

# AQUA-QUENCH 251

Polymer Quenchant for the solution heat treatment of aluminium alloys  
AMS 3025 C Type 2

## DESCRIPTION

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(C) 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

## TYPICAL PHYSICAL PROPERTIES

Concentrate Appearance	Translucent fluid	Visual
Specific Gravity @ 15.5°C	1.077	
Kinematic Viscosity @ 40°C in mm <sup>2</sup> /s	255	ASTM D445
Water content %	60	
Refractive Index @20°C	1.3939	INTERNAL
Kinematic Viscosity @ 40°C in mm <sup>2</sup> /s	4	ASTM D 445 @ 20%
Specific heat in Cal/gm°C	0.95	INTERNAL @ 20%
Cloud point in °C	75	INTERNAL @ 20%
Refractometer Factor	2.58	INTERNAL

## BENEFITS

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

## 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

## RELATED PRODUCTS

Product is compatible with the full range of Houghton's portfolio. For more information, please contact your local Houghton representative.

## STORAGE

Please refer to section 7 of Safety Data Sheets for handling and storage information, including product shelf life. Product should be stored under cover in clean, dry conditions and protected from frost. Recommended storage temperature is usually between 5°C and 40°C unless otherwise specified. Use stock in delivery rotation.

## HEALTH AND SAFETY

Safety data sheets are available in accordance with Regulation (EC) No 1907/2006 Annex II where a substance or preparation meets the criteria in accordance with Directives 67/548/EEC or 1999/45/EC.



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## COOLING CURVE

