

# TECHNICAL DATA SHEET

## QUAKERCUT® 13 ES

### HEAVY-DUTY, HIGH FLASH POINT MACHINING AND BROACHING OIL

This non-chlorinated heavy-duty machining and broaching oil provides a high degree of lubrication. It is suitable for use on all grades of steel, including difficult-to-machine high-nickel alloys. This product contains synthetic ester and new non-chlorinated extreme pressure technology to provide optimum performance on difficult machining operations, such as heavy duty broaching applications, allowing significant productivity gains.

#### Applications

This product is suitable for:

- Medium to Heavy Duty Machining
- Tapping
- Broaching
- Gun Drilling

#### Recommendation for Use

This product is to be used as received. It should not be diluted with any mineral spirits or other low viscosity materials. Dilution will greatly hinder performance characteristics. To clean and protect after the metal removal operation, use QUAKERCLEAN® (cleaners) and FERROCOTE® (corrosion preventives) to enhance process compatibility. This product does not contain any material which is subject to the annual reporting requirements under Section 313 of Superfund Amendments and Reauthorization Act (SARA), Title III.

QUAKERCUT® 013 ES is available in drums (54 gal/390 lbs) or totes (320 gal/2,314 lbs). All containers are filled to volume by weight. This product has a shelf life of 12 months. Like most chemicals, it should be stored out of direct sunlight in temperatures between 40°F - 100°F (4°C - 40°C). If the product becomes frozen, thaw and mix well before use.

All reasonable care has been taken to ensure this publication is accurate upon issue. Such information may be affected by changes subsequent to issue. This Technical Data Sheet is to be used solely for this product. Prior to any use, consult the Safety Data Sheet (SDS) for information on hazard risks and product use parameters. All liability and all warranties express or implied are hereby excluded as to product performance results, the accuracy of these data including any warranty of merchantability or fitness for any purpose. 016650

#### The Benefits

- Unique blend of oils and synthetic ester lubricants increases tool life and improves finish without chlorine
- Mild odor is preferred by operators. This product has a low tendency to form mist, even in high-speed grinding operations
- Non-staining fluid provides excellent thin film anticorrosion protection
- Unique base oil technology offers increased flashpoint for improvement to plant safety
- Thin, oily residue is non-tacky and easily removed by conventional alkaline or emulsion cleaners

#### 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.

#### Properties

| PROPERTY                  | TYPICAL VALUE          | UNIT      |
|---------------------------|------------------------|-----------|
| Appearance                | Clear amber            |           |
| Density at 60°F           | 7.33                   | lbs/gal   |
| Flash point via COC       | 364   185              | F°   C°   |
| Viscosity at 100°F (40°C) | 72   13                | SUS   cSt |
| Odor                      | Bland                  |           |
| Neat pH                   | N/A, Not water soluble |           |



# TECHNICAL DATA SHEET

## CUT-MAX® BR 30

### NEAT CUTTING OIL FOR BROACHING AND SEVERE MACHINING

CUT-MAX® BR 30 is based on hydro treated mineral oil with low aromatic content. A combination of polar, extreme pressure and anti-wear additives provide the oil with high load carrying properties. The oil provides good surface finish of the machined work pieces.

CUT-MAX® BR 30 is free from Chlorine.

#### Applications

CUT-MAX® BR 30 is used for broaching steel up to 1000 N/mm<sup>2</sup> and at speeds up to 60 m/min. The specially developed additive package ensures high tool life, superior to chlorine-containing products.

CUT-MAX® BR 30 gives high tool life when auto-lathe-machining small quenched and drawn steel components.

#### Recommendation for use

Prior to making any fresh fill, we highly recommend full cleaning of all system components which will be in contact with the oil.

Advice for keeping optimal oil performance and longer oil sump life:

- Avoid water contamination.
- Minimize pollution with aqueous metalworking coolants or cleaners.
- Minimize pollution with tramp-oil (hydraulic oils, slideway oils, etc.....).
- Use proper filtration unit to remove swarf and chips.
- Avoid overheating.

\*Please consult a Quaker Houghton representative for any additional information.

#### Benefits

- Reduced cost : improved tool life due to high EP power
- Reduced cost : higher production rates due to strong lubricity
- Reduced cost : less energy consumption due to high EP and lubricity
- Reduced cost : less disposal due to high oxidation stability

#### Health, Safety and Handling

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This product has a recommended shelf life of: 24 months

#### Properties

| PROPERTY            | TYPICAL VALUE | UNIT                      |
|---------------------|---------------|---------------------------|
| Appearance / Colour | Clear Amber   | [-]                       |
| Viscosity           | 30            | mm <sup>2</sup> /s @ 40°C |
| Density             | 920           | kg/m <sup>3</sup> @ 20°C  |
| Flash point (COC)   | 180           | °C                        |
| Pour point          | -9            | °C                        |
| Copper corrosion    | 4a            | ASTM D 130                |

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# TECHNICAL DATA SHEET

## GARIA® 621 CM-36 HIGH QUALITY ACTIVE SULFUR CUTTING OIL

GARIA® 621 CM-36 contains unique synergistic extreme pressure additive systems that readily react at the chip-tool interface to form extremely effective boundary lubricating films which reduce frictional heat and prevent metal-to-metal contact of the tool and workpiece.

GARIA® 621 CM-36 contains fatty oil Additives which increase the lubricity and provides better surface finish of workpieces. GARIA® 621 CM-36 possesses excellent anti-wear and anti-weld properties to maximize tool life and minimize machine down-time.

