

Lubrication

Neat Cutting Oils Fact Sheet

Lubrication

*An important message
for buyers and users*

CORRECT LUBRICATION -

- MAXIMISES PRODUCTION RATES
- MINIMISES OPERATING COSTS
- REDUCES MAINTENANCE
- EXTENDS MACHINE & TOOL LIFE

*The purpose of this leaflet is to help you
select the correct lubricant for your
application.*

BLF**BLF**

CHOICE OF FLUID TYPE

Water-mix fluids are widely used in general machining operations on account of their low cost and cooling capability.

Because of their comparatively high cost, the use of neat oils, the subject of this Fact Sheet, is confined to the more severe cutting operations or in situations where a particularly high surface finish is required.

MWF HISTORY

The use of Metalworking Fluids escalated at the beginning of the 20th century due to the creation of new industries, e.g. the automotive industry, and also due to the increased mechanisation of military equipment. The birth of modern neat oils came about as a result of the need to simultaneously meet high machining performance and production rates.

The properties of the early simple oils were progressively enhanced over many years by the incorporation of additives of increasing variety and sophistication.



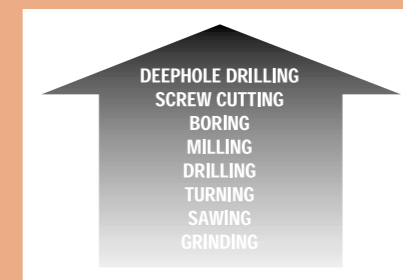
SELECTING THE RIGHT FLUID

The following questions are key to selecting the right type of fluid for the operation.

What type of material is being machined?

What machining operation is involved?

What other specific requirements are there, e.g. surface finish, freedom from staining?



The above diagram gives an indication of the relative difficulty of each machining operation. At the bottom of the chart is the grinding operation, which, in the majority of its variants, requires cooling with little or no lubrication. Sawing, turning, milling and drilling all require some lubrication as well as cooling and may benefit from the presence of lubricity/extreme pressure additives especially with tough materials or when long tool life is required. The remainder of the operations will all require lubricity and/or extreme pressure additives to a greater or lesser extent dependent on material type.

A whole range of factors will influence the selection of the correct cutting oil, however, the four key points described above would be common to any selection process and a good understanding of these influences will help achieve the optimum compromise in fluid

selection. The types of neat oils available are:

Mineral cutting oil (with no additives)

Suitable for low severity operations involving mild steel, brass and light alloys.

Fatty oils

Oils derived from natural sources, e.g. rapeseed oil, lard oil, are not now in general use due to their short working life and tendency to fume and give rise to rancid odours.

Blends of mineral oil and fatty oil

Can be used as mineral oils as above, but can give a better finish than straight mineral oils, particularly when machining mild steel, copper, aluminium and the harder types of brass.

Blends of mineral oil and sulphurised fatty oil

Products such as these, containing 'inactive' sulphur, are suitable for more arduous machining operations, but do not readily stain copper-based metals.

Blends of mineral oil, sulphurised fatty oil and containing elemental sulphur.

These products, containing up to 0.5% free, or 'active', sulphur, are suitable for machining the tougher ferrous alloys, but will cause staining of yellow metals.

Blends of mineral oil and sulphurised mineral oil.

These products, which either contain up to either 0.5% or 2% sulphur, depending on the addition temperature, have good EP properties, but again will stain yellow metals. Though oils blends containing sulphurised fatty oils, have better 'oiliness' and anti-friction