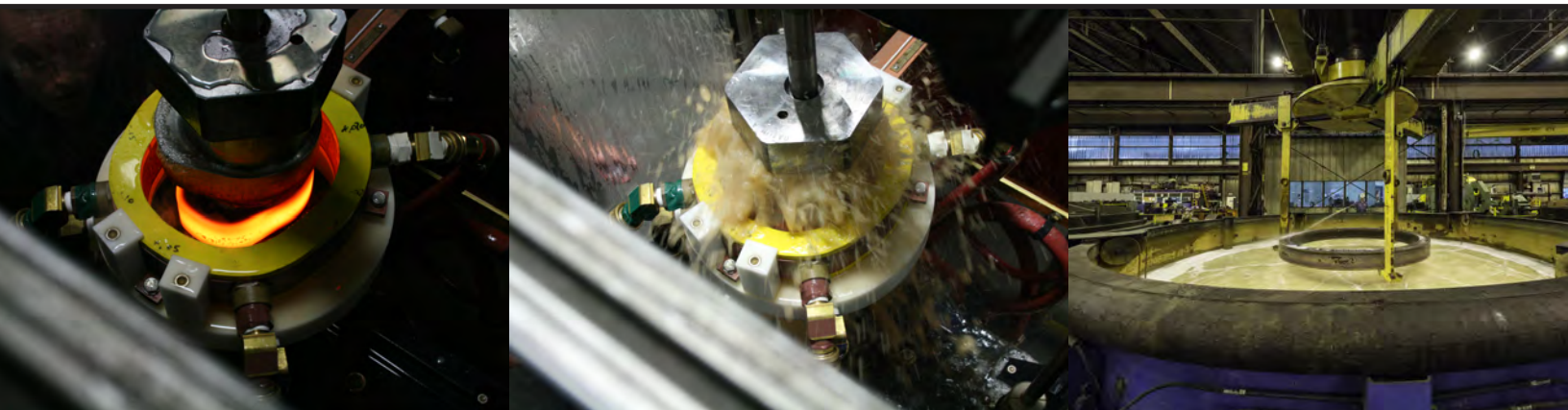




DOW® UCON QUENCHANT RL & RL-NN

POLYMERIC QUENCHANTS



UCON™ Quenchant RL and RL-NN are nonflammable polymeric quenchant s manufactured by The Dow Chemical Company. They are an aqueous solution of a liquid organic polymer and a corrosion inhibitor. The organic polymer is soluble in water and produces a homogenous solution. At temperatures above 74°C (165°F), however, the polymer separates from water as an insoluble phase.



UCON Quenchant RL-NN is formulated with a proprietary non-nitrite corrosion inhibitor which is completely compatible with UCON Quenchant RL without nitrosamine formation. Analogous quenching performance is obtained with either UCON Quenchant RL or RL-NN.

When hot metal is quenched in a diluted solution of UCON Quenchant RL or RL-NN, 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 thickness of this film is controlled by the concentration of UCON Quenchant RL or RL-NN in the quench bath.

The cooling rate is controlled also by adjusting the quench bath temperature and/or the rate of agitation. The major difference between UCON Quenchant RL and RL-NN and the other UCON Quenchants is the polymer composition, which provides uniform heat transfer in a broad range of applications.

APPLICATIONS

- Large alloy parts form tilt-top, car-bottom and pit furnaces
- Forged parts that are quenched directly from the forge
- Sensitive shapes and alloys heated by induction
- Parts processed from continuous and batch-furnace operations employing gas-fired, neutral, and carburizing-carbonitriding atmospheres.





PERFORMANCE

UCON Quenchant RL and RL-NN are used for quenching of medium- to high-carbon steel and alloy steels of most grades including 300 and 400 series stainless steels. UCON Quenchant RL and RL-NN are readily adapted to induction hardening, camshafts, and other pieces of intricate geometry and different metallurgy. UCON Quenchant RL and RL-NN may follow oxidizing, neutral, or protective atmosphere furnaces of shaker, rotary, batch or continuous design. The quenchant 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.

BENEFITS

- FM approvals has classified UCON Quenchant RL and RL-NN as “FM Approved” as tested against the latest testing criteria.
- The optimum operating conditions for a specific metal or part may be determined by control of concentration, bath temperature, and/or agitation.
- UCON Quenchant RL and RL-NN minimize replacement control due to its low deterioration and/or oxidation rate. The major make-up requirement is for water lost by evaporation.
- UCON Quenchant RL and RL-NN eliminate the smoke, soot, and residues common to oil quenchants. Equipment maintenance and plant cleanliness are easier to achieve.
- UCON Quenchant RL and RL-NN are fully soluble in water and resistant to bacterial growth.
- UCON Quenchant RL and RL-NN will freeze below 0°C (32°F). They should be thawed to room temperature and mixed before use. The product will not be affected in any way.

