400 Quench Oil

Accelerated Quenching Oil

DESCRIPTION:

400 QUENCH OIL is designed to provide maximum cooling rates for austenitized steels. It is a version of AAA QUENCH OIL but with additional accelerator package in its formula. Its formulation guarantees good stability which will not stratify out at any temperature, nor can it be filtered out. 400 QUENCH OIL can be used as a quench from temperatures as high as 1750°F and is especially suitable for developing maximum oil-quenched hardness in medium and low alloy steels. It is particularly useful when quenching parts with very high surface area to mass ratios such as with fasteners. In cases like this, using 400 QUENCH OIL will reduce or eliminate the need for additions of QUENCH OIL ACCELERATOR. It is widely used as a quenching medium for carburized and carbonitrided work as well.

400 QUENCH OIL is known as a fast quench oil, achieving rapid cooling rates in the nucleate boiling stage immediately following a short vapor phase. It also provides a slower cooling rate through the martensitic transformation range (M_s - M_f) than competitor's fast quench oils. This ensures higher and deeper hardness levels are created without accompanying distortion of parts. Testing demonstrates 400 QUENCH OIL's superior heat removal characteristics are the difference between partial and complete hardening in actual practice.

Overall, distortion in oil quenched parts is proven to be caused by sluggish, non-uniform cooling rates. This is due to the thermal variations and mixed microstructures in the initial stages of the quench which slower quench oils produce. A fast uniform quench is especially important in batch-type carbonitriding furnaces to provide all portions of the load becoming evenly hardened. The quenching rate provided by 400 QUENCH OIL was designed to satisfy this requirement. Additionally, this low viscosity quench oil drains off parts quickly resulting in less drag-out and is characteristically easier to wash off work after quenching. If left on, it provides a thin film of protection from rust.

You can use 400 QUENCH OIL with confidence. Your parts will achieve maximum oil quenched hardness with minimum distortion or cracking. Lastly, 400 QUENCH OIL will produce exceptionally clean, bright work when used within its recommended temperature range.

TECHNICAL DATA:

Appearance:	Clear, gold colored oil.
Viscosity at 40 °C:	16.0 – 24.0 cSt (typical)
Flash Point:	≥ 171 °C (340 °F)
Nickel Ball Time:	9 - 11 sec
Anti-Oxidation Agent:	Present

BATH PARAMETERS:

Temperature:	77 – 180 °F (25 – 82°C) Open tank operation 200 °F (93 °C) Max. Under protective atmosphere
Velocity:	> 100 FPM (0.5 MPS)
Time:	As required for appropriate metallurgical transformation

EQUIPMENT:

All equipment for 400 QUENCH OIL baths may be constructed of mild steel.

Electrical immersion heaters used to raise the temperature of the oil should not exceed 10.0 watts per square inch, in a well agitated environment.

CONTROL:

The quenching speed of 400 QUENCH OIL can be obtained through testing by DuBois Chemicals. Test method ASTM D6200 - Standard Test Method for Determination of Cooling Characteristics of Quench Oils by Cooling Curve Analysis is performed on as-used 400 QUENCH OIL samples submitted by customers. If the quenching speed becomes slower resulting in lower hardness levels, a 5% addition of QUENCH OIL ACCELERATOR by volume of the quench system will restore the speed, increase hardness levels, and reinforce the anti-oxidizing agent in the as-used oil.

400 QUENCH OIL may need centrifuging or filtering

CONTROL:

depending on sediment that is dragged in. Sediment level should be maintained at ≤ 0.5% by volume.

Absorption of furnace atmosphere can cause the flash point to lower, resulting in poor quench characteristics and fire hazard. De-gassing at 250°F with agitation, under protective atmosphere will remove the contamination.

All efforts should be made to avoid water contamination of 400 QUENCH OIL. Water will cause very erratic quench characteristics as well as posing a serious fire hazard.

SAFE HANDLING & STORAGE CONDITIONS:

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 should 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.