



Thermo-Quench

DuBois

Nitrite/Nitrate Based Salt Used for Quenching & Tempering

DESCRIPTION:

THERMO-QUENCH is a eutectic nitrate/nitrite granular salt mixture that can be used for interrupted or isothermal quenching of austenitized steels. These processes include such heat-treating applications as Austempering, Martempering, or Marquenching. Also, THERMO-QUENCH is suitable for tempering or "drawing" hardened steels.

THERMO-QUENCH is chemically and thermally stable when used within its working range, exceptionally fluid, completely water soluble and has high thermal conductivity. Liquidity (drag-out) at 400°F is approximately 0.065 grams per square inch. The organic anti-caking agent incorporated into THERMO-QUENCH can interfere with the ability of water additions to increase the molten salt's quench severity. To prevent this possibility, it is recommended to use THERMO-QUENCH W/O.

THERMO-QUENCH can be used as a quench from any austenitizing medium, except cyanide-base salts. It is not advisable to quench steel parts from temperatures above 1650°F into THERMO-QUENCH unless the parts are small and separated. For parts austenitized at temperatures > 1650°F, a neutral bath at an intermediate temperature may be employed as a stabilizing medium before the isothermal quench in salt.

PHYSICAL PROPERTIES:

Melting Point	288°F
Working Range	300 - 1100°F
Density	120 lbs./ft. ³ @ 400°F
Specific Heat	0.36
Appearance	Pink
Anti-Caking Agent	Present
Vapor Pressure	NIL
Specific Gravity	1.84 – 1.92

EQUIPMENT:

Plain steel pots are suitable for use with THERMO-QUENCH for temperatures up to 850°F. For continuous use at temperatures above 850°F alloy pots should be used, particularly in externally fired or radiant tube furnaces.

OPERATION:

To start a new bath, begin by measuring the volume of the salt bath in cubic feet remembering to leave several inches of freeboard at the top of the bath. Multiply this volume by 120 pounds/cubic feet to obtain the number of pounds of salt needed.

Parts to be treated should be clean and dry. All measures should be in place to avoid contaminating THERMO-QUENCH with oils, cleaning compounds, rust preventatives, or general soils. Organic materials burn in molten THERMO-QUENCH. The presence of any carryover of THERMO-QUENCH into neutral chloride salts must also be rigorously avoided. This material tends to destroy the neutrality of molten chloride salts and is also harmful to the furnace fixtures and linings.

CONTROL:

Where THERMO-QUENCH is used as a quenching medium for steel parts heated in air or atmosphere furnaces, replacement of drag-out is the only maintenance usually required. In some cases where scale, soot or other foreign materials are brought into the bath on austenitized parts or on fixtures, sludging may be necessary. All baskets and fixtures quenched into THERMO-QUENCH should be thoroughly cleaned before going back into neutral salt or atmosphere austenitizing furnaces. When carry-over of a neutral salt exceeds the capacity of THERMO-QUENCH to dissolve it, sludge will develop. This sludge may be removed by sludging. Reduction of temperature precipitates excess neutral salts so that they may be removed more effectively.

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SAFE HANDLING & STORAGE CONDITIONS:

Extreme caution should be used in the handling of molten salts. Proper protective equipment should be worn. All efforts should be made to protect workers during additions and introduction of work into the bath to avoid splashing of molten salt. All parts and fixtures introduced to the bath must be completely dry to avoid splattering of hot salt from the rapid evaporation of water or other liquids on the parts.

Contamination of THERMO-QUENCH with cyanide salts must be avoided; such contamination can result in violent reaction and explosion. The introduction of carbonaceous material, such as oils, will cause an increase in sludge formation. Gases, generated as the salt remelts, particularly in bottom-fired furnaces, sometimes displace the un-melted top layers of salt and cause splattering. Properly designed furnaces preclude this possibility, but a sheet metal cover over the top of the furnace will prevent any trouble. A tapered metal plug, inserted in the bath before re-solidification, can be removed later to provide an opening for gas release and the expansion of the molten salt during the remelting.

THERMO-QUENCH should not be heated to temperatures exceeding 1100°F to avoid rapid decomposition which could lead to release of toxic oxides of nitrogen gases and a possible explosion can result.

Before handling, the Safety Data Sheet (SDS) should be read and understood by all personnel in contact with this product. General indoor storage at room temperature is recommended.

DISPOSAL:

Any disposal of this product needs to be in compliance with all federal, state, and local regulations. Please refer to the Safety Data Sheet (SDS) for instructions regarding proper disposal of this product.

PRECAUTIONS:

KEEP OUT OF THE REACH OF CHILDREN.

Please refer to the label and Safety Data Sheet (SDS) for all warnings, recommendations for safety equipment, and other regulatory information. Copies of the SDS can be ordered by calling 800-438-2647.

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