features/Benefits**

- Controlled cooling rate to minimize cracking and distortion
- Good surface finish
- Excellent oxidation resistance and thermal stability
- High flash point for safety

**Note:** Agitation, filtration and periodic product sweetening are essential to successful quenching operations. The quench tanks must be periodically cleaned

## Metal Quenching Oils

**Customer Service Number:**  
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**1-800-435-7761**

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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 the desired quenching qualities of these oils.

## 76 Quench Oils

### Typical Properties

Grade	1001	1021
<b>ISO Grade</b>	<b>15/22</b>	<b>15</b>
Density, g/cm <sup>3</sup> @ 15.6°C (60°F)	0.855	0.850
Density, lbs/gal @ 15.6°C (60°F)	7.12	7.08
Color, ASTM D1500	<0.5	8.0
Flash Point (COC), °C (°F)	210 (410)	168 (334)
Pour Point, °C (°F)	-12 (10)	-30 (-22)
Viscosity,		
cSt @ 40°C	19.4	16.0
cSt @ 100°C	4.0	3.7
SUS @ 100°F	103	86.6
SUS @ 210°F	39.7	38.7
Viscosity Index	103	117
Acid Number, ASTM D974, mg KOH/g	0.01	0.03
Cooling Characteristics <sup>(1)</sup> , ASTM D6200,		
Maximum Cooling Rate, °C/sec	47-58	94-106
Maximum Cooling Rate, °F/sec	85-105	170-190
Time to Cool to 600°C (1,112°F), seconds	12-15	8-10

<sup>(1)</sup> **Note:** Values for cooling rates and quench speeds are typical for new oil. For used oil, the values will vary due to aging and contamination.

### Health and Safety Information

For recommendations on safe handling and use of this product, please refer to the Material Safety Data Sheet via <http://w3.conocophillips.com/NetMSDS>.

Due to continual product research and development, the information contained herein is subject to change without notification.

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