



## Gulf Emulsil HD

### *Heavy-duty Soluble Cutting Oil*

#### Product Description

**Gulf Emulsil HD** is heavy duty emulsifiable metalworking fluids fortified with extreme pressure additives for heavy duty machining operations of ferrous and non-ferrous metals. It is formulated with highly refined base oils and carefully selected emulsifier and corrosion protection additives. Gulf Emulsil HD imparts high degree of tool protection and better surface finish of machined surfaces even in arduous machining operations.

#### Features & Associated Benefits

Features	Associated Benefits
Additized with EP additives	Excellent tool life, less number of breakdowns, improved surface finish.
Stable Emulsion	Longer sump life, lesser down-time, cost saving
High degree of lubricity	Energy saving, extended tool life, faster machining operation
Excellent Rust protection	Longer life of machine-tools and work-pieces, reduced rejections
Resistance to microbial growth	Longer sump life, acceptability to operators

#### Applications & Recommended Concentrations

Applications	Concentrations
Finishing operations (Internal & External Grinding)	3-4%
General machining (Turning, Chamfering, Counter-sinking)	4-6%
Heavy duty machining (Reaming, Tapping, Broaching, Thread Grinding)	8-13%

#### Specifications & Typical Properties

Specification	IS 1115-98 (Reaffirmed March 2002)	
<b>Typical Properties</b>		
Test Parameters	ASTM Method	Typical Values
Emulsion Type		Milky
Kinematic Viscosity at 40°C, cSt	D 445	25.7
Flash Point, °C, COC	D 92	175
Density @ 15 °C Kg/l	D 1298	0.8919
pH (5% emulsion in 200 ppm Hard Water)		8.5
Cast Iron Corrosion test (5% emulsion in 400 ppm Hard Water)	IS :1115 Annexure A	Passes
Emulsion stability	IS: 1448	Passes



## Additional Information

### To get the optimum results

- Always add oil to the water in specified concentration. Never add water to the oil.
- Use clean container for preparation of emulsion preferably of non-galvanized materials
- Optimum pH of the emulsion should be within the range of 8.7 and 9.3
- Bacterial Count of emulsion should be controlled below  $10^5$  colony forming unit/ml.
- Fungal concentration of emulsion should be restricted to 1000 organism/ml.
- Conductivity of emulsion should not exceed 4 milliSiemens/cm

### Metal Compatibility

Ferrous Metals	Yes	Titanium	No
Yellow Metals	Yes	Magnesium	No
Aluminum	Yes		

### Water quality for optimum life cutting fluid

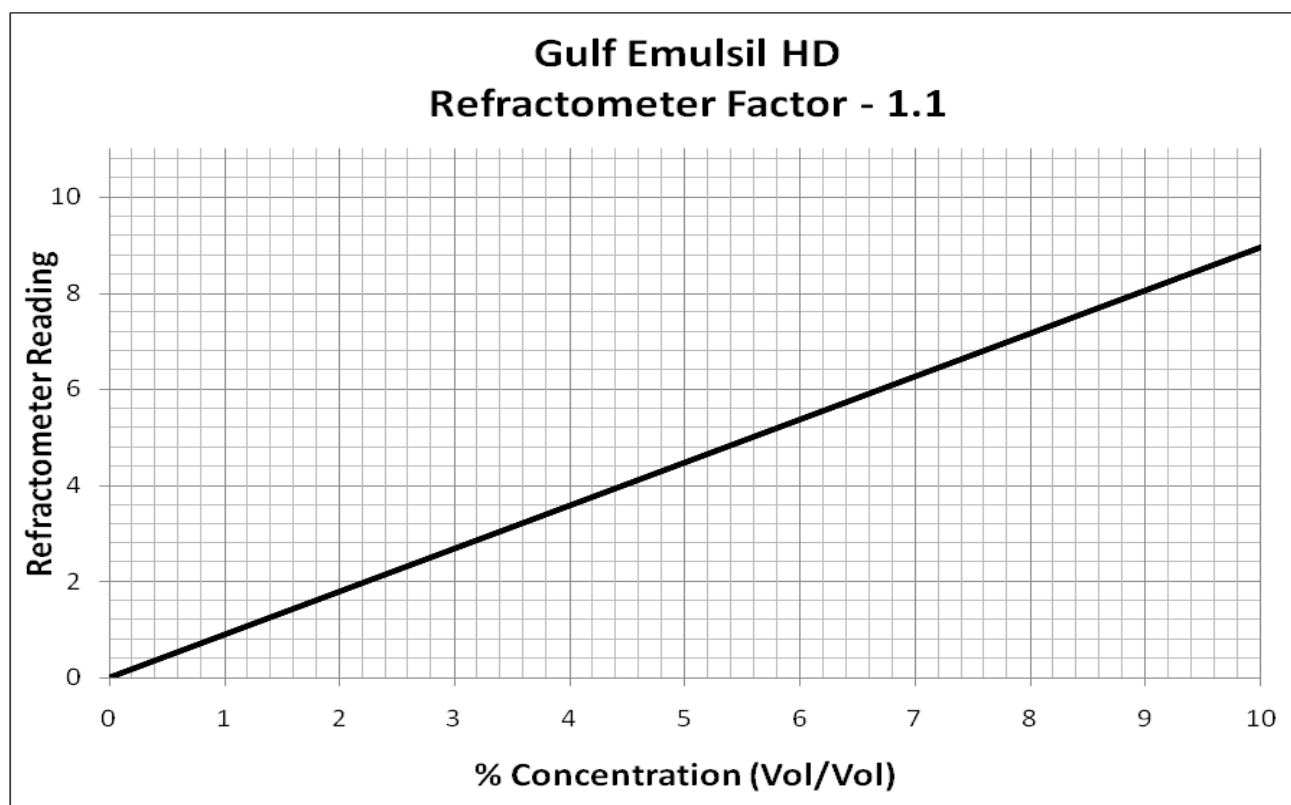
Water Hardness	Should range between 80 to 125 ppM of $\text{CaCO}_3$
Sulphate Ions	100 ppM maximum
Chloride Ions	50 ppM maximum
Phosphate Ions	30 ppM maximum

Properties mentioned above are typical only and minor variations, which do not affect the product performances, are to be expected in normal manufacturing. The above information is based on past history of the grade only and must not be construed as a guarantee of performance. Follow equipment manufacturer's recommendations for performance level and viscosity grade. The Material Safety Data Sheet for this product is available from your nearest Gulf Distributor.

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### Top-up procedure to maintain specified concentration

- Observe refractometer reading of emulsion in the system following the standard operating procedure of using refractometer.
- Find out the concentration of emulsion in percentage (Vol/Vol) by reading through the above graph corresponding to Refractometer reading.
- Find out the fraction concentration as
$$t' = \{\text{Concentration of emulsion in percentage (Vol/Vol)}\}/100$$
- Find out the amount of quantity of oil to be added in liter as
$$q = \{[(t-t')*V]/(1-t)\}$$
where  $t$  = specified fraction concentration = {Specified concentration in percentage (Vol/Vol) /100}  
 $V$  = Volume of sump in liter

### Handling & Storage guidelines

- Refer Safety Data Sheets for Health and Safety related information.
- Used product to be disposed by referring to applicable statutory guidelines.
- Store preferably in in-door condition.
- Under normal storage conditions, the product should be consumed within 1 year for optimum performance.

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