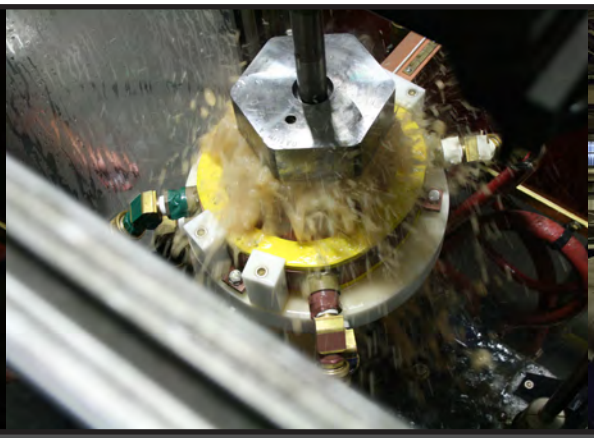
DOW® UCON QUENCHANT B

POLYMERIC QUENCHANTS



UCON Ouenchant B is an aqueous solution of a liquid organic polymer and corrosion inhibitors. The organic polymer used in UCON Ouenchant B is inversely soluble in water.

U92

UCON Ouenchant B is one of a series of nonflammable polymeric quenchants manufactured by Dow Chemical Company and sold by Tenaxol Technologies. UCON Ouenchant B is an aqueous solution of a liquid organic polymer and corrosion inhibitors. The organic polymer used in UCON Ouenchant B is inversely soluble in water. At ambient temperatures the polymer is completely soluble in water and produces clear homogeneous solutions. At temperatures above 74 ·c (165·F); however, the polymer separates from water as an insoluble phase.

When hot metal is quenched in a diluted solution of UCON Quenchant B, a film of the liquid organic polymer is deposited on the surface of the hot metal. The rate at which the metal is cooled is governed, in part, by the thickness of the polymer-rich film. The thick ness of this film is controlled by the concentration of UCON Ouenchant B in the quench bath.

The cooling rate is controlled also by adjusting the quench bath temperature and/or the rate of agitation. The main difference between UCON Ouenchant Band other UCON Quenchants is its higher molecular weight, which provides uni form heat transfer in the range of medium speed oils to slow oi ls.

CHEMTOOL INCORPORATED
TENAXOL TECHNOLOGIES

APPLICATIONS

- For the heat treatment of large alloy parts from til t-top and pit oxidizing and/or atmo- sphere
- furnaces that heretofore had required an oil quench
- With forged parts that are quenched directly from the forge
- Induction hardening of sensitive shapes and alloys
- In continuous furnace operations employing gas-fired and carburizing-carbonitriding atmospheres.

PERFORMANCE

UCON Quenchant B is used for carbon steel through 1095 grade alloy steels of most grades, including 400 series stainless steels.

UCON Quenchant B is readily adapted to induction hardening, both spray quench and immersion, for such items as gears, crankshafts, camshafts, and other pieces of intricate geometry and different metallurgy.

UCON Quenchant B may follow either oxidizing or protective atmosphere furnaces of shaker. rotary or continuous design. It may be used for direct quenching from the forge, for continuous cast quenching, and for general hardening of forged and cast steels and cast irons.

TOXICOLOGICAL PROPERTIES

UCON Quenchant B is a water solution of an organic polymer and an inorganic nitrite, which can be harmful if swallowed. Under typical conditions of use. it is further diluted with water. If the water were removed in quenching operations, the remaining polymer would degrade on contact with hot meial. The resulting fumes would be irritating. Design the equipment. therefore. to avoid splashing; provide adequate ventilation.

BENEFITS

- UCON Quenchant B has been approved by Factory Mutual Research Corporation as a "less-hazardous" quenchant. Opportunity is presented for reduced costs of protection equipment and/or fire insurance.
- The optimum operating conditions for a specific metal or par t may be determined by control of concentrations, bath temperature, and agitation.
- UCON Quenchant B produces slow "C" phase cooling due to its higher molecular weight ingredient. The major make-up requirement is for water lost by evaporation.
- UCON Quenchant B eliminates the smoke, soot, and residues common to oil quenchants. Equipment maintenance and plant cleanliness are easier to achieve.
- UCON Quenchant B is fully soluble in water. It is resistant to bacterial growth, exhibits low Biochemical Oxygen Demand (BOD}, and is essentially non-toxic to bluegill sunfish.

TYPICAL PHYSICAL PROPERTIES†

	UCON Quenchant B
Weight per Gallon at 2o·c	8.96
Specific Gravity at 2012o·c	1.077
Flash Point	None
Pour Point	o·c (32.F)
pH	8.5
Rust Inhibition. ASTM 0 665A	Pass
Viscosity at 1oo·F (37.s·c)	1.450 sus

†Typical physical properties, not to be construed as specifications

COOLING CURVES

Figures 1 and 2 illustrate the rate of cooling achieved with UCON Quenchant Bin laboratory tests using a stainless steel test cylinder (1" diameter by 4" long) fitted with a thermocouple at the geometric center. Figure 1 illustrates the influence of variations in concentration at constant temperature and agitation. Figure 2 illustrates the change in cooling rate at an elevated bath temperature, and again uniform agitation.