### Applications

GARIA® 621 CM-36 is light colored, anti-mist, active sulfur cutting oils designed for use in moderate to severe machining operations.

**Steels:** High and low alloyed, treated, stainless, heat resistant, austenitic, low carbon content.

### Recommendation For Use

GARIA® 621 CM-36 is used neat as supplied.

### Benefits

- Light transparent color and low odor properties
- Excellent lubricity and extreme pressure properties
- Chip-to-tool welding (built-up edge) minimization
- Increased tool life
- Closer tolerances
- Better finish on parts
- Corrosion/rust protection of part and machine
- Low smoke/mist tendencies

### Health, Safety and Handling

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### Properties

| PROPERTY          | TYPICAL VALUE | UNIT |
|-------------------|---------------|------|
| Appearance        | Yellow Liquid |      |
| Specific Gravity  | 0.89          |      |
| Viscosity at 40°C | 36            | cSt  |
| Active Sulfur     | Yes           |      |
| Flash point       | 177           | °C   |

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# TECHNICAL DATA SHEET

## QUAKERCUT® 020 EP MINERAL OIL FREE NEAT CUTTING OIL

QUAKERCUT® 020 EP is a superior performance neat cutting oil based on advanced ester technology from renewable raw materials. It is designed for aggressive metalworking operations in multi-metal applications.

### Applications

High polar additives provide optimal wetting and lubricating properties ensuring high surface finish quality and improved tool life. The product is intended to be used neat.

### Health and Safety Benefits

Mineral oil based cutting oils with viscosities below 20 cSt must be classified by law as "May be fatal if swallowed or enters airways" and must show the GHS warning pictogram on the SDS and product label (Aspiration Hazard). The 100% natural, renewable esters used in the QUAKERCUT® XP and EP series are totally free of the Aspiration Hazard warning. Likewise, the much higher flash point of these natural esters also provides a higher level of safety and worker health benefits.

| OPERATIONS         |   | MATERIALS            |   |
|--------------------|---|----------------------|---|
| Turning            | ● | Cast-Iron            | ● |
| Milling            | ● | Steel                | ● |
| Drilling           | ● | High alloy steel     | ● |
| Deep hole drilling | ● | Stainless steel      | ● |
| Tapping-threading  | ● | Aluminum alloys      | ● |
| Reaming            | ● | Aero Aluminum alloys | ● |
| Broaching          | ○ | Copper alloys        | ● |
| Sawing             | ○ | Titanium             | ● |
| Gear Hobbing       | ● |                      |   |
| Grinding           | ○ |                      |   |

● = Main Application    ○ = Possible Application

### Benefits

- Mineral oil free neat oil technology, sourced from renewable resources
- Long tool life resulting in increased productivity
- Higher flashpoint (410°F) than typical mineral oil based products for improved plant safety
- Low consumption and low mist

### Health, Safety and Handling

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### Properties

| PROPERTY            | TYPICAL VALUE | UNIT    |
|---------------------|---------------|---------|
| Appearance          | Clear Amber   |         |
| Density at 15°C     | 7.56          | lbs/gal |
| Pour Point          | -3            | °C      |
| Flash Point via COC | 210   410     | °C   °F |
| Copper Corrosion    | 1a            |         |
| Viscosity at 40°C   | 21            | cSt     |



# QUAKERCUT® 020 EP

## MINERAL OIL FREE NEAT CUTTING OIL

### Fluid Maintenance

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Prior to making any fresh system charge, Quaker Houghton highly recommends full cleaning of all system components which will be in contact with the QUAKERCUT® 020 EP.

Advice for keeping optimal product performance and extend sump life:

- Avoid water contamination
- Minimize contamination with aqueous metalworking coolants and cleaners
- Minimize contamination with tramp oils
- Use/maintain proper filtration to remove swarf and chips

Please consult a Quaker Houghton representative for any additional information.

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# TECHNICAL DATA SHEET

## DRAWSOL® WM 2800 WATER SOLUBLE DRAWING COMPOUND

DRAWSOL® WM 2800 is a heavy duty water soluble drawing compound that contains highly refined petroleum oils, extreme pressure agents, fatty lubricants and rust inhibitors to handle a wide variety of heavy duty drawing and stamping operations.

### Applications

DRAWSOL® WM 2800 may be used as received for difficult deep draws on heavy gauge steel or tough alloys.

DRAWSOL® WM 2800 may also be cut back with water for use on routine press operations ranging from heavy gauge drawing to medium stamping. The severity of the operation will dictate the appropriate dilution to use.

### Recommendations for Use

DRAWSOL® WM 2800 has a high viscosity, making it an excellent choice in operations requiring carry-through to multiple stages.

### Benefits

- Water soluble with excellent lubrication package for improved tool and die life
- Good corrosion package allows parts to be free of corrosion during storage
- Water soluble formulation allows for easily cleaned parts and clean running operation

### Health, Safety and Handling

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### Properties

| PROPERTY                        | TYPICAL VALUE     | UNIT |
|---------------------------------|-------------------|------|
| Viscosity at 40°C               | 420-520           | cSt  |
| Appearance                      | Clear brown fluid |      |
| Odor                            | Mild              |      |
| pH (10% dilution)               | 8.5-9..2          |      |
| Specific Gravity at 15°C (60°F) | 1.12              |      |

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