

Technical Tip #146 – Application of Metal Cutting Fluids

1.0 Benefits of Cutting Fluids

- 1.1 Increased productivity
- 1.2 Improved surface finish
- 1.3 Leaner working conditions
- 1.4 Longer tool life

2.0 Types of Cutting Fluids and Their Components

2.1 Straight Oils

- 2.1.1 Mineral oil
- 2.1.2 Lubricants
- 2.1.3 Boundary lubricants
- 2.1.4 Anti-mist agents

2.2 Soluble Oils

- 2.2.1 Mineral oil
- 2.2.2 Emulsifiers
- 2.2.3 Coupling agents
- 2.2.4 Lubricant package
- 2.2.5 Biocides
- 2.2.6 Antifoams

2.3 Semi-Synthetic

- 2.3.1 Mineral oil
- 2.3.2 Emulsifiers
- 2.3.3 Lubricant package
- 2.3.4 Rust preventative
- 2.3.5 Buffers
- 2.3.6 Biocides
- 2.3.7 Water
- 2.3.8 Antifoams

2.4 Synthetics

- 2.4.1 Wetting agents
- 2.4.2 Lubricant package
- 2.4.3 Soaps
- 2.4.4 Rust preventative
- 2.4.5 Biocides
- 2.4.6 Water

3.0 Basic Roles of Cutting Fluids

- 3.1 Cooling
- 3.2 Lubrication
- 3.3 Tool life performance assistance
- 3.4 Wash action and chip removal from the work area
- 3.5 Corrosion protection for both the machine tools and workpiece
- 3.6 Cleanliness of machine surfaces