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## TYPICAL PHYSICAL & CHEMICAL PROPERTIES

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

## FEATURES AND BENEFITS

- \* One drum of Lotos quench 311 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

Lotos quench 311 is used for the hardening of ferrous forgings, castings and stampings. Lotos quench 311 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 Lotos quench 311 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 Lotos quench 311. Concentrations of product varies with alloys. The typical range is 10% to 30% Lotos quench 311.

## **Castings**

Steel castings, as far as size and alloy, are similar to forgings and are heat treated in the same manner. Lotos quench 311 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 Lotos quench 311.

## **Surface Hardening**

Gears, spindles, camshafts, bearing journals, etc. are many times surface hardened by flame or induction. Lotos quench 311 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 Lotos quench 311 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 Lotos quench 311 solutions. The factor to be used with the sugar refractometer is 2.5 for new solutions. The concentration for new Lotos quench 311 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.

## **CONCENTRATION CONTROL**

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 Lotos quench 311, parts quenched in Lotos quench 311 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**

Lotos quench 311 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 Lotos quench 311 is twelve (12) months.

## **SHIPPING INFORMATION**

Lotos quench 311 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 Lotos quench 311 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 Lotos 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.