TYPICAL PHYSICAL PROPERTIES†

	UCON Quenchant RL	UCON Quenchant RL-NN
Weight per Gallon @ 20°C	8.97	8.77
Specific Gravity at 20/20°C	1.077	1.073
Flash Point, Cleveland Open Cup, ASTM D 92	None	None
Pour Point, °C (°F)	0 (32)	<0 (<32)
Rust Inhibition, ASTM D 665A	Pass	Pass
Viscosity at 100°F (37.8°C), SUS	1000 - 1250	1060 - 1300

†Typical physical properties, not to be construed as specifications

COOLING CURVES

Figures 1 and 2 illustrate the rate of cooling achieved with UCON Quenchant RL in laboratory tests using a 750 mm x 12.5 mm (dia.) Inconel probe fitted with a Type K thermocouple. Figure 1 illustrates the influence of variations in concentration at constant temperature and agitation. Figure 2 illustrates the change in cooling rate at elevated bath temperatures, again, with uniform agitation. UCON Quenchant RL-NN will yield equivalent results.

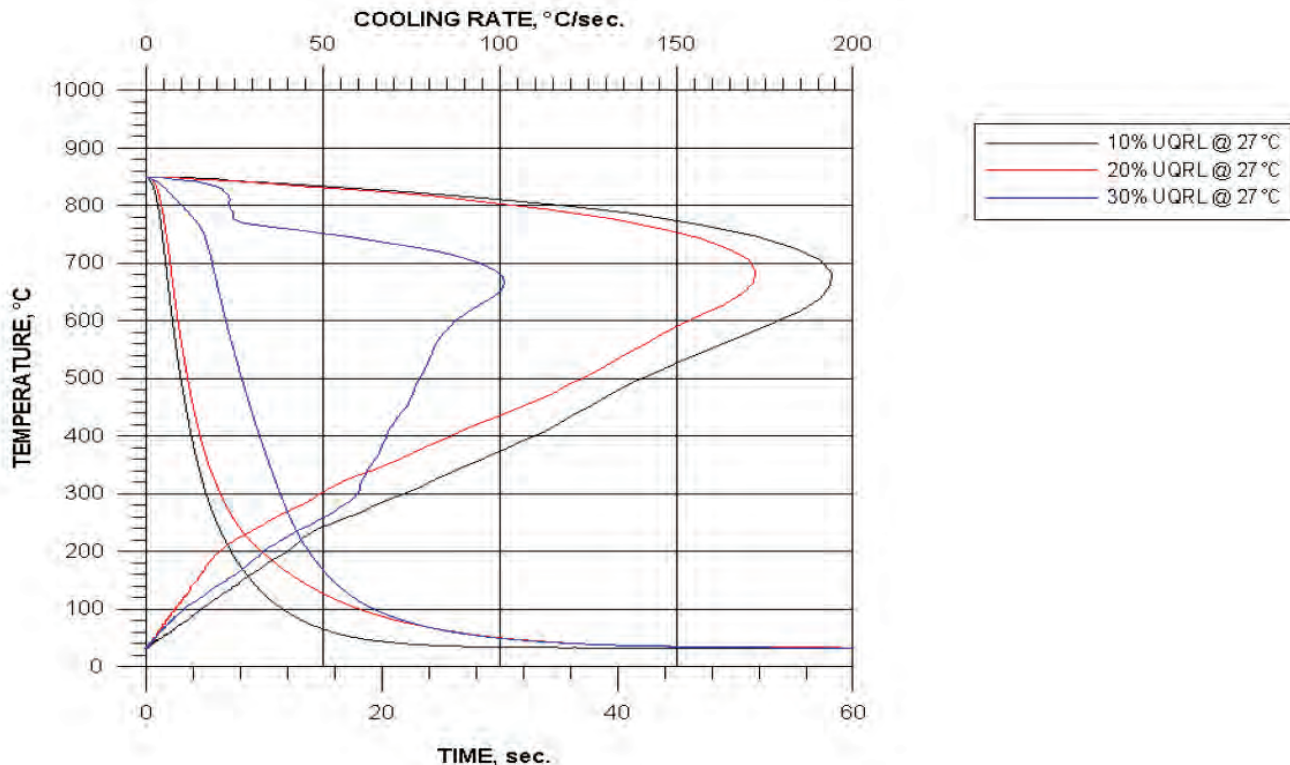


Figure 2 ● Temperature Effect on Cooling and Cooling Rate for UCON™ Quenchant RL
Agitation Rate = 15 L/min.





THE PRODUCT

DOW® UCON QUENCHANT HT

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 quenchant. 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 RL and RL-NN (#1422090000 and 1422800000) 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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