

properties, and usually give a better tool-life and finish.

#### **Blends of mineral oil and chlorinated paraffin\*.**

Chlorine acts more readily than sulphur as an EP agent since it reacts at lower temperatures. However, it is not as effective as sulphur under more extreme conditions, although shortcomings can be overcome by using oils containing higher levels of chlorine, such in the machining, and particularly broaching, of nimonics and nickel alloys.

#### **Blends of mineral oil, chlorinated paraffin and sulphurised fatty oil\*.**

Such products not only combine the best properties of chlorinated paraffin and sulphurised fatty oil, but the two types of additive can behave synergistically providing even better performance than could be expected.

They can accordingly be used for a wide range of materials and operations.

#### **Blends of mineral oil and chloro-fatty oils\*.**

Chloro-fatty oils, produced by combining chlorine with a synthetic fatty acid ester, are suitable for machining a wide range of materials and are non-staining to both ferrous and non-ferrous metals. Blends of mineral oil, chloro-fatty oil and sulphurised fatty oil. Again, these are suitable for a wide range of materials and operations.

#### **Blends of mineral oil and sulpho-chlorinated fatty oil\*.**

Oils of this type are suitable for the machining of the toughest metals such as some of the stainless steels and heat-resistant alloys

*\* The use of chlorinated oils is gradually being phased out for environmental reasons.*

*The shorter-chain chlorinated paraffins are known to be toxic to marine life. The presence of any chlorine during swarf recovery operations could possibly give rise to the formation of toxic dioxins.*

#### **USE, CARE AND MAINTENANCE OF NEAT CUTTING OILS.**

Whilst neat cutting oils are not as sensitive to storage conditions as the water-mix variety, those containing fatty oils or compounds should not be stored under very cold conditions, otherwise there is a danger of solidification and separation of the fatty constituents.

Neat oils should be maintained at a bulk temperature of some 20°C during use to obtain maximum cooling benefit, since mineral oils are not as effective as water-mix fluids at dispersing heat due to their relatively lower specific heat. Maintaining neat oils at this low temperature also minimizes oxidation and fuming.

#### **FLUID RECONDITIONING, RECLAMATION AND DISPOSAL.**

During use the additive contents of the fluid may become depleted, also a build-up of contaminants such as swarf, hydraulic fluids and water may occur. The fluid may be restored to its original condition by 'laundering' or 're-conditioning' by contractors.

Laundering would normally include a settling, filtration or centrifugation stage to remove coarse solids and water, followed by fine filtration to remove the finer particles. The oil is then analysed, and any additive depletion is rectified before returning to use.

Re-refining (regeneration) is a more comprehensive process used for more badly contaminated oils, where the used oil is stripped of as much contaminating material as possible, then subjected to a comprehensive re-refining process, including vacuum distillation, to recover the mineral base oil.

Neat oils considered unfit for further use may be downgraded for less severe applications, or disposed of in accordance with local or national regulations. Any oils suspected to contain residual chlorine will require special attention during disposal, and the advice of a specialist waste contract should be sought.

#### **Useful Reference Literature**

HSE: Metal Working Fluid Good Practice Manual, an HSE Guide due for publication September 2002

HSE publications may be obtained by mail order from HSE Books. PO Box 1999, Sudbury, Suffolk CO10 6FS

IP: Code of Practice for Metalworking Fluids, Institute of Petroleum, 61 New Cavendish Street, London W1M 8AR.

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# Lubrication

Neat  
Cutting Oils  
Fact Sheet



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