FIGURE 1
EFFECT OF CONCENTRATION ON COOLING RATE

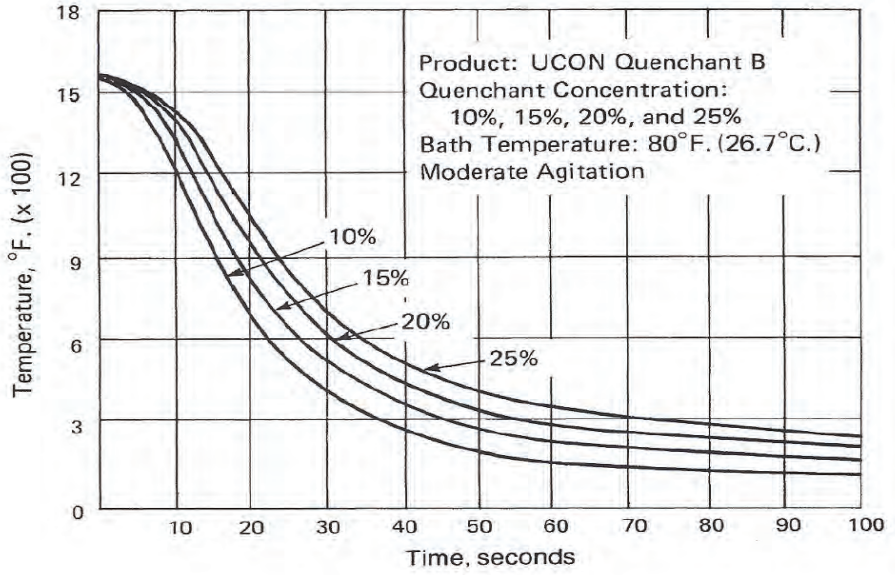
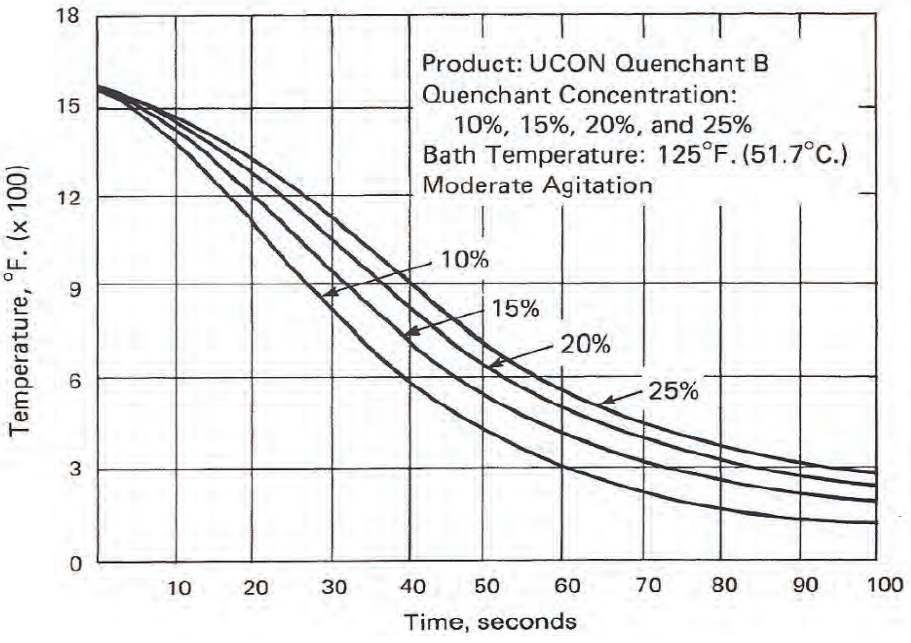


FIGURE 2
EFFECT OF ELEVATED BATH TEMPERATURE ON COOLING RATE



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THE PRODUCT

DOW® UCON QUENCHANT B

PRODUCT USE PRECAUTIONS

Steam and small amounts of organic vapors can be evolved during quenching. The vapors could be irritating and toxic if allowed to accumulate. Adequate workplace ventilation should be provided to prevent irritation and accumulation of vapors; this may require use of a special, local ventilation system in the immediate area where vapors are released.

Where this product is burned under conditions of relatively complete combustion. The major products are carbon dioxide and water vapor. Where this material is subjected to overheating (thermal degradation) but does not burn, the degradation products can be such things as organic acids (formic. acetic acids). aldehydes. esters. ketones, etc. These vapors or fumes can be highly irritating to the eyes. nose. and throat. Special ventilation may be needed. In normal use, no respiratory protective equipment should be needed, but self-contained breathing apparatus should be available for use in emergencies. Small amounts of organic vapors can be formed by oxidation of quenchants. These vapors could be irritating or toxic if released in a poorly ventilated area. Good ventilation should be maintained in the area around quench tanks.

PRODUCT STEWARDSHIP

Dow encourages its customers and potential users to review their applications from the standpoint of human health and environmental aspects. To help ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel will assist customers in dealing with environmental and product safety considerations. Dow literature, including Material Safety Data Sheets. should be consulted prior to the use.

HEALTH AND SAFETY

- Please consult the latest Safety Data Sheet for recommended safe handling and use of this product.

SHIPPING AVAILABILITY

UCON QUENCHANT B (#1423600000) is available in:

- 35 pound pails
- 120 pound kegs
- 400 pound drums
- Bulk quantities

CHEMTOOL INCORPORATED IS THE N. AMERICAN SUPPLIER OF UCON QUENCHANT

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Call 815-957-4140 or go to www.tenaxol.com

Chemtool, Inc. ⬡ Corporate Technology Center ⬡ 801 W Rockton Road, Rockton, IL 61072
Phone: 815-957-4140 ⬡ Fax: 815-624-0381