

TECHNICAL DATA SHEET

AQUA-QUENCH® 245

ADVANCED BIO-STABLE POLYMER QUENCHANT FOR INDUCTION AND IMMERSION HARDENING APPLICATIONS

AQUA-QUENCH 245 is an advanced bio-stable polymer quenchant designed for induction hardening and immersion quenching applications, and represents another breakthrough in technology from Houghton International.

AQUA-QUENCH 245 is a polymer quenchant formulated with a combination of ingredients that provide greater stability to microbial intrusion of the quenchant. Many of today's induction hardening applications require the use of polymer quenchants on a wide variety of parts. Unfortunately due to production requirements, parts may not be washed prior to heat treatment and pre-heat treatment process fluids such as machining coolants, rust preventives, and cleaners can contaminate the quench tank. These products can cause degradation of the quenchant.

Applications

AQUA-QUENCH 245 is specifically designed for use in induction and immersion hardening applications to minimize residual sticky deposits on equipment and quenched parts, and extend system life.

The quenching speed of AQUA-QUENCH 245 solutions can be selected to suit the steel hardenability and components requirements by varying the concentration of the solution.

Benefits

- Bio-stable technology to extend system life, minimize recharging and increased production
- Designed for induction hardening applications: Minimizes residual sticky deposits on equipment and quenched parts provide cleaner operations and prevents blockage of spray nozzles and filters
- Uniform quenching eliminates steam pockets and formation of soft spot associated with water quenching
- Water based quenchant to eliminate fire hazard and smoke associated with quenching oils along with cleaner parts and safer working environment

Health, Safety and Handling

Please consult the Safety Data Sheet (SDS) for information on storage, safe handling and disposal. The conditions or methods of handling, storage, use and disposal of the product are beyond our reasonable control - we assume no liability for any ineffectiveness of the product or any injury or damage, arising out of or in connection with these conditions.

Typical Physical Properties

PROPERTY	TYPICAL VALUE
Appearance	Clear to slightly Hazy Amber Fluid
Kinematic Viscosity @ 100°F (37.8°C)	195 cSt
Specific Gravity @ 60°F (15.6°C)	1.07

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TECHNICAL DATA SHEET

AQUA-QUENCH® 145

ADVANCED BIO-STABLE POLYMER QUENCHANT FOR INDUCTION HARDENING APPLICATIONS

AQUA-QUENCH® 145 is an advanced bio-stable polymer quenchant designed for induction hardening and immersion quenching applications, and represents another breakthrough in technology from Quaker Houghton.

Applications

AQUA-QUENCH® 145 is a polymer quenchant formulated with a combination of ingredients that provide greater stability to microbial intrusion of the quenchant. Many of today's induction hardening applications require the use of polymer quenchants on a wide variety of parts. Unfortunately due to production requirements, parts may not be washed prior to heat treatment and pre-heat treatment process fluids such as machining coolants, rust preventives, and cleaners can contaminate the quench tank. These products can cause degradation of the quenchant.

AQUA-QUENCH® 145 is specifically designed for use in induction and immersion hardening applications to minimize residual sticky deposits on equipment and quenched parts, and extend system life. The quenching speed of AQUA-QUENCH® 145 solutions can be selected to suit the steel hardenability and components requirements by varying the concentration of the solution.

Benefits

- Bio-stable technology to extend system life, minimize recharging and increased production
- Designed for induction hardening applications: Minimizes residual sticky deposits on equipment and quenched parts provide cleaner operations and prevents blockage of spray nozzles and filters
- Water based quenchant to eliminate fire hazard and smoke associated with quenching oils along with cleaner parts
- Uniform quenching eliminates steam pockets and formation of soft spot associated with water quenching

Health, Safety and Handling

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Properties

PROPERTY	TYPICAL VALUE	UNIT
Appearance	Clear to slightly hazy amber liquid	
Kinematic Viscosity at 100°F (37.8°C)	120 - 145	cSt
pH at 10%	10	
Specific Gravity at 60°F (15.5°C)	1.06	
Refractometer Factor	2	

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TECHNICAL DATA SHEET

HOUGHTO-QUENCH® K

HIGH PERFORMANCE, HIGHLY ACCELERATED COLD QUENCHING OIL

HOUGHTO-QUENCH® K is an accelerated quenching oil suitable for use at temperatures up to 180°F (82°C). It is based upon specialty solvent refined paraffinic base oil to minimize oxidation and ensure consistent performance under the most arduous of operating conditions. A carefully formulated additive package is incorporated into HOUGHTO-QUENCH® K to reduce the duration of the vapor blanket cooling stage and provide accelerated quenching characteristics, together with excellent oxidation resistance and thermal stability.

