

PRODUCT DATA

AQUA-QUENCH[®] 251

**AN OIL-FREE, NON-FLAMMABLE, WATER SOLUBLE SYNTHETIC
QUENCHANT FOR THE HARDENING OF FERROUS ALLOYS**

DESCRIPTION

Aqua-Quench 251 is a concentrated aqueous solution of poly-oxyethylene glycol. **Aqua-Quench 251** is inversely soluble in water and is inhibited against ferrous and non-ferrous corrosion. The flexibility of concentration enables the user to obtain quench rates as fast as water, slower than oil, or anywhere in between. Its non-flammability and drastic reduction in fumes allow for safer and cleaner working environments.

TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Appearance	Light amber, slightly hazy
Viscosity @ 100°F (37.8°C)	
Neat	280+/- 25 cSt
5%	1.2 cSt
10%	1.8 cSt
20%	4.4 cSt
30%	8.9 cSt
Specific Gravity @ 60°F (15.6°C)	1.08
Pounds per (U.S.) Gallon @ 60°F (15.6°C)	9.0



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TYPICAL PHYSICAL & CHEMICAL PROPERTIES (Cont'd)

Kilograms per Liter @ 60°F (15.6°C)	1.08
pH Value	9.5 +/- 0.5
Corrosion Protection	Excellent, even in 5% aqueous solutions
Solubility in Water	Inverse - insoluble in water at all temperatures above 165°F (73.9°C).

FEATURES AND BENEFITS

- One drum of **Aqua-Quench 251** can replace 5 to 10 drums of quench oil, thus reducing storage space.
- Lower material handling and freight costs.
- Variable cooling rates by changing concentrations.
- Eliminates the fire hazard and smoke associated with quenching oils.
- Reduced or eliminated fire fighting equipment cost.
- Lower housekeeping and insurance costs.
- Lower pollution potential.
- Cleaner parts after the hardening operation.

APPLICATIONS

Aqua-Quench 251 is used for the hardening of ferrous forgings, castings and stampings. **Aqua-Quench 251** can be used in open quench tanks, continuous furnaces, integral quench furnaces and selective or surface hardening equipment. Listed below are some typical applications where **Aqua-Quench 251** can be utilized to replace oil quenchants or improve existing quenching operations.

Forgings

Steel forgings ranging in size from a few pounds to several tons with alloy composition from low to high hardenabilities can be hardened in **Aqua-Quench 251**. Concentrations of product varies with alloys. The typical range is 10% to 30% **Aqua-Quench 251**.

Castings

Steel castings, as far as size and alloy, are similar to forgings and are heat treated in the same manner. **Aqua-Quench 251** can be used for these castings and concentration, again, ranges from 10% to 30%, depending on alloy and casting configuration.

Nodular and ductile iron castings are usually quenched in 15% to 25% solutions of **Aqua-Quench 251**.

Surface Hardening

Gears, spindles, camshafts, bearing journals, etc. are many times surface hardened by flame or induction. **Aqua-Quench 251** is an excellent substitute for quenching oils in this application, eliminating oil smoke and chance of fire.

The above applications are examples. The actual solution concentrations of **Aqua-Quench 251** will vary depending on the workpiece, chemistries, dimensions, equipment being used, etc.

CONCENTRATION CONTROL

A sugar refractometer can be used for in-shop concentration control of **Aqua-Quench 251** solutions. The factor to be used with the sugar refractometer is 2.5 for new solutions. The concentration for new **Aqua-Quench 251** solutions is determined by multiplying the refractometer reading by the factor. As polymer quenchant solutions are used, they become contaminated. This contamination in time will affect the solution's refractometer reading, making the solution concentration obtained by the sugar refractometer erroneous.

Therefore, we recommend a periodic solution concentration check by Kinematic Viscosity. The periodic concentration check by Kinematic Viscosity is routinely performed in our Valley Forge Technical Center free of charge to our customers.

CLEANING

Due to the inverse solubility of **Aqua-Quench 251**, parts quenched in **Aqua-Quench 251** solutions will have a polymer film covering them. This polymer film is easily removed by rinsing the quenched part in plain cold water.

Parts that have been tempered before cleaning may require longer cleaning cycles to remove the dried-on polymer film.

STORAGE INFORMATION

Aqua-Quench 251 is unaffected by freezing and thawing. If stored outside at cold (below freezing) temperatures, bring to room temperature and roll the drum to insure that all materials are properly mixed before using. Avoid using strong oxidizers.

SHELF LIFE

Under normal conditions the recommended shelf like for **Aqua-Quench 251** is twelve (12) months.

SHIPPING INFORMATION

Aqua-Quench 251 is shipped in 55 (U.S.) gallon (208 liter) steel drums and in bulk.

SHIPPING CLASSIFICATION

Compound, Metal Annealing or Tempering N.O.S.

STORAGE/HANDLING/DISPOSABILITY

No health or safety hazards exist when **Aqua-Quench 251** is stored, used and disposed of in accordance with instructions given on the Material Safety Data Sheet for this product.

WARRANTY

The information given here is considered to be correct and is offered for your consideration, investigation and verification. No warranties are expressed or implied since the use of our products is beyond our control. Statements concerning the use of Houghton products are not to be construed as recommending the infringement of any patent.

EXPORT STATEMENT

This commodity and its technology are subject to the export control laws and regulations of the United States Government. Buyer agrees that it shall not make any disposition, by way of export, diversion, transshipment, re-export or otherwise, except as expressly permitted under United States law.

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