Applications

The highly accelerated speed provided by HOUGHTO-QUENCH® K enables the development of optimum strength and hardness with minimum distortion in lower hardenability and low alloy steels, heavy sectioned components or steels of borderline hardenability.

Recommendation for Use

HOUGHTO-QUENCH® K is suitable for use in all types of quenching installations including open quench tanks, sealed quench furnaces and continuous furnaces of the shaker hearth, cast link and mesh belt type. It is recommended particularly for applications where staining of components during quenching should be minimized.

Typical operating temperatures are 140°F (60°C) to 180°F (80°C).

Rule of thumb = one gallon of quench oil for every pound of parts/fixtures.

Benefits

- Fast cooling rate in initial stage of quenching: Maximum metallurgical and physical properties
- Minimal drag-out of quenching oil: Less smoke and makeup required
- Excellent oxidation resistance and thermal stability: elimination of waste due to quench oil degradation

Health, Safety and Handling

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Properties

PROPERTY	TYPICAL VALUE	UNIT
Kinematic Viscosity at 100°F (37.8°C)	77 15.0	SUS cSt
Flash Point (minimum)	345 174	°F °C
Specific Gravity at 60°F (15.6°C)	0.86	
GMQS at 80°F (26.7°C) (ASTM D-3520)	7 - 9	seconds

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TECHNICAL DATA SHEET

QH DRAWTEMP™ 430

FORMERLY DRAW-TEMP® 430

WIDE MELTING RANGE SALT SUITABLE FOR THE SOLUTION HEAT TREATMENT OF NON-FERROUS ALLOYS AND TEMPERING OR AUSTEMPERING OF STEEL

QH DRAWTEMP™ 430 is mainly for heat treating aluminum alloys. It is also used for tempering steel at bath temperatures up to 1000°F (537.8°C) and for stress relieving and annealing nonferrous metals. Caution: Do not use this product with magnesium, lead, tin, zinc or aluminum-magnesium alloys, containing more than 2% magnesium.

Applications

QH DRAWTEMP™ 430 is an efficient salt for rapidly and uniformly heating thin and thick metal sections and the even heat extraction of austenitized parts. This eutectic salt is mainly used where a low melting point, low viscosity fluid is needed for rapid heating of non-ferrous alloys or control of the cooling rates in the hardening of ferrous alloys.

Recommendation for Use

Used neat as supplied.

Health, Safety and Handling

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The Benefits

- Greater stability - According to National Board of Fire Underwriters: "Salt mixtures produce higher boiling and decomposition temperatures than single salts."
- Controls the danger of intergranular corrosion, allowing full tensile properties as required
- Rapid heat transfer properties give uniform bath temperatures
- Rapid heating of alclad alloys minimizes time for diffusion of alloy into alclad. This permits the alclad to retain its corrosive resistance property

Properties

PROPERTY	TYPICAL VALUE	UNIT
Appearance	White, crystalline, granular salt	
Melting Point	430 221.1	°F °C
Decomposition Point	1200 648.9	°F °C
Working Range		
Aluminum	500-1000 260-537.8	°F °C
Copper	500-1100 304.4-5	
Ferrous	500-1100 260-593.3	
Specific Heat, Liquid	0.38	

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TECHNICAL DATA SHEET

AQUA-QUENCH® 251

POLYMER QUENCHANT FOR THE SOLUTION HEAT TREATMENT OF ALUMINIUM ALLOYS

AMS 3025 E TYPE 2

AQUA-QUENCH® 251 is a pale amber coloured fluid concentrate based upon polyalkylene glycol. It mixes readily with water to produce a solution, which is instantly ready for use. As AQUA-QUENCH 251 solutions are heated the organic polymer becomes insoluble in the water at temperatures above 74°C. When the solution is cooled the polymer goes back into solution and is fully miscible. It is this property known as "inverse solubility" which imparts the unique cooling mechanism to AQUA-QUENCH 251.

Applications

AQUA-QUENCH® 251 is a versatile water soluble polymer quenchant for use in the solution heat treatment of aluminium alloys. The flexibility of quenching speed and uniform heat transfer characteristics of AQUA-QUENCH 251 eliminates many of the disadvantages of water or mineral oil based quenchants.

AQUA-QUENCH 251 complies with Aerospace Material Specification (AMS) 3025(E) as a Type 2 multiple Polymer quenchant. AQUA-QUENCH 251 can be used for processing a wide range of aluminium alloys such as 2024, 6061 and 7075 and is suitable for cast and forged components, extruded sections, brazed fabrications and assemblies manufactured from thin gauge sheet

Recommendation For Use

Use diluted in water.

The concentration of the AQUA-QUENCH® 251 solution influences the thickness of the polymer film which is formed on the surface of the component and hence controls the quenching speed. As the concentration increases, thicker films are produced thereby reducing the quenching speed and giving lower maximum cooling rates

Benefits

- **Economic**
 - Provides uniform heat transfer characteristics
 - Minimize distortion and provides excellent dimensional control
 - Eliminates steam pockets, uneven heat transfer, high residual stress and stress corrosion cracking associated with water quenching
 - Eliminates needs for heating of quench tanks
 - Provides flexibility of quenching speed
 - Low drag out in use
- **Operator friendly**
 - Eliminates smoke fumes associated with oil quenching
 - Boron and formaldehyde-releasing biocides free
- **Safety** - Eliminates fire hazard

Health, Safety And Handling

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Typical Physical Properties

PROPERTY	TYPICAL VALUE	UNIT
Concentrate Appearance	Translucent fluid	Visual
Specific Gravity @ 15.5°C	1.077	
Kinematic Viscosity @ 40°C	280	ASTM D445, mm ² /s
pH @ 10%	8	INTERNAL
Refractometer factor	2,6	INTERNAL

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TECHNICAL DATA SHEET

HOUGHTO-QUENCH® 105

HIGH PERFORMANCE, MODERATELY ACCELERATED COLD QUENCHING OIL

HOUGHTO-QUENCH® 105 is a moderately accelerated quenching oil suitable for use at temperatures up to 180°F (82°C). It is based upon specialty solvent refined paraffinic base oil to minimize oxidation and ensure consistent performance under the most arduous of operating conditions. A carefully formulated additive package is incorporated into HOUGHTO-QUENCH® 105 to reduce the duration of the vapor blanket cooling stage and provide accelerated quenching characteristics, together with excellent oxidation resistance and thermal stability.

Applications

Cold quenching oil applications for medium to high hardenability steels. It is designed for both general purpose and salt bath quenching applications. It is suitable for use in open quench tanks, sealed quench furnaces and continuous furnaces of the shaker hearth, cast link and mesh belt type. HOUGHTO-QUENCH® 105 is formulated to provide maximum economy in use, has uniform quenching characteristics and is suitable for use where moderate speed quenching characteristics are required.

Recommendation for Use

HOUGHTO-QUENCH® 105 is suitable for use in all types of quenching installations including open quench tanks, sealed quench furnaces and continuous furnaces of the shaker hearth, cast link and mesh belt type. It is recommended particularly for applications where staining of components during quenching should be minimized. Typical operating temperatures are 140°F (60°C) to 180°F (80°C). Rule of thumb = one gallon of quench oil for every pound of parts/fixtures.

The Benefits

- Increased cooling rate in initial stage of quenching
- Maximum metallurgical and physical properties
- Minimal drag-out of quenching oil
- Less smoke and makeup required
- Excellent oxidation resistance and thermal stability

Health, Safety and Handling

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Properties

PROPERTY	TYPICAL VALUE	UNIT
Kinematic Viscosity at 100°F (37.8°C)	110 23	SUS cSt
Flash Point (min)	345 174	°F °C
Specific Gravity at 60°F (15.6°C)	0.89	
GMQS at 80°F (26.7°C) (ASTM D-3520)	13 - 15	seconds